Volume 5, Issue 2, Summer 2012

JCR

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In This Issue

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September 25-28, 2012 – Brussels, Belgium

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JOURNAL OF CYBERTHERAPY & REHABILITATION

Volume 5, Issue 2, Summer 2012

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EDITORIAL

Welcome to the Summer 2012 issue of the Journal of CyberTherapy & Rehabilitation (JCR). As you know, JCR is one of the two official journals of the International Association of CyberPsychology, Training & Rehabilitation (iACToR). Now in its 17th year, the annual international CyberPsychology & CyberTherapy Conference (CYBER 17) is the official conference of iACToR. The CyberPsychology, Behavior, & Social Networking Journal (CYBER), CyberTherapy & Rehabilitation (C&R) Magazine, and JCR, form to create our Combined Communications Platform. The journals, conference, magazine, and association combine into one powerful platform to address previous information deficits in the utilization of advanced technologies in healthcare which strives to speak with a united voice to inform and educate stakeholders about the uses of technologies in healthcare, as well as how technologies are impacting behavior and society.

This year the Interactive Media Institute, in collaboration with the Virtual Reality Medical Institute, is organizing the International Association of CyberPsychology, Training, & Rehabilitation's (iACToR) 17th Annual CyberPsychology & CyberTherapy Conference (CYBER17), scheduled for September 25-28, 2012 at the European Parlimanet in Brussels.

The Annual CyberPsychology & CyberTherapy Conference began as a symposium that featured presentations dealing mostly with conceptual matters and future possibilities at the Medicine Meets Virtual Reality Conference. CYBER17 has now grown to a full-scale conference with presentations that demonstrate controlled clinical trials with unique applications of cutting edge technologies that improve the access and increase the quality of healthcare.

CYBER17's focus areas include:

1. The Impact of Technologies as Tools

CYBER17 will continue its examination of the exciting applications of advanced technologies being used in training, therapy, rehabilitation, and education for the improvement of the quality and availability of healthcare for people around the globe.

2. The Influence of New Technologies

CYBER17 will further its investigation into how new technologies are influencing behavior and society through the use of positive technology, healthy ageing and well-being.

3. The Imprint of Social Networking

CYBER17 will embrace, as it did in 2011, the exploration of social networking tools on individual behavior and societal relations.

4. The Introduction of New Technologies and New Terms

CYBER17 will study the psychological aspects of new areas influenced by technology such as cyberfashion, cyberadvertising and cyberstalking.

I would like to take this opportunity to thank all those who are helping to make this year's conference possible through their tireless energy and drive – this year's Scientific Chairs, Professors Rosa Marie Baños, Willem-Paul Brinkman and Giuseppe Riva; Exhibit Chairs Professors Evangelos Bekiaris and Luciano Gamberini; Workshop Chair Professor Stéphane Bouchard; Cyberarium Chairs Professors Mariano Alcañiz and Andrea Gaggioli; and Website Chair Professor Sun Kim. Many thanks to the Scientific Committee, made up of prominent researchers from around the world, as well as all of the presenters and attendees. Finally, my gratitude to James Cullen, Chelsie Boyd, Tanisha Croad and Pierre Schifflers for overseeing the Conference Coordination, to Emily Butcher for editing related materials, and to the teams at Interactive Media Institute, Virtual Reality Medical Center, and Virtual Realty Medical Institute for their time and contributions to all facets of the conference.

To our sponsors and supporters, who continue to support our vision and help make it a reality, a warm and heartfelt thank you – Brussels Capital Region, Engineering Systems Technologies GmbH & Co. KG, the European Commission, Hanyang University, International Association of CyberPsychology, Training, & Rehabilitation (iACToR), Interactive Media Institute (IMI), INTERSTRESS, ISfTeH, Istituto Auxologico Italiano, Mary Ann Liebert, Inc. Publishers, National Institute on Drug Abuse (NIDA), Université du Québec en Outaouais (UQO), the Virtual Reality Medical Center (VRMC), the Virtual Reality Medical Institute (VRMI) and Visit Brussels. As integral parts of our Combined Communications Platform, the CyberPsychology & CyberTherapy Conference series will continue to work together with iACToR, JCR, and C&R to inform and educate industry, academia, and government officials and the general public on the explosive growth of advanced technologies for therapy, training, education, prevention and rehabilitation.

As in previous conferences, this year's conference will be hosting an interactive exhibit area, the Cyberarium, which allows conference attendees and members of the press to try new technologies firsthand. To recognize outstanding achievements by students and new researchers, as well as lifetime achievement for a senior researcher, we will also be hosting awards during the conference and announcing the 2012-2013 iACToR officers during the General Assembly. Pre-conference workshops will focus on advanced topics including Brain Computer Interfaces, VR for cognitive assessment and rehabilitation and finally VR treatment manuals for clinical applications.

As we approach CYBER17 with excitement, we begin too to look toward next year's conference, CyberPsychology & CyberTherapy 18, to be held in June 2013. Thank you again for your commitment to the evolution of healthcare!

Brenda K. Wiederhold, Ph.D., MBA, BCIA
Editor-in-Chief,
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Wounds of War

A Subseries of the NATO Science for Peace and Security Series - E: Human and Societal Dynamics

Latest volumes:

Pain Syndromes – From Recruitment to Returning Troops
Wounds of War IV

Vol. 91: NATO Science for Peace and Security Series - E: Human and Societal Dynamics
Editor: B.K. Wiederhold
July 2012, 252 pp., hardcover
ISBN: 978-1-60750-985-1
Price: €120 / US$174

It has been shown that those who have served in both combat missions and peacekeeping operations are at increased risk for pain syndromes. Research suggests that this may result from their "wounds of war." Some wounds may be "invisible," such as depression, stress, and chronic pain, while others, such as physical disabilities, are more obvious. In October 2011, twenty-seven scientists and representatives from NATO and partner countries met in Südkärnten, Austria for a three-day NATO Advanced Research Workshop entitled "Wounds of War: Pain Syndromes – From Recruitment to Returning Troops."

The aim of this publication, which presents papers from that workshop, is to critically assess the existing knowledge and to identify directions for future actions. The book addresses four key questions:
1. Vulnerability to Pain syndromes: Are certain types of people at a higher risk for pain syndromes (background, ethnicity, childhood trauma, etc.)?
2. Diagnosis and Assessment issues of Pain Syndromes: Which methods are used to diagnose and assess pain?
3. Treatment of Pain Syndromes: What are the latest treatment and therapy opportunities for soldiers who experience pain syndromes?
4. Clinical Updates on Pain Syndromes: What can we learn from recent clinical updates on pain syndromes?

Coping with Blast-Related Traumatic Brain Injury in Returning Troops
Wounds of War III

Vol. 86 : NATO Science for Peace and Security Series - E: Human and Societal Dynamics
Editor: B.K. Wiederhold
November 2011, 224 pp., hardcover
ISBN: 978-1-60750-798-3
Price: €120 / US$174

It has been shown that those who have served in both combat missions and peacekeeping operations are at increased risk for Traumatic Brain Injury (TBI). Research suggests that this may result from their "wounds of war". Some wounds may be "invisible", such as depression, stress, and chronic pain, while others, such as physical disabilities, are more obvious. In February 2011, 35 scientists and representatives from NATO and Partner countries met in Vienna, Austria for a three-day NATO Advanced Research Workshop entitled "Wounds of War: Coping with Blast Related Traumatic Brain Injury in Returning Troops".

The aim of this publication, which presents papers from that workshop, is to critically assess the existing knowledge and to identify directions for future actions. The book addresses four key questions:
1. Characterization of TBI: Which characteristics make up and help to classify TBI?
2. Diagnosis and Assessment issues Surrounding TBI: Which methods are used to diagnose and assess TBI?
3. Treatment of TBI: What are the latest treatment and therapy opportunities for soldiers after they have been diagnosed with TBI?
4. Quality of Life: How are the lives of TBI patients affected and in what ways can their quality of life be increased?

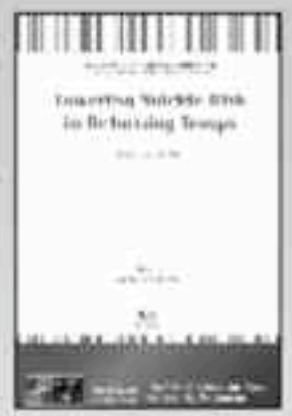
Coping with Posttraumatic Stress Disorder in Returning Troops
Wounds of War II

Vol. 68 : NATO Science for Peace and Security Series - E: Human and Societal Dynamics
Editor: B.K. Wiederhold
August 2010, 312 pp., hardcover
ISBN: 978-1-60750-570-9
Price: €135 / US$196

Military post traumatic stress disorder (PTSD) is a common and disabling consequence of war, terrorism and natural disasters which presents an increasing problem for service men and women around the world. It has been shown that those who serve in both combat missions and peacekeeping operations are at greater risk of developing PTSD as a result of the 'wounds of war'. These wounds may take the obvious form of physical disabilities, but 'invisible' wounds, such as depression, anxiety, stress and chronic pain may also lead to an increased risk of PTSD. This book presents full papers, focused on the key presentations from the NATO Advanced Research Workshop, Wounds of War: Coping with Posttraumatic Stress in Returning Troops, held in October 2009. These papers critically assess existing knowledge in the field and identify directions for future action. The book addresses the five key issues of PTSD: vulnerability, diagnosis and assessment, prevention, treatment and associated disorders. While PTSD may be an invisible illness, its effects are certainly not invisible. Countries must work together to develop prevention and treatment strategies which ensure that service men and women everywhere are able to assimilate back into society to lead productive lives and enjoy the freedom they fought to protect. The purpose of this book is to contribute to this process.

Lowering Suicide Risk in Returning Troops
Wounds of War

Vol. 42: NATO Science For Peace and Security Series - E: Human and Societal Dynamics
Editor: B.K. Wiederhold
August 2008, 224 pp., hardcover
ISBN: 978-1-58603-889-2
Price: €115 / US$167



Lowering Suicide Risk in Returning Troops: Wounds of War discusses the topic of increased suicide risk in service men and women around the world. Research has shown that those who have served in both combat missions and peacekeeping operations are at an increased risk for suicide. Research suggests that this may result from their 'wounds of war'. Some wounds may be more 'invisible', such as depression, posttraumatic stress disorder, and chronic pain, while others are more visibly apparent, such as physical disabilities. Whatever the wound, however, it seems they may all lead to an increased risk of suicide. In this book, many aspects of military suicide and how to effectively deal with this issue are discussed. Specifically, some of the questions raised are: How do we detect those who are vulnerable to increased suicide risk, possibly due to a combination of genetics and past environmental insults? How do we most appropriately assess for increased risk? Once detected, how do we help to decrease that risk? Are there pre-deployment training methods we can employ to help "inoculate" individuals against increased risk? Are there in-theater and post-deployment methods most appropriate for dealing with this risk?

For more information on the series, tables of content and ordering:

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Interreality in the Management and Treatment of Stress Related Disorders

The INTERSTRESS project aims to design, develop and test an advanced ICT-based solution for the assessment and treatment of psychological stress.

Objectives:

- Quantitative and objective assessment of symptoms using biosensors and behavioral analysis
- Decision support for treatment planning through data fusion and detection algorithms
- Provision of warnings and motivating feedback to improve compliance and long-term outcome

To reach these goals, INTERSTRESS will use a new e-Health concept: Interreality. What is Interreality? It is the integration of assessment and treatment within a hybrid, closed-loop empowering experience, bridging physical and virtual worlds into one seamless reality.

- Behavior in the physical world will influence the virtual world experience
- Behavior in the virtual world will influence the real world experience

These goals will be achieved through:

- 3D Shared Virtual World role-playing experiences in which users interact with one another
  - Immersive in the healthcare centre
  - Non-immersive in the home setting
- Bio and Activity Sensors (from the Real to the Virtual World)
  - Tracking of emotional/health/activity status of the user and influencing the individual's experience in the virtual world (aspect, activity, and access)
- Mobile Internet Appliances (from the Virtual to the Real world)
  - Social and individual user activity in the virtual world has a direct link with user's life through a mobile phone/PDA

Clinical use of Interreality is based on a closed-loop concept that involves the use of technology for assessing, adjusting and/or modulating the emotional regulation of the patient, his/her coping skills and appraisal of the environment based upon a comparison of the individual patient's behavioural and physiological responses with a training or performance criterion. The project will provide a proof of concept of the proposed system with clinical validation.

Project Coordinator:
Istituto Auxologico Italiano
Contact Person:
Andrea Gaggioli
email:
andrea.gaggioli@auxologico.it
Ph/fax:
+39-02-619112892

Communications Officer:
Brenda K. Wiederhold
email:
b@vrphobia.eu
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DIGITAL SOCIETAL PLATFORMS

Designing a Digital Interactive Television for Elderly People: Requirements' Identification

Anna Spagnolli[a,1], Luciano Gamberini[a], Francisco Ibanez[b], Malena Fabregat[b], Tijana Debelic[a] and Valeria Orso[a]

[a]Università degli Studi di Padova, Italy
[b]Brainstorm, Spain

[1]*Corresponding author*:
Anna Spagnolli
anna.spagnolli@unipd.it

Abstract

SeniorChannel is a European project that aims to develop an Interactive Digital Television to offer entertainment and improve the social interaction of elderly people by making them an active audience. The limitations in perception, cognition and motor abilities associated with aging must be taken into account both in designing the interface and in collecting users' requirements during desing. The specific solutions to elicit users' requirements and their results are described here.

Tackling Sensitive Issues Using a Game-based Environment: Serious Game for Relationships and Sex Education (RSE)

Katherine Brown[a,1], Sylvester Arnab[b], Julie Bayley[a], Katie Newby[a], Puja Joshi[a], Becky Judd[a], Alison Baxter[a] and Samatha Clarke[b]

[a]Applied Research Centre for Health & Lifestyle Intervention, Coventry University
[b]Serious Games Institute, Coventry University

[1]*Corresponding author*:
Katherine Brown
k.brown@coventry.ac.uk

Abstract

Experience of sexual coercion during adolescence can lead to a range of adverse psychological and physical health outcomes. Working to eliminate coercive sexual experiences for young people is therefore important for enhancing wellbeing in this population. Delivering good quality relationships and sex education (RSE) can help to achieve this aim. Engaging young people on sensitive subjects such as this can be challenging and using Serious Gaming technology may help educators and young people to overcome this. This paper describes the use of Intervention mapping (IM) in the development of a serious game on the topic of sexual coercion for RSE. IM is an iterative process that draws on stakeholder engagement and the theory and evidence base for what works, to support health improvement intervention planning. Serious game developers took the game concept plan and transformed it into an interactive game show, led by a teacher or facilitator to engage students in game play and discussion around the issue of sexual coercion. The final product known as PR:EPARe (Positive Relationships: Eliminating Coercion and Pressure in Adolescent Relationships) is currently the subject of a cluster Randomised Controlled Trial (RCT) in local schools which will assess whether change objectives relating to psychological preparedness to deal with sexual coercion has improved compared with controls. This works represents the first attempt to use IM in the development of a Serious Game and the use of Serious Gaming for RSE delivery. Stakeholders are supporting plans for sustainability of the product once RCT results are established.

Feasibility of Recruiting Peer Educators for an Online Social Networking-Based Health Intervention

Sean D. Young[a], Lauren Harrell[b], Devan Jaganath[a] Adam Carl Cohen[c] and Steve Shoptaw[a]

[a]Department of Family Medicine, David Geffen School of Medicine, UCLA, Los Angeles, CA
[b]Department of Biostatistics, School of Public Health, UCLA, Los Angeles, CA
[c]Department of Family Medicine, David Geffen School of Medicine, UCLA, Los Angeles, CA

[1]*Corresponding author*:
Sean D. Young
UCLA Department of Family Medicine
UCLA, Los Angeles CA 90024
310-794-0619 Ext. 240
sdyoung@mail.mednet.ucla.edu

Abstract

Objective: This study aims to determine the feasibility of recruiting peer leaders to deliver a community-based health inter vention using social media.

Method: We recruited sixteen African American and Latino men who have sex with men (MSM) as peer leaders for either an HIV prevention or general health intervention using social media. Inclusion criteria required that peer leaders were African American or Latino MSM health communication experts experienced using social media. To receive certification, peer leaders

attended 3 training sessions on using social media for public health. Questionnaires asking about health knowledge and comfort using social media to discuss health-related topics were provided at baseline and post-training to ensure that peer leaders were qualified post-training. Repeated measures ANOVA models and $\chi 2$ tests tested for differences in peer leader knowledge and comfort using social media pre- and post-training.

Results: After training, peer leaders were significantly more comfortable using social media to discuss sexual positions. There were no significant differences pre- and post-training on other comfort or knowledge measures, as at baseline, almost all peer leaders were already comfortable using social media.

Conclusion: Results suggest that peer leaders can be recruited who are qualified to conduct health interventions without needing additional training. The discussed training plan can further ensure that any unqualified peer leaders will be prepared after training. To our knowledge, this is the first study to suggest that peer leaders can be recruited as peer health educators to communicate using social media.

Virtual Representations of the Self: Engaging Teenagers in Emotional Regulation Strategies Learning

Maja Wrzesien[a,1], Beatriz Rey[a,c], Mariano Alcañiz[a,c], Rosa Baños[b,c], Mario Gómez Martínez[a], David Pérez-López[a], Alejandro Rodríguez Ortega[a], Paloma Rasal[b], Elena Parra Vargas[a] and Jaime Guixeres Provinciale[a]

[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universitat Politècnica de València, I3BH/LabHuman, Camino de Vera s/n, 46022 Valencia, España
[b]Universidad de Valencia, Spain
[c]Ciber, Fisiopatología de Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Spain

[1]*Corresponding author*:
Maja Wrzesien
mwrzesien@labhuman.i3bh.es

Abstract

The aim of this paper is to present digital representations of humans (i.e., avatars) that look like the self, applied to the Mental Health (MH) field. Virtual Representations of the Self (VRS) are in our opinion a tool with a great potential for engaging teenagers in emotional regulation learning. VRSs have already demonstrated their potential. Thus, the same technology can bring a lot to the MH field. This paper describes the methodology that we plan to apply. Also, the implications of such technology and future research lines are discussed.

Mindfulness Training Online for Stress Reduction: a Global Measure

Miguel Quintana[a,1]

[a]Complutense University of Madrid, Spain

[1]*Corresponding author*:
Miguel Quintana
miguelqscanarias@yahoo.es

Abstract

According to the World Heath Organization, stress-related chronic diseases are the main source of death in developed countries (WHO, 2010). Contemporary, e-mental health interventions are showing its growing potential due to the global adoption of Internet and mobile phone technology (Bashshur et al., 2011).

Mindfulness is the capability of focusing one's attention, on purpose, in the present moment and without judging (Kabat-Zinn, 1990). A significant quantity of studies have concluded that mindfulness helps to reduce physical and psychological symptoms of stress (Grossman et al., 2004, De Vibe et al., 2012) and that is a psychological skill that can be trained.

The purpose of this online research study is to gather the participants' socio-demographics as well as stress and mindfulness data during an online mindfulness-training program. Sustained attention and the state of mindfulness experienced are also tracked and stored from single meditation sessions.

Volunteers set up their own mindfulness-training program, which can last from 1 to 8 weeks, choosing from 1 to 55 minutes of daily meditation training (treatment condition).

In a pre-post program design, perceived stress (Cohen & Mermelstein, 1983) and facets of mindfulness (Baer et al., 2006) are measured to assess the effects of the program chosen by each user.

Exploratory and correlational analysis of the results will be conducted to identify the effects of stress reduction and the enhancements of mindfulness skills as they relate to the length, quality and amount of mindfulness training.

HEALTH & WELL-BEING

Virtual Reality in the Treatment of Body Image Disturbances after Bariatric Surgery: A Clinical Case

Giuseppe Riva[a,b,1], Georgina Cárdenas-López[c], Ximena Duran[c], Gonzalo M. Torres-Villalobos[d] and Andrea Gaggioli[a,c]

[a]Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano, Milan, Italy
[b]Psychology Department, Catholic University of Milan, Italy
[c]School of Psychology, National Autonomous University of Mexico. Mexico City, Mexico
[d]Obesity Surgery Clinic, Médica Sur Clinical Foundation, Mexico City, Mexico

[1]*Corresponding author*:
Giuseppe Riva
giuseppe.riva@unicatt.it

Abstract

Bariatric surgery is an operation on the stomach and/or intestines that helps patients with extreme obesity to lose weight. Even if bariatric surgery, compared with traditional obesity treatment, is more effective in reducing BMI, this approach does not achieve equal results in every patient. More, following bariatric surgery common problems are body image dissatisfaction and body disparagement: there is a significant difference between the weight loss clinicians consider successful (50% of excess weight) and the weight loss potential patients expect to achieve (at least 67% of the excess weight).

The paper discusses the possible role of virtual reality (VR) in addressing this problem within an integrated treatment approach. More, the clinical case of a female bariatric patient who experienced body dissatisfaction even after a 30% body weight loss and a 62% excess body weight loss, is presented and discussed.

Electro-Physiological Data Fusion for Stress Detection

Alejandro Riera[a,1], Aureli Soria-Frisch[a], Antón Albajes-Eizagirre[a], Pietro Cipresso[b], Carles Grau[a,c], Stephen Dunne[a] and Giulio Ruffini[a]

[a]Starlab Barcelona SL
[b]IRCCS Istituto Auxologico Italiano - Milan
[c]Universitat de Barcelona

[1]*Corresponding author*:
Alejandro Riera
alejandro.riera@starlab.es

Abstract

In this work we describe the performance evaluation of a system for stress detection. The analysed data is acquired by following an experimental protocol designed to induce cognitive stress to the participants. Several tasks were performed by the subjects for this purpose, including a Stroop Test, mathematical calculations, and a fake blood sample collection. In the second half of the experiment, 3 actors were introduced as experts in non-verbal communication in order to increase the social stress (based in the Trier Social Stress protocol). The experimental set-up included the recording of electroencephalography (EEG), facial (corrugator and zygomatic) electromyography (EMG), electrocardiography (ECG) and galvanic skin resistance (GSR). In a preliminary analysis we are able to correlate EEG features (alpha asymmetry and alpha/beta ratio using only 3 channels) with the stress level of the participants statistically (by using averages over subjects) but also on a subject to subject basis by using computational intelligence techniques reaching classification rates up to 96%. On a second step, we apply fusion techniques to the overall multi-modal feature set integrating the formerly mentioned EEG features with heart beat rate based on ECG, EMG energy, and GSR number of events. We show that the results improve significantly providing a more robust stress index in a close to real time manner. Given the achieved performance the system described in this work can be successfully applied for stress therapy when combined with virtual reality.

Psychosocial Implications of Avatar Use in Supporting Therapy of Depression

Claudia Pagliari[a,1], Maria Wolters[b], Chris Burton[a], Brian McKinstry[a], Aurora Szentagotai[c], Daniel David[c], Antoni Serrano Blanco[d], Luis Ferrini[e], Susanna Albertini[e], Joan Carlos Castro[f] and Soraya Estevez[f]

[a]Centre for Population Health Sciences, University of Edinburgh, UK
[b]University of Edinburgh, UK,
[c]Babes-Bolyai University, Romania
[d]Parc Sanitari El Prat de Llobregat, Spain
[e]FVA, Italy
[f]Fundacio i2CAT, Spain

[1]*Corresponding author*:
Claudia Pagliari
Claudia.pagliari@ed.ac.uk

Abstract

Help4Mood is a collaborative project funded under the European Commission's Framework 7 programme. It aims to de-

velop and test new methods of supporting the treatment of depression in the community. Help4Mood obtains symptom data from patients through self-reports and non-obtrusive and non-stigmatising sensors. A humanoid virtual agent (avatar) is used to engage patients, elicit self-report data, and support Cognitive Behaviour Therapy homework. The use of Avatars in supporting therapy and behaviour change interventions is relatively new and poses important questions about the value of therapeutic encounters, user engagement and expectations, and possible risks and benefits to the user.

Method: Thematic analysis of ten focus groups in three countries (UK, Spain, Romania) with patients with depression and health care professionals.

Results: Using Avatars has wide-ranging psychological and societal implications. While there is great potential for engaging patients in the treatment process, appropriate choices of avatars need to be provided. The technology needs to be introduced sensitively into the treatment process. Patient concerns about privacy and about losing access to highly valued human contact and support need to be addressed. Clinicians feared loss of time with patients and being made redundant by technology.

Conclusion: Based on this feedback, Help4Mood has been explicitly designed to support and augment therapeutic encounters. It facilitates joint ownership of the treatment process by clinician and patient, and supports planning individual sessions and long-term therapy.

Use of Internet in an Italian Clinical Sample

Caterina La Cascia[a], Filippo La Paglia[a], Antonio Franco Mano[a] and Daniele La Barbera[a]

[a]Department of Experimental Biomedicine and Clinical Neuroscience, University of Palermo, Italy

[1]*Corresponding author*:
Caterina La Cascia
erika.lacascia@unipa.it

Abstract

This study is aimed at evaluating Internet use in a psychiatric population. We used the UADI questionnaire, to investigate the degree of addictive Internet use in our sample of patients affected by various psychiatric disorders. Several psychological and psychopathological variables related to internet use, have been assessed through the five dimensions of the UADI. related to patients internet use: dissociation (DIS), Impact on real life (IMP), Experimentation (EXP), Dependence (DEP), Escape (ESC).

Designing Virtual Audiences for Fear of Public Speaking Training – An Observation Study on Realistic Nonverbal Behavior

Sandra Poeschl[a, 1] and Nicola Doering[a]

[a]Ilmenau University of Technology

[1]*Corresponding author*:
Sandra Poeschl
sandra.poeschl@tu-ilmenau.de

Abstract

Virtual Reality technology offers great possibilities for Cognitive Behavioral Therapy of fear of public speaking: Clients can be exposed to virtual fear-triggering stimuli (exposure) and are able to role-play in virtual environments, training social skills to overcome their fear. Usually, prototypical audience behavior (neutral, social and unsocial) serves as stimulus in virtual training sessions, although there is significant lack of theoretical basis on typical audience behavior. The study presented deals with the design of a realistic virtual presentation scenario. An audience (consisting of n = 18 men and women) in an undergraduate seminar was observed during three frontal lecture sessions. Behavior frequency of four nonverbal dimensions (eye contact, facial expression, gesture, and posture) was rated by means of a quantitative content analysis. Results show audience behavior patterns which seem to be typical in frontal lecture contexts, like friendly and neutral face expressions. Additionally, combined and even synchronized behavioral patterns between participants who sit next to each other (like turning to the neighbor and start talking) were registered. Data gathered serve as empirical design basis for a virtual audience to be used in virtual training applications which stimulates the experiences of the participants in a realistic manner, thereby improving presence experienced in the training application.

Exergaming for Elderly: Effects of Different Types of Game Feedback on Performance of a Balance Task

Claudine J.C. Lamoth[a,1], Rolinde Alingh[a] and Simone R. Caljouw[a]

[a]Center for Human Movement Sciences, University Medical Centre Groningen, University of Groningen, the Netherlands

[1]*Corresponding author*:
Claudine J.C. Lamoth
c.j.c.lamoth@med.umcg.nl

Abstract

Balance training to improve postural control in elderly can contribute to fall-prevention. Video games that require body

movements have the potential to improve balance. However, research about the effects of type of visual feedback (i.e. the exergame) on the quality of movement and experienced workout intensity is scarce. In this study twelve healthy older and young subjects performed anterior-posterior or lateral oscillations on a wobble board, in three conditions: no feedback (FB), real-time visual FB, real-time visual FB with a competitive game element. Elderly moved slower, less accurate and more irregular. Both FB conditions ensured a more-controlled movement technique on the wobble-board and increased experienced workout intensity. The participants enjoyed the attention demanding competitive game element, but this game did not improve balance performance more than interacting with a game that incorporated visual FB. These results show the potential of exergames with visual FB to enhance postural control.

POSITIVE TECHNOLOGY: A NEW SCIENTIFIC PARADIGM FOR A BETTER WORLD

What is Positive Technology and its Impact on CyberPsychology

Giuseppe Riva[a,b,1]

[a]Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano, Milan, Italy
[b]Psychology Department, Catholic University of Milan, Italy

[1]*Corresponding author*:
Giuseppe Riva
giuseppe.riva@unicatt.it

Abstract

The goal of this paper is to introduce and describe the "Positive Technology" approach – the scientific and applied approach to the use of technology for improving the quality of our personal experience through its structuring, augmentation and/or replacement – as a way of framing a suitable object of study in the field of cyberpsychology and human-computer interaction. Specifically, we suggest that it is possible to use technology to influence three specific features of our experience – affective quality, engagement/actualization and connectedness – that serve to promote adaptive behaviors and positive functioning. In this framework, positive technologies are classified according to their effects on a specific feature of personal experience. More, for each level we have identified critical variables that can be manipulated to guide the design and development of positive technologies.

A Brief Review of Positive Technology in Europe and the USA

Brenda Wiederhold[a,b,1]

[a]Virtual Reality Medical Institute, Brussels, Belgium
[b]Interactive Media Institute, San Diego, California, USA

[1]*Corresponding author*:
Brenda Wiederhold
b@vrphobia.eu

Abstract

The aim of this paper is to demonstrate the potential of positive technology to productively and positively transform the mental health of European and American citizens in the modern era. This work will describe three aspects – hedonic, eudaimonic, and social/interpersonal – of these technologies. We approach them with guarded optimism, as all of them seek to improve our lives through various techniques. After exploring the relevant technologies, this piece will then examine the future for research within this domain.

Advances in the Positive Technology Field

Cristina Botella[a,1]

[a]Universitat Jaume I

[1]*Corresponding author*:
Cristina Botella
botella@uji.es

Abstract

The goal of this work is to delimit and describe named Positive Technology combines the objectives of Positive Psychology with enhancements of Information and Communication Technologies (ICTs) in order to transform our personal experience for building new and enduring personal strengths. This symposium describes existing Positive Technologies, classified according to their objectives: hedonic (use ICTs to induce positive and pleasant experiences); eudaimonic (systems designed to support individuals in reaching resilience); and social/interpersonal (technologies that seek to improve the connectedness between individuals, groups, and organizations). The symposium concludes with a discussion about future developments in this emerging field.

Comparing Quality of Experience in Real and Virtual Environments: Some Suggestions for the Development of Positive Technologies

Andrea Gaggioli[a,1]

[a]Istituto Auxologico Italiano

[1]*Corresponding author*:
Andrea Gaggioli
andrea.gaggioli@unicatt.it

Abstract

What does one feel when one uses virtual reality? How does this experience differ from the experience associated with "real life" activities and situations? To answer these questions, we used the Experience Sampling Method (ESM), a procedure that allows researchers to investigate the daily fluctuations in the quality of experience through on-line self reports that participants fill out during daily life. Findings showed that virtual experience is characterized by a specific configuration, which comprises significantly positive values for affective and cognitive components. In particular, positive scores of Mood suggest that participants perceived VR as an intrinsically pleasurable activity, while positive values of Engagement indicate that the use of VR and the experimental task provided valid opportunities for action and high skill investment. Furthermore, results showed that virtual experience is associated with Flow, a state of consciousness characterized by narrowed focus of attention, deep concentration, positive affect and intrinsic reward. Implications for VR research and practice are discussed.

EARTH of Wellbeing: A Place to Live Positive Emotions

Rosa Baños[a,b,1], Cristina Botella[a,c], Ernestina Etchemendy[a,b] and Luis Farfalini[c]

[a]CIBER de Fisiopatología de la Obesidad y Nutrición (CIBEROBN)
[b]Universidad de Valencia (Spain)
[c]Universidad Jaume I (Spain)

[1]*Corresponding author*:
Rosa Baños[a]
banos@uv.es

Abstract

EARTH of Wellbeing is a technological application to induce and train positive emotions and enhance different psychological strengths. The system contains 3 modules of activities: Park of Wellbeing, Wellbeing in the Nature and Book of Life. The objective of this paper is to describe the system and to offer data about its efficacy to induce positive affect in a sample of 30 participants who use EARTH three times a week along one month. This is a work in progress.

NEW TRENDS IN ADDICTION RESEARCH

Nicotine Craving: ERPs Correlates After VR Exposure to Smoking Cues

Pedro Gamito[a,1], Jorge Oliveira[a], André Baptista[a], Diogo Morais[a], Tomaz Saraiva[a], Pedro Rosa[a,b], Nuno Santos[a], Fábio Soares[a], Catarina Sottomayor[a] and Filipa Barata[a]

[a]Faculty of Psychology. CEPCA. University Lusófona of Humanities and Technologies
[b]CIS/ISCTE-Instituto Universitário de Lisboa

[1]*Corresponding author*:
Pedro Gamito
pedro.gamito@ulusofona.pt

Abstract

Even though it is diminishing in Europe, smoking is still a serious health problem. The craving of Nicotine is one of the hardest behaviours to tackle when a smoking cessation programme is implemented. Following on previous work [1], which aimed at evaluating the possibility of inducing smoking craving in smokers using a VR platform, the present study was devised to assess the role of craving in cognitive processing through event related potentials (ERP). From an initial sample of 89 university students (smokers and non-smokers), which was randomly exposed to VR smoking cues and VR non-smoking cue scenarios, a subsample of 13 smokers and non-smokers was drawn. This subsample (M = 23.08; SD = 4.39), which had previously been immersed in the VR smoking cues environment, was presented to a rapid (1 sec) serial of smoking and neutral images. Data on brain activity was recorded through an EEG during this task to further estimate ERPs. When compared to non-smokers, smokers showed higher frontal activation when watching smoking related images.

Automatic Approach-tendencies Toward Alcohol-related Situations in Heavy Social Drinkers: Using Virtual Environments

Deok-Yong Kim[a] and Jang-Han Lee[a,1]

[a]Department of Psychology, Chung-Ang University

[1]*Corresponding author*:
Jang-Han Lee
clipsy@cau.ac.kr

Abstract

The study aimed to investigate whether the heavy social drinkers group has automatic approach-tendencies toward alcohol-related situations in a virtual environment (VE). Thirty-six male undergraduates (18 heavy social drinkers; HSD, 18 light social drinkers; LSD) performed the virtual approach-avoidance task (V-AAT). In the V-AAT, participants were instructed to respond to signals which make them pull or push a joystick after watching the scenes of the alcohol or non-alcohol-related situations. We found that the HSD group had more approach-tendency toward alcohol-related situations than non-alcohol-related situations. This study found that HSD group has automatic action tendencies not only toward alcohol-related stimulus, but toward alcohol-related situations in the VE. The V-AAT could assess the levels of drinking cravings of social drinkers, because it could provide realistic situations and allow individuals to be more immersed to the VE.

Avatar-Based Recovery: Virtual Reality as an Adjunct to Substance Abuse Treatment

Ivana Steigman[a,1] and Walter Greenleaf[a]

[a]Thrive Research, Inc.

[1]*Corresponding author*:
Ivana Steigman
ivana@thriveresearch.com

Abstract

The traditional behavioral therapy model has significant limitations that reduce its efficacy. Barriers to access and questions of applicability to real-life situations have demonstrated the need for alternative treatment modalities. Online and virtual reality-based treatments show great promise. One such program, Avatar-Based Recovery (ABR) is an online server-based platform that consists of patient and clinical interfaces, ecologically valid assessments, psychoeducational modules, compliance tools, mobile data input and output, and a virtual reality world for behavioral training and practice as well as social support. Key features include behavioral intelligence using an AI agent and natural language processing. Though designed to support the recovery process, the components of the ABR platform can be generalized to many different clinical domains. A pilot study is examining the efficacy of ABR in an opioid addiction treatment clinic. Participants included 40 adults with opioid dependence and were randomly divided into two treatment groups. The control group received treatment as usual (daily methadone administration, once weekly individual counseling, and once weekly support group meetings). The experimental group received daily methadone administration, daily check-ins on cravings and drug use, a weekly psychoeducational module, and an individual VR-assisted therapy session once weekly. Results of the pilot study will address levels of immersion, efficacy, and patient compliance.

Examining Problematic Game Use among Dutch Adolescents with the Theory of Planned Behavior

Maria C. Haagsma[a,1], Daniel L. King[b], Marcel E. Pieterse[a], and Oscar Peters[c]

[a]Department of Psychology, Health & Technology, Faculty of Behavioral Sciences, University of Twente
[b]School of Psychology, The University of Adelaide
[c]Faculty of Behavioral Sciences, University of Twente

[1]*Corresponding author*:
Maria C. Haagsma
m.c.haagsma@utwente.nl

Abstract

The aim of this study was to examine problematic game use (PGU) by applying the Theory of Planned Behavior (TPB). A two-wave study was conducted to examine relations between components of the TPB, descriptive norm, social pressure, playing time and PGU. The initial sample consisted of 810 game-playing adolescents and young adults (72.8% boys) aged 12 to 22 years. Respondents were recruited in pre-vocational and senior vocational schools in the western region of the Netherlands. The results showed that among the 810 gamers, attitudes, subjective norms, perceived behavioral control (PBC) and descriptive norms explained 13% of variance in intention scores. Descriptive norm was found to explain small additional variance. Structural equation modeling revealed that among the 188 gamers who played games in both waves, intention was a significant predictor playing time six months later. Playing time and PBC predicted PGU, together the psychosocial variables, intention, and playing time accounted for 11% of explained variance in PGU. This study provided some support for explaining intention to play excessively and PGU using the TPB. PBC, attitude and descriptive norms emerged as the most important predictors of intention, which in turn significantly predicted playing time. The results of this study can be used in efforts to decrease PGU among adolescents and young adults.

Testing the Usefulness of VR in the Treatment of Pathological Gambling with a Randomized Controlled Trial

Stéphane Bouchard[a,1], Claudie Loranger[a], Manon St-Pierre[a], Lynda Poirier[b], Lucie Laniel[c] and Geneviève Robillard[a]

[a]Université du Québec en Outaouais
[b]Centre CASA c Maison l'Odyssée

[1]*Corresponding author*:
Stéphane Bouchard
stephane.bouchard@uqo.ca

Abstract

A sample of 28 adults suffering from pathological gambling entered a four week residential cognitive-behavioral treatment (CBT) and were randomly assigned to either standard CBT (which include two sessions of imaginal exposure to gambling situations) or CBT + VR (where the imaginal exposure session were replaced by immersions in a virtual reality gambling situation). Because of the limited number of sessions of VR, the goal was not to test increased treatment efficacy, but testing if: (a) VR facilitates the identification of high risk situations and dysfunctional beliefs, early in the treatment; (b) facilitates the relapse prevention exercises, late in the treatment; and (c) raises ethical issues with patients during the treatment. Statistical results and qualitative interviews conducted with the therapists revealed that VR led to the identification of significantly more high risk situations and dysfunctional beliefs. VR induced more urges to gamble during the relapse prevention session and more clinical material to work with during the session. Changes in urges to gamble in the therapy session were significant predictors of treatment outcome. No ethical dilemma or adverse events were reported during the CBT+VR treatment. The findings support conducting efficacy trials using much more intensive use of VR in the CBT of pathological gamblers, not only in relapse prevention strategies, but also for cognitive restructuring while patients are emotionally aroused by urges.

Virtual Reality for Smoking Cessation: a Case Report

Irene Pericot-Valverde[a], Olaya García Rodríguez[b,1], Marta Ferrer-García[a], Roberto Secades-Villa[b] and José Gutiérrez-Maldonado[a]

[a]University of Barcelona, Spain
[b]University of Oviedo, Spain

[1]*Corresponding author*:
Olaya García Rodríguez
garciaolaya@uniovi.es

Abstract

Smoking behavior is strongly associated with specific stimuli and contexts. Exposure to smoking-related cues can elicit tobacco craving and trigger cigarette use. Relapse prevention training (RPT) and cue exposure treatment (CET) may be two effective techniques for smoking cessation treatments. RPT focuses on enhancing patients' skills in order to prevent relapse after quitting smoking. CET exposes the smoker to drug-related cues aimed to reduce cue and context reactivity by extinction processes. As a treatment for addictive behaviours, CET has various modes of exposure, one pf the most innovative being the use of Virtual Reality (VR).

The aim of the present study was to test the Virtual Stop Smoking (VSS) program, a multicomponent behavioural treatment for smoking cessation that integrates a module of VR graded exposure in a 22-year old female smoker.

ICT TOOLS FOR PROMOTING EMOTIONAL REGULATION

Virtual Reality and Mood Induction Procedures for Emotion Regulation and Improving Well-Being

B. Serrano[a,d,1], C. Botella[a,d], M. Alcañiz[b,d] and R.M. Baños[c,d]

[a]Universidad Jaume I
[b]Universidad Politécnica de Valencia
[c]Universidad de Valencia
[d]CIBER de Fisiopatología de la Obesidad y Nutrición

[1]*Corresponding author*:
Berenice Serrano
bserrano@uji.es

Abstract

This paper describes a flexible and highly interactive Virtual Reality (VR) environment which includes Mood-Induction Procedures (MIPs) designed to induce relaxation. Different MIPs such as affective pictures, sounds of nature, and emotional music, video, self-statements and narratives are used. The VR environment is a house called "House of relaxation" whose purpose is to be a useful tool for promoting emotional regulation and well-being. The "House of relaxation" was assessed in a group of twenty-six participants in relation to its effectiveness to regulate emotions, induce relaxation and generate sense of presence. Several measures (Visual Analogue Scale, Self-Assessment Manikin, and Presence Self-Assessment Manikin) were used. The results indicate that it is possible to generate a relaxation mood; moreover, it was found that participants experienced a high sense of presence. It is concluded that it is possible to regulate and induce positive emotions using a VR environment that allows using different kinds of MIPs. The re-

sults show the "House of relaxation" can be a useful tool in facilitating emotion regulation and well-being of people in their everyday lives.

Smiling is Fun: A Coping with Stress and Emotion Regulation Program

Cristina Botella[a,d,1], Adriana Mira[a], Azucena Garcia-Palacios[a,d], Soledad Quero[a,d], Mª Vicenta Navarro[a], Antonio Riera López Del Amo[a], Guadalupe Molinari[a], Diana Castilla[a,d], Inés Moragrega[a,d], Carla Soler[a], Mariano Alcañiz[c,d] and Rosa Maria Baños[b,d]

[a]Universitat Jaume I
[b]Universidad de Valencia
[c]Universidad Politécnica de Valencia
[d]CIBER Fisiopatología Obesidad y Nutrición, Instituto Carlos III, Spain

[1]*Corresponding author*:
Cristina Botella
botella@psb.uji.es

Abstract

Emotional disorders (Anxiety disorders and Mood disorders) are one of the most common health problems worldwide, and their economic costs are very high. People suffering from emotional disorders often use maladaptive emotion regulation strategies and have low coping behaviour that contributes to the presence of clinical symptoms. For this reason, it is important to develop strategies to monitor coping and promote emotion regulation in people exposed to high levels of stress. Information and Communication Technologies (ICT) can help us in this task. Recent systematic reviews of literature on evidence-based CBT treatments delivered via the Internet show that these approaches are effective. We have developed an intervention program ICT based: Coping with Stress and Emotion Regulation Program (Smiling is Fun), a self-applied program via the Internet. Smiling is Fun follows a transdiagnostic perspective, and it is based on CBT techniques. However, it also includes other psychological strategies to improve positive mood. The aim of the present work is to describe Smiling is Fun and the study designed to test its efficacy.

Promotion of Emotional Wellbeing in Oncology Inpatients using VR

Macarena Espinoza[a], Rosa M. Baños[b,d,1], Azucena García Palacios[a,d], José M. Cervera[c], Gaspar Esquerdo[c], Enrique Barrajón[c] and Cristina Botella[a,d]

[a]Universitat Jaume I, Spain
[b]Universitat de Valencia, Spain
[c]Instituto del Tratamiento Integral del Cancer (ITIC), Hospital Clínica Benidorm, Spain
[d]CIBER Fisiopatología Obesidad y Nutrición, Instituto Carlos III, Spain

[1]*Corresponding author*:
Macarena Espinoza
macarenaespinoza_v@yahoo.es

Abstract

In Psycho-oncology, VR has been utilized mainly to manage pain and distress associated to medical procedures and chemotherapy, with very few applications aimed at promotion of wellbeing in hospitalized patients. Considering this, it was implemented a psychological intervention that uses VR to induce positive emotions on adult oncology inpatients with the purpose of evaluating its utility to improve emotional wellbeing in this population.

Method: Sample was composed of 33 patients (69.7% men, aged from 41 to 85 years old; X=62.1; SD=10.77). Intervention lasted 4 sessions of 30 minutes, along one week. In these sessions, two virtual environments designed to induce joy or relaxation were used. Symptoms of depression and anxiety (Hospital Anxiety and Depression Scale, HADS) and level of happiness (Fordyce Scale) were assessed before and after the VR intervention. Also, Visual Analogue Scales (VAS) were used to assess emotional state and physical discomfort before and after each session.

Results: There were significant improvements in distress and level of happiness after the VR intervention. Also, it was detected an increment in positive emotions and a decrease in negative emotions after sessions.

Conclusions: Results emphasize the potential of VR as a positive technology that can be used to promote wellbeing during hospitalization, especially considering the shortness of the intervention and the advanced state of disease of the participants. Despite the encouraging of these results, it is necessary to confirm them in studies with larger samples and control groups.

An Online Emotional Regulation System to Deliver Homework Assignments for Treating Adjustment Disorders

Soledad Quero[a,c,1], Mar Molés[a], M. Angeles Pérez-Ara[a], Cristina Botella[a,c] and Rosa M. Baños[b,c]

[a]Universitat Jaume I
[b]Universidad de Valencia
[c]CIBER de Fisiopatología de la Obesidad y Nutrición (CIBEROBN)

[1]*Corresponding author*:
Soledad Quero
solequerocas@gmail.com

Abstract

Adjustment Disorders (AD) is a very common mental health problem in primary care. Only general treatment guidelines are available for its treatment. Our research team has developed a cognitive-behavioural treatment (CBT) supported by Virtual reality (EMMA system) that has shown its utility in the treatment of AD. EMMA is a VR adaptive display that adapts its presentation to the patient' therapeutic needs. So far, researchers have been centered on how to use the Information and Communication Technologies to deliver treatment within the therapeutic context. TEO is a completely open Online Emotional Therapy web-based system that allows creating personalized therapeutic material. The patient can access this material over the Internet. Preliminary data about the acceptability of TEO system in a case study has already been obtained. The aim of the present work is to describe the session protocol regarding the homework assignments component in the treatment of AD designed in TEO system. Also, data about preferences and efficacy of TEO system versus traditional homework assignments implementation in a single case study with AD are presented. A web-based system of this kind increases the possibilities for therapy.

GameTeen: New Tools for Evaluating and Training Emotional Regulation Strategies

Alejandro Rodríguez[a,1], Beatriz Rey[a,c], Mariano Alcañiz[a,c], Rosa Baños[b,c], Jaime Guixeres[a],Maja Wrzesien[a], Mario Gómez[a], David Pérez[a], Paloma Rasal[b] and Elena Parra[a]

[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universitat Politècnica de València, I3BH/LabHuman, Camino de Vera s/n, 46022 Valencia, España;
[b]Universidad de Valencia, Spain;
[c]Ciber, Fisiopatología de Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Spain

[1]*Corresponding author*:
Alejandro Rodríguez
arodriguez@labhuman.i3bh.es

Abstract

The aim of this paper is to describe GameTeen, a novel instrument for the assessment and training of Emotional Regulation (ER) strategies in adolescent population. These new tools are based on the use of 3D serious games that can be played under different settings. The evolution of ER strategies will be monitored in two ways depending on the setting where the tool is presented. Firstly, in the laboratory, physiological signals and facial expressions of participants will be recorded. Secondly, in real life settings, ecological momentary assessment tools will be used to obtain answers from the subjects using their mobile phone. The goal is to obtain more attractive and reliable tools to evaluate and train ER strategies.

COPING WITH THE NEGATIVE SIDE OF NEW MEDIA

Mobilizing Bystanders of Cyberbullying: An Exploratory Study into Behavioural Determinants of Defending the Victim

Ann Desmet[a,1] , Sara Bastiaensens[b], Katrien Van Cleemput[b], Karolien Poels[b], Heidi Vandebosch[b], and Ilse De Bour-Deaudhuij[a]

[a]Ghent University, Faculty of Medicine and Health Sciences, Department of Movement and Sport Sciences
[b] University of Antwerp, MIOS, Department of Communication Science

[1]*Corresponding author*:
Ann Desmet
Ann.DeSmet@ugent.be

Abstract

This study explores behavioural determinants of defending behaviour in cyberbullying incidents. Three focus groups were conducted with young people aged 12-16y in May 2012. Major themes that were found as important behavioural determinants to defend the victim were a low moral disengagement, that the victim is an in-group member and that the bystander is popular. Bystanders preferred to handle cyberbullying offline and in person, and comforting the victim was considered more feasible than facing the bully. With a high peer acceptance of passive bystanding and lack of parental support for defending behaviour, youngsters do not receive much encouragement from their environment to exhibit defending behaviour towards victims. These preliminary results suggest befriending and peer support interventions hold promise, as well as environmental interventions with parents and teachers. These first results will need to be confirmed in more in-depth analyses and in quantitative research.

Online Social Networking and the Experience of Cyber-Bullying

Bridianne O'Dea[a,1] and Dr Andrew Campbell[a]

[a]The University of Sydney, Australia

[1]*Corresponding author*:
Bridianne O'Dea
bridianne.odea@sydney.edu.au

Abstract

Online social networking sites (SNS) are popular social tools used amongst adolescents and account for much of their daily internet activity. Recently, these sites have presented opportunities for youth to experience cyber-bullying. Often resulting in psychological distress, cyber-bullying is a common experience for many young people. Continual use of SNS signifies the importance of examining its links to cyber-bullying. This study examined the relationship between online social networking and the experience of cyber-bullying.

A total of 400 participants (M_{age} = 14.31 years) completed an online survey which examined the perceived definitions and frequency of cyber-bullying. Users of SNS reported significantly higher frequencies of stranger contact compared to non-users. Spearman's rho correlations determined no significant relationship between daily time on SNS and the frequency of stranger contact. This suggests that ownership of a SNS profile may be a stronger predictor of some cyber-bullying experiences compared to time spent on these sites. Findings encourage continued research on the nature of internet activities used by young adolescents and the possible exposure to online victimization. search.

User Validation of an Empathic Virtual Buddy against Cyberbullying

Janneke M. Van Der Zwaan[a,1], Elke Geraerts[b], Virginia Dignum[a]and Catholijn M. Jonker[a]

[a]Delft University of Technology
[b]Erasmus University Rotterdam

[1]*Corresponding author*:
Janneke M. Van Der Zwaan
j.m.vanderzwaan@tudelft.nl

Abstract

People are able to comfort others by talking about their problems. In our research, we are exploring whether computers can provide social support in a similar manner. Recently, we proposed a design for an empathic virtual buddy that supports victims of cyberbullying. To validate our approach in providing social support and to gather feedback from potential users, we performed an experiment (N = 30) to compare interaction with the buddy to reading a text. Both the buddy and the text received high scores; scores for the buddy were consistently higher. The difference was significant for the extent to which feelings were taken into account. These results indicate that participants liked to interact with the buddy and that they recognized the emotional cues emitted by the buddy, thus validating our approach in comforting users.

Influence of Parental Attitudes Towards the Internet on Internet Safety Precautions at Home

Georgios Floros[a,b,1], Konstantinos Siomos[a], Evaggelia Dafouli[a,c], Virginia Fisoun[a,d] and Dimitrios Geroukalis[d]

[a]Hellenic Association for the Study of Internet Addiction Disorder, Larissa, Greece
[b]2nd Department of Psychiatry, Aristotle University of Thessaloniki, Greece
[c]High School Educator
[d]Psychiatric Department, 'Evaggelismos' General Hospital of Athens, Greece
[e]'Hippocrates' Center for Drug abuse prevention, Kos, Greece

Abstract

In this paper we present the results of a cross-sectional study of the entire adolescent student population aged 12-18 of the island of Kos and their parents, on Internet safety-related practices and attitudes towards the Internet. Total sample was 2017 students and 1214 parent responders. Research material included extended demographics and an Internet security questionnaire, the Internet Attitudes Scale (IAS) for parents and the Adolescent Computer Addiction Test (ACAT) for children and both parents. Both parents thus provided their views on their children's Internet use and an estimate for their degree of computer addiction which was tested against their child's own estimate. Results indicated that fathers and mothers who had negative views of the Internet, tended to encourage less their children to engage in online activities and worried more for the possibility that their child is addicted; their worries weren't correlated with their children's results. Parental views on the Internet had no effect on the level of security precautions they employed at home. Those parents who reported a low level of security knowledge and were unsure as to what their children were doing online tended to consider their children more likely to be addicted; those views were confirmed by their children' results.

The Impact of Prolonged Violent Action Video-gaming on Adolescent Sleep-wake Activity

Daniel L. King[a,b], Michael Gradisar[a], Aaron Drummond[a], Jason Wessel[a], Gorica Micica[a], Nicole Lovato[a], Paul Douglas[a] and Paul Delfabbro[b]

[a]School of Psychology, Flinders University
[b]School of Psychology, The University of Adelaide

[1]*Corresponding author*:
Daniel L. King
daniel.king@adelaide.edu.au

Abstract

Video-gaming is an increasingly prevalent activity among children and adolescents that is known to impact on several areas of emotional, cognitive and behavioral functioning. Currently there is insufficient laboratory research evidence about how extended video-game play may affect sleep in adolescence. The aim of this study was to investigate the immediate impact of prolonged exposure to video-gaming on adolescent sleep patterns and quality of sleep.

Seventeen male adolescents aged 15 to 17 years and with no concurrent sleep difficulties were recruited. Participants were exposed to voluntary video-gaming containing fast-paced, violent action for 50 min or 150 min before their usual bedtime, on two different testing nights. Physiologic measures of sleep-onset latency (SOL), sleep architecture, and heart rate (HR) were obtained during video-gaming and sleep phases using polysomnography and a heart rate sensor. Subjective sleep-wake activity and sleep quality were assessed by a battery of questionnaires.

Prolonged exposure to violent video-gaming resulted in less total sleep time and decreased sleep efficiency as compared to regular video-gaming exposure. Prolonged video-gaming had no observable effect on sleep architecture, including slow-wave sleep and REM sleep stages. Physiological arousal did not differ significantly between video-gaming conditions in either the video-gaming or sleep-onset phase. Excited mood and desire to continue video-gaming was significantly positively related to SOL in the regular video-gaming condition.

The results suggest that prolonged video-gaming exposure negatively affects total sleep time and sleep efficiency among adolescents, but has a minimal effect on SOL and sleep quality. These findings were consistent with emerging polysomnographic research that reports electronic media exposure before sleep may be more impactful on children than older adolescents and adults.

TECHNOLOGY SOLUTIONS FOR INVISIBLE WOUNDS OF WAR

Use of a Virtual Integrated Environment in Prosthetic Limb Development and Phantom Limb Pain

Aimee L. Alphonso[a], Brett T. Monson[a], Michael J. Zeher[b], Robert S. Armiger[b], Sharon R. Weeks[a], J.M. Burck[b], C. Moran[b], R. Davoodie[b], G. Loeb[b], Paul F. Pasquina[b] and Jack W. Tsao[c]

[a]Walter Reed National Military Medical Center, Bethesda, MD, USA
[b]John Hopkins University, Baltimore, MD, USA
[c]US Navy Bureau of Medicine and Surgery, Washington, DC, USA

[1]*Corresponding author*:
Jack W. Tsao
jack.tsao@med.navy.mil

Abstract

Patients face two major difficulties following limb loss: phantom limb pain (PLP) in the residual limb and limited functionality in the prosthetic limb. Many studies have focused on decreasing PLP with mirror therapy, yet few have examined the same visual ameliorating effect with a virtual or prosthetic limb. Our study addresses the following key questions: (1) does PLP decrease through observation of a 3D limb in a virtual integration environment (VIE) and (2) can consistent surface electromyography (sEMG) signals from the VIE drive an advanced modular prosthetic limb (MPL)? Recorded signals from the residual limb were correlated to the desired motion of the phantom limb, and changes in PLP were scored during each VIE session. Preliminary results show an overall reduction in PLP and a trend toward improvement in signal-to-motion accuracy over time. These signals allowed MPL users to perform a wide range of hand motions.

Outcomes from a Pilot Study using Computer-Based Rehabilitative Tools in a Military Population

Katherine W. Sullivan[a,c], Julia E. Quinn[a,b], Michael Pramuka[a,c], Laura A. Sharkey[a,b] and Louis M. French[a,b,c,1]

[a]Walter Reed National Military Medical Center
[b]Center for Neuroscience and Regenerative Medicine
[c]Defense and Veterans Brain Injury Center

[1]*Corresponding author*:
Louis M. French
louis.French@med.navy.mil

Abstract

Novel therapeutic approaches and outcome data are needed for cognitive rehabilitation for patients with a traumatic brain injury; computer-based programs may play a critical role in filling existing knowledge gaps. Brain-fitness computer programs can complement existing therapies, maximize neuroplasticity, provide treatment beyond the clinic, and deliver objective efficacy data. However, these approaches have not been extensively studied in the military and traumatic brain injury population. Walter Reed National Military Medical Center established its Brain Fitness Center (BFC) in 2008 as an adjunct to traditional cognitive therapies for wounded warriors. The BFC offers commercially available "brain-training" products for military Service Members to use in a supportive, structured environment. Over 250 Service Members have utilized this therapeutic intervention. Each patient receives subjective assessments pre and post BFC participation including the Mayo-Portland Adaptability Inventory-4 (MPAI-4), the Neurobehavioral Symptom Inventory (NBSI), and the Satisfaction with Life Scale (SWLS). A review of the first 29 BFC participants, who finished initial and repeat measures, was completed to determine the effectiveness of the BFC program. Two of the three questionnaires of self-reported symptom change completed before and after participation in the BFC revealed a statistically significant reduction in symptom severity based on MPAI and NBSI total scores ($p < .05$). There were no significant differences in the SWLS score. Despite the typical limitations of a retrospective chart review, such as variation in treatment procedures, preliminary results reveal a trend towards improved self-reported cognitive and functional symptoms.

Psychophysiologic Identification of Subthreshold PTSD in Combat Veterans

Michael J. Roy[a,1], Michelle Costanzo[a] and Suzanne Leaman[a]

[a]Uniformed Services University, Bethesda, MD, USA

[1]*Corresponding author*:
Michael J. Roy
mroy@usuhs.mil

Abstract

Posttraumatic stress disorder (PTSD) is linked with adverse health outcomes, and many military service members (SMs) are afflicted with it after they return from combat. Since many SMs have an initial honeymoon period characterized by limited symptoms before the onset of full-blown PTSD, the identification of independent predictors of PTSD upon return from deployment could facilitate early intervention. We measured psychophysiologic responses to stimuli including explosions in a Virtual Iraq/Afghanistan environment, as well as a fear potentiated startle paradigm, in a prospective cohort of SMs who did not meet criteria for PTSD and were within 2 months after return from deployment. We report marked psychophysiologic differences between those with (n=29) and without (n=30) subthreshold PTSD symptoms (PTSD Checklist score >28 vs. <28). We believe this is evidence that psychophysiologic measures can help to identify individuals at high risk for PTSD.

Effectiveness Evaluation for Short-Term Group Pre-Deployment VR Computer-Assisted Stress Inoculation Training Provided to Polish ISAF Soldiers

Stanislaw Ilnicki[a,1], Brenda K. Wiederhold[b], Justyna Maciolek[a], Ludmila Kosinka[a], Sylwia Szymanska[a], Maciej Zbyszewski[a], Ewelina Opalko-Piotrkiewicz[a], Anna Siatkowska[a], Piotr Ilnicki[a], Anna Glibowska[c], Dorota Borzetka[c], Katarzyna Pleskacz[d] and Piotr Murawski[d]

[a]Department of Psychiatry and Combat Stress, Military Medical Institute, Warsaw, Poland
[b]Virtual Reality Medical Center, San Diego, CA, United States
[c]Polish 10th Armoured Cavalry Brigade, Swietoszow, Poland
[d]ICT Department, Military Medical Institute, Warsaw, Poland

[1]*Corresponding author*:
Stanislaw Ilnicki
silnicki@wim.mil.pl

Abstract

The goal of this study was to assess effectiveness of a short collective stress inoculation training (SIT) conducted according to the methodology of the Virtual Reality Medical Center of San Diego (Training of Physiological Control Exposure to Virtual Stressor while Maintaining Physiological Control). The results obtained indicate a short-term effectiveness of the training as a method of tension reduction. However, in the long-term perspective these results are ambiguous and they suggest a need of further research. In order to extend the analysis effects of temperamental factors on training effectiveness was presented.

Virtual Reality from a Distance: Lessons Learned from Telehealth

Raymond A. Folen[a,1]

[a] Tripler Army Medical Center, Honolulu, Hawaii

[1]*Corresponding author*:
Raymond A. Folen
raymond.folen@amedd.army.mil

Abstract

Therapeutic virtual reality environments are now both increas-

ingly transportable and more widely available to consumers. Improvements in technology infrastructure at both provider and patient locations have created the opportunity for an individual to receive VR treatment services from distant providers who may be physically located thousands of miles away from the patient. Studies from behavioral telehealth suggest that treatments provided via distance modalities are equivalent to services provided face-to-face with regard to patient-provider rapport, the ability to accurately assess and diagnose, treatment outcome, and the frequency of adverse events. There is also evidence that behavioral telehealth increases access to care, reduces stigma, allows for closer patient follow-up, reduces cost, and results in increased patient and provider satisfaction. Providing telehealth services via videoconferencing, text messaging or virtual reality requires a special skill set, however, as it presents many unique challenges not present in face-to-face care. Therapists who use virtual reality were surveyed with regard to their use of VR via telehealth. Those who responded affirmatively were further questioned about their awareness of, and procedures used to address, issues of particular importance to this medium of treatment. These issues include provider competence, patient selection, informed consent, safety, ethics and licensure. The extent to which VR via telehealth is incorporated into the VR therapists' practice and the degree to which therapists have considered and addressed these unique telehealth issues will be presented.

The Effectiveness of VR Exposure Therapy for PTSD in Returning Warfighters

Sarah D. Miyahira[a,1], Raymond A. Folen[b], Hunter G. Hoffman[c], Azucena Garcia-Palacios[d], James L. Spira[e] and Michelle Kawasaki[e]

[a]U.S. Army Pacific Regional Medical Command, Honolulu, Hawaii, USA
[b]Tripler Army Medical Center, Honolulu, Hawaii, USA
[c]University of Washington, Seattle, Washington, USA
[d]Universitat Jaume 1, Castellon, Spain
[e]VA National Center for PTSD, VAPIHCS, Honolulu, Hawaii, USA

[1]*Corresponding author*:
Sarah D. Miyahira
sarah.d.miyahira@us.army.mil

Abstract

In the decade following the attack on the World Trade Center, over 2.3 million American military personnel were deployed to Iraq and Afghanistan. Lengthy tours of duty and multiple redeployments were characteristic of these operations. Research findings demonstrate that prolonged exposure to combat increases the risk of developing posttraumatic stress disorder (PTSD). The current study was a randomized controlled clinical trial designed to assess the effectiveness of a novel intervention to treat combat-related PTSD in returning Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) warfighters. A cognitive behavior treatment approach augmented with virtual reality exposure therapy (VRE) was developed, and administered for 10 treatment sessions over 5 weeks. Comparisons with a control group receiving minimal attention (MA) for 5 weeks revealed that the VRE group had significant reductions in the avoidance/numbing symptoms on the Clinician Administered PTSD Scale (CAPS). The VRE group also had significant reductions in guilt at post-treatment compared to the control group.

PHIT for Duty, a Mobile Approach for Psychological Health Intervention

Paul N. Kizakevich[a,1], Robert Hubal[a], Janice Brown[a], Jennifer Lyden[a], James Spira[b], Randall Eckhoff[a], Yuying Zhang[a], Stephanie Bryant[a] and Gilberto Munoz[a]

[a]RTI International, Research Triangle Park, NC, USA
[b]National Center for PTSD, Veterans Health Affairs, Honolulu, HI, USA

[1]*Corresponding author*:
Paul N. Kizakevich
kiz@ rti.org

Abstract

The goal of this effort is to support prevention of psychological health problems through innovation in mobile personal health assessment and self-help intervention (SHI). For the U.S. military, we are developing and evaluating a field-deployable personalized application, PHIT for Duty™, to help build resilience in healthy troops and support prevention in high-risk personnel. PHIT for Duty is delivered using any smartphone or tablet with optional nonintrusive physiological and behavioral sensors for health status monitoring. The application integrates a suite of health assessments with an intelligent advisor that recommends, tailors, and presents self-help advisories. PHIT for Duty is intended for secondary prevention of psychological health problems in persons who have been exposed to psy-chological trauma and may be showing some symptoms of distress, but have not been diagnosed with any psychological disease or disorder.

Developing Technological Support for PTSD Prevention: a Review

Vanessa Vakili[a], Willem-Paul Brinkman[a,1] and Mark A. Neerincx[a,b]

[a]Delft University of Technology,
Netherlands
[b]TNO Human Factors,
Netherlands

[1]*Corresponding author*:
Willem-Paul Brinkman
w.p.brinkman@tudelft.nl

Abstract

This is a review of five state-of-the-art PTSD prevention technologies which: characterizes them across training approaches; seeks insights via interviews with the system developers; and extracts key lessons for future developers. This research is novel in reviewing technologies in the military domain for PTSD prevention as opposed to treatment, and in speaking from the perspective of system development and design issues.

ADVANCED MONITORING

Reliability and Validity of TIPS Wireless ECG Prototypes

Alejandro Rodríguez[a,1], Jaime Guixeres[a], Beatriz Rey[a,b] and Mariano Alcañiz[a,b]

[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universidad Politécnica de València, I3BH/LabHuman, Camino de Vera s/n, 46022 Valencia, España
[b]Ciber, Fisiopatología de Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Spain

[1]*Corresponding author*:
Alejandro Rodríguez
arodriguez@labhuman.i3bh.es

Abstract

The aims of the present study are to examine the reliability and validity of the Heart Rate signal registered using two self-made wireless ECG systems, R-Tips and TipsShirt, and to compare them with another commercial ECG device typically used in psychophysiology studies. An ECG simulator was used to artificially generate signals corresponding to different cardiac frequencies. Results of the reliability study showed that the signal acquisition, signal processing and signal transmission were reliable and valid for R-Tips and TipsShirt. Consequently, these wireless ECG prototypes could be used for studies where the freedom of movements of the participants is fundamental without any loss of quality in the registered signals.

Pulse Oximeter Based Mobile Biotelemetry Application

Ali Hakan Işık[a,1] and İnan Güler[b]

[a]Gazi University, Faculty of Technology,
[b]Department of Electronics and Computer Technology, Ankara

[1]*Corresponding author*:
Ali Hakan Işık
ahakan@gazi.edu.tr

Abstract

Quality and features of tele-homecare are improved by information and communication technologies. In this context, a pulse oximeter-based mobile biotelemetry application is developed. With this application, patients can measure own oxygen saturation and heart rate through Bluetooth pulse oximeter at home. Bluetooth virtual serial port protocol is used to send the test results from pulse oximeter to the smart phone. These data are converted into XML type and transmitted to remote web server database via smart phone. In transmission of data, GPRS, WLAN or 3G can be used. The rule based algorithm is used in the decision making process. By default, the threshold value of oxygen saturation is 80; the heart rate threshold values are 40 and 150 respectively. If the patient's heart rate is out of the threshold values or the oxygen saturation is below the threshold value, an emergency SMS is sent to the doctor. By this way, the directing of an ambulance to the patient can be performed by doctor. The doctor for different patients can change these threshold values. The conversion of the result of the evaluated data to SMS XML template is done on the web server. Another important component of the application is web-based monitoring of pulse oximeter data. The web page provides access to of all patient data, so the doctors can follow their patients and send e-mail related to the evaluation of the disease. In addition, patients can follow own data on this page. Eight patients have become part of the procedure. It is believed that developed application will facilitate pulse oximeter-based measurement from anywhere and at anytime.
Keywords. COPD, Wireless, Smart Phone, XML

Using Portable EEG Devices to Evaluate Emotional Regulation Strategies During Virtual Reality Exposure

Beatriz Rey[a,b,1], Alejandro Rodríguez[a] and Mariano Alcañiz[a,b]

[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universidad Politécnica de València, I3BH/LabHuman, Camino de Vera s/n, 46022 Valencia, España
[b]Ciber, Fisiopatología de Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Spain

[1]*Corresponding author*:
Beatriz Rey
brey@labhuman.i3bh.es

Abstract

As Virtual Reality (VR) is starting to be used to train emotional regulation strategies, it would be interesting to propose objective techniques to monitor the emotional reactions of participants during the virtual experience. In this work, the main goal is to analyze if portable EEG systems are adequate to monitor brain activity changes caused by the emotional regulation strategies applied by the participants. The EEG signals captured from subjects that navigate through a virtual environment designed to induce a negative mood will be compared between three experimental groups that will receive different instructions about the emotional regulation strategies to apply. The study will allow us to validate the possibilities of portable EEG devices to monitor emotional regulation strategies during VR exposure.

A System for Automatic Detection of Momentary Stress in Naturalistic Settings

Andrea Gaggioli[a,1], Giovanni Pioggia[b], Gennaro Tartarisco[b], Giovanni Baldus[b], Marcello Ferro[c], Pietro Cipresso[a], Silvia Serino[a], Andrei Popleteev[d], Silvia Gabrilli[d], Rosa Maimone[d] and Giuseppe Riva[a]

[a]Applied Technology for Neuro-Psychology Lab, IstitutoAuxologicoItaliano, Milan, Italy
[b]National Research Council of Italy (CNR), Institute of Clinical Physiology (IFC), Italy
[c]Antonio Zampolli" Institute for Computational Linguistics (ILC)
[d]CREATE-NET, Trento, Italy

[1]*Corresponding author*:
Andrea Gaggioli
andrea.gaggioli@auxologico.it

Abstract

Prolonged exposure to stressful environments can lead to serious health problems. Therefore, measuring stress in daily life situations through non-invasive procedures has become a significant research challenge. In this paper, we describe a system for the automatic detection of momentary stress from behavioral and physiological measures collected through wearable sensors. The system's architecture consists of two key components: a) a mobile acquisition module; b) an analysis and decision module. The mobile acquisition module is a smartphone application coupled with a newly developed sensor platform (Personal Biomonitoring System, PBS). The PBS acquires behavioral (motion activity, posture) and physiological (hearth rate) variables, performs low-level, real-time signal preprocessing, and wirelessly communicates with the smartphone application, which in turn connects to a remote server for further signal processing and storage. The decision module is realized on a knowledge basis, using neural network and fuzzy logic algorithms able to combine as input the physiological and behavioral features extracted by the PBS and to classify the level of stress, after previous knowledge acquired during a training phase. The training is based on labeling of physiological and behavioral data through self-reports of stress collected via the smartphone application. After training, the smartphone application can be configured to poll the stress analysis report at fixed time steps or at the request of the user. Preliminary testing of the system is ongoing.

Automatic Mechanisms for Measuring Subjective Unit of Discomfort

Dwi Hartanto[a,1], Ni Kang[a], Willem-Paul Brinkman[a], Isabel L. Kampmann[b], Nexhmedin Morina[b], Paul G.M. Emmelkamp[b] and Mark A. Neerincx[a,c]

[a]Delft University of Technology, Netherlands
[b]University of Amsterdam, Netherlands
[c]TNO Human Factors, Netherlands

[1]*Corresponding author*:
Dwi Hartanto
d.hartanto@tudelft.nl

Abstract

Current practice in Virtual Reality Exposure Therapy (VRET) is that therapists ask patients about their anxiety level by means of the Subjective Unit of Discomfort (SUD) scale. With an aim of developing a home-based VRET system, this measurement ideally should be done using speech technology. In a VRET system for social phobia with scripted avatar-patient dialogues, the timing of asking patients to give their SUD score becomes relevant. This study examined three timing mechanisms: (1) dialogue dependent (i.e. naturally in the flow of the dialogue); (2) speech dependent (i.e. when both patient and avatar are silent); and (3) context independent (i.e. randomly). Results of an experiment with non-patients (n=24) showed a significant effect for the timing mechanisms on the perceived dialogue flow, user preference, reported presence and user dialog replies. Overall, dialogue dependent timing mechanism seems superior followed by the speech dependent and context independent timing mechanism.

Psychophysiological Pathways to Reality: Responses during Real Life and Virtual Presence

Birgit U. Stetina[a,1], Lisa Maria Glenk[b], Oswald D. Kothgassner[c], Elisabeth Kastenhofer[d], Nathalie Hauk[d] and Ilse Kryspin-Exner[c]

[a]Department of Psychology, Webster University – Campus Vienna
[b]Neurophysiology, Institute of Physiology, Department for Biomedical Sciences, Veterinary Medical University Vienna, Austria
[c]Department of Applied Psychology, Faculty of Psychology, University of Vienna
[ad]VR Lab, Research- and Training Practice, Faculty of Psychology, University of Vienna, Austria

[1]*Corresponding author*:
Birgit U. Stetina
birgit.stetina@univie.ac.at

Abstract

In virtual reality the human operator is part of the virtual world in which several simulations can be synthesized (e.g. Riva, 2005). The presented research addresses differences between living and virtual presence using the basic relationship between humans and dogs and their impact on human psychophysiology.

One-hundred-ten participants (mean age 27.5 years) were exposed to virtual simulations of real-life dogs (using Head-Mounted-Displays) or virtual dog-avatars; or were randomly assigned to a control trial. Psychophysiological parameters included skin conductance level (SCL) and heart rate variability (HRV) as indicators for emotional well-being.

Statistical analyses using GLM procedures (factorial ANOVA for repeated measures) showed no significant differences between the real-life dogs and the virtual avatar. But results indicate better, in relation to health improvement, HRV RMSSD ($F(2,108)=3.661$; $p=.024$) and SCL ($F(2,108)=2.420$; $p=.032$) responses for both experimental groups during the presence of the dog (real/virtual) in relation to the control group.

Thinking of a bedridden person, that might be unable to move, results in basic research, like this one in our study, show a brighter future with multiple uses of VR and other technologies in health care. Our bedridden person could go for a walk with a dog, throw a ball, and play; all in VR including similar psychophysiological reactions. The impact of interaction using VR-technology on on human well-being can already be measured from a psychophysiological point of view. In enhancing interdisciplinary work forthcoming studies hopefully give deeper insights from different disciplines.

Real-time Monitoring of Behavioural Parameters Related to Psychological Stress

Dimitris Giakoumis[a,b,1], Anastasios Drosou[c], Pietro Cipresso[d], Dimitrios Tzovaras[a]I, George Hassapis[a]b, Andrea Gaggioli[d] and Giuseppe Riva[d]

[a]Informatics and Telematics Institute, Centre for Research and Technology Hellas, 6th Km Charilaou-Thermi Road Rd., 57001, Thermi, Thessaloniki, Greece
[b]Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece
[c]Department of Electrical and Electronic Engineering, Imperial College London
[d]Applied Technology for Neuro-Psychology Lab, IRCCS Istituto Auxologico Italiano, Via Pellizza da Volpedo, 41 - 20149 Milano, Italy

[1]*Corresponding author*:
Dimitris Giakoumis
dgiakoum@iti.gr

Abstract

We have developed a system, allowing real-time monitoring of human gestures, which can be used for the automatic recognition of behavioural correlates of psychological stress. The system is based on a low-cost camera (Microsoft Kinect), which provides video recordings capturing the subject's upper body activity. Motion History Images (MHIs) are calculated in real-time from these recordings. Appropriate algorithms are thereafter applied over the MHIs, enabling the real-time calculation of activity-related behavioural parameters. The system's efficiency in real-time calculation of behavioural parameters has been tested in a pilot trial, involving monitoring of behavioural parameters during the induction of mental stress. Results showed that our prototype is capable to effectively calculate simultaneously eight different behavioural parameters in real-time. Statistical analysis indicated significant correlations between five of these parameters and self-reported stress. The preliminary findings suggest that our approach could potentially prove useful within systems targeting automatic stress detection, through unobtrusive monitoring of subjects.

Modeling the Social Networking Experience Objectifying the Subjective

Pietro Cipresso[a,1], Silvia Serino[a], Andrea Gaggioli[a] and Giuseppe Riva[a]

[a]Applied Technology for Neuro-Psychology Lab, IRCCS Istituto Auxologico Italiano, Via Pellizza da Volpedo 41, 20149

Milano, Italy

[1]*Corresponding author*:
Pietro Cipresso
p.cipresso@auxologico.it

Abstract

This study aimed at measuring objectively the experience of using social network sites (SNSs). At this aim, a model of experience has been defined, focusing on three main aspects of time-space continuum of individuals' states: physiological arousal, emotional valence, and attentional resources. At this purpose we developed a new approach to assess such an experience. The main idea is to consider arousal, valence and attention to track the users' experience collecting psychophysiological indexes at predefined period (for example each 10 seconds) to build an empirical model based on these data. Once we got the empirical curve we can fit these data using mathematical models.

The Effect of Olfactory Cues on Presence: It's More Complex Than you Think

Oliver Baus[a,1] and Stéphane Bouchard[b]

[a]University of Ottawa, Ottawa, Ontario, Canada
[b]Université du Québec en Outaouais, Gatineau, Quebec, Canada

[1]*Corresponding author*:
Oliver Baus
obaus033@uottawa.ca

Abstract

The goal of this study was to examine the influence of congruent and incongruent olfactory cues on presence. The 29 participants, unaware that olfactory stimuli would be involved, were briefed that the project meant to identify visual factors influencing presence. While visiting a virtual apartment, participants first entered a bathroom (with odorant), a living room and a bedroom (each with no odorant). In the kitchen, the ambient odor group (AMB; n = 10) was exposed to the ambient olfactory environment, while the congruent odor group (CONG; n = 10) and the incongruent odor group (INCONG; n = 9) were exposed, respectively, to odorants of cinnamon apple pie or urine. They explored each room for one minute, after which a one-item verbal rating of presence was taken. Post-immersion, the participants completed a French-Canadian validated version of the Presence Questionnaire (Witmer & Singer, 1994) while referring specifically to their experience in the kitchen. The hypothesis - that the CONG condition would generate the highest level of presence, followed by the AMB condition, and the INCONG condition - was partially confirmed. An ANOVA of the post-immersion questionnaire results shows a difference between the groups ($F(2,26) = 3.74$, $p < .05$, partial $\eta 2 = .22$), and a Tukey test indicates that this effect came from the difference between the CONG ($M = 63.95$) and AMB groups ($M = 48.58$). However, a one-way repeated measures ANOVA of the one-item ratings failed to detect a significant Condition X Time effect in the kitchen ($F(6,78) = 1.16$, ns).

A Virtual Environment for the Study of Social Gaze in Autism Spectrum Disorders

Ouriel Grynszpan[a,1] and Jacqueline Nadel[a]

[a]CNRS USR 3246, Université Pierre et Marie Curie, Hôpital de La Salpêtrière, Paris

[1]*Corresponding author*:
Ouriel Grynszpan
ouriel.grynszpan@upmc.fr

Abstract

Individuals with High Functioning Autism Spectrum Disorders (HFASD) experience profound difficulties in apprehending face-to-face social interactions. Such impairments have been linked to atypical visual patterns in the exploration of facial expressions. We designed a virtual environment where a realistic human character addresses participants while displaying facial expressions that guide the interpretation of the character's speech. The ability to interpret the character's message was tested on thirteen adolescents/adults with HFASD and fourteen typical individuals under two conditions: free visual exploration versus a gaze-contingent viewing window restraining the area of clear vision to a rectangle centred on the focal point. Fixation data revealed that the HFASD group did not regulate their eye movements according to the condition as efficiently as the typical group, thus suggesting impairments in self-monitoring of gaze. The gaze-contingent viewing window induced a visual behaviour whereby social interpretation scores correlated with the time spent gazing at faces. By constraining lateral vision, this virtual environment appears as an interesting medium for training social gaze in HFASD.

NEW APPROACHES AND TRENDS IN REHABILITATION

Postural Control of Elderly: Moving to Predictable and Unpredictable Targets

Vera Jongman[a], Claudine J. C. Lamoth[a,1], Helco van Keeken[a]and Simone R. Caljouw[a]

[a]Center for Human Movement Sciences, University Medical Centre Groningen, University of Groningen, the Netherlands

[1]*Corresponding author*:
Claudine J. C. Lamoth
c.j.c.lamoth@med.umcg.nl

Abstract

Impaired postural control with muscle weakness is an important predictor of falls within the elderly population. Particular daily activities that require weight shifting in order to be able to reach a specific target (a cup on a table) require continuous adjustments to keep the body's center of mass balanced. In the present study postural control was examined in healthy elderly and young subjects during a task in which subjects had to move the body's center of mass towards a virtual target on a screen that appeared at predictable and unpredictable locations. Postural control decreased with unpredictable targets, e.g., movement time was larger, trajectories more irregular. The results indicate that even though older individuals clearly benefitted from the early release of target location information, young individuals improved even more when target information became available. This indicates that the young were better able to use this information prospectively for executing the target directed movement quickly and accurately.

Therapeutic Effectiveness of a Virtual Reality Game in Self-Awareness after Acquired Brain Injury

Roberto Lloréns[a], María Dolores Navarro[b], Mariano Alcañiz[a,c,1] and Enrique Noé[b]

[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universitat Politècnica de València, Camino de Vera s/n, 46022 Valencia, Spain.
[b]Servicio de Neurorrehabilitación de los Hospitales NISA Valencia al Mar y Sevilla Aljarafe, Fundación NISA, Río Tajo 1, 46011 Valencia, Spain
[c]Ciber, Fisiopatología Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Av. Sos Baynat s/n, Universitat de Jaume I, 12071 Castellón, Spain

[1]*Corresponding author*:
Mariano Alcañiz
malcaniz@labhuman.i3bh.es

Abstract

Self-awareness deficits can manifest as a consequence of acquired brain injury decreasing the motivation and the adherence to the treatment. We present a multitouch system that promotes the role-playing and the self-assessment strategies and challenges the participants in a competitive context. This paper presents an initial clinical trial to study the effectiveness of the virtual system in the rehabilitation of the self-awareness skills. According the evolution of the participants in the Self-Awareness Deficits Interview and in the Spanish Social Skills Scale, the participants improve the perception of their deficits and disabilities.

Using Virtual Week To Assess Prospective Memory In Younger And Oder Adults

Giovanna Mioni[a], Franca Stablum[a] and Peter G. Rendell[b]

[a]Dipartimento di Psicologia Generale, Università degli Studi di Padova, Italy
[b]School of Psychology, Australian Catholic University, Melbourne, Victoria, Australia

[1]*Corresponding author*:
Giovanna Mioni
giovanna.mioni@unipd.it

Abstract

Prospective memory (PM) is the ability to perform future intention. Older adults often present dysfunctions in PM tasks and investigating the nature of their difficulties have critical implication for their indipendent living. Virtual Week is a computer based program that simulate real week activities. Participants also performed executive functions tasks to investigate which abilities are involved in PM. Virtual Week has shown to be suitable instrument to evaluate PM performance with important implications on assessment and rehabilitation of PM dysfunctions.

Balance Recovery Through Virtual Stepping Exercises using Kinect Skeleton Tracking: a Follow-up Study with Chronic Stroke Patients

Roberto Lloréns[a,1], Mariano Alcañiz[a,b], Carolina Colomer[c], María Dolores Navarro[c]
[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universitat Politècnica de València, Camino de Vera s/n, 46022 Valencia,

Spain[b]Ciber, Fisiopatología Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Av. Sos Baynat s/n, Universitat de Jaume I, 12071 Castellón, Spain.
[c]Servicio de Neurorrehabilitación de los Hospitales NISA Valencia al Mar y Sevilla Aljarafe, Fundación NISA, Río Tajo 1, 46011 Valencia, Spain.

[1]*Corresponding author*:
Roberto Llorénsa
rllorens@labhuman.i3bh.es

Abstract

Stroke patients often suffer from hemiparesis, which affects their balance condition and consequently their self-dependency and quality of life. Balance rehabilitation can be a long and tedious process. Virtual rehabilitation systems have been reported to provide therapeutic benefits to the balance recovery of stroke patients while increasing their motivation. This paper presents a follow-up study involving chronic stroke patients to evaluate the clinical effectiveness of a virtual stepping exercise using skeleton tracking through a low-cost Kinect depth sensor.

Sensor-based Making of Music to Increase Stroke Patients' Range of Movement and Cognitive Abilities

Jasmine Alfalahi[a] and Olivier Courteille[ab,1]

[a]Health Informatics, Karolinska Institute, Sweden
[b]Dept of LIME, Karolinska Institute, Sweden

[1]*Corresponding author*:
Olivier Courteille
Olivier.courteille@ki.se

Abstract

One promising application of music-making programs is in the treatment of neurological and developmental disorders. We anticipate that the integration of a remote free gesture recognition interface with an interactive music-making program would increase stroke patients' range of movement and cognitive abilities. A kinect-based stroke rehabilitation was therefore suggested to provide a cost effective way of therapy without the hassle of the patients leaving their house or the cost involved. Occupational therapists could thus follow up with the patients' progress by remotely checking their scoring in the system. This innovative rehabilitation method may prove beneficial in decreasing the dependency of stroke patients on society and families, as well as in increasing their self confidence and quality of life.

FRIEND: A Brain-Monitoring Agent for Adaptive and Assistive Systems

Alexis Morris[a,1] and Mihaela Ulieru[a]

[a]Adaptive Risk Management Lab, University of New Brunswick, Fredericton, NB, Canada

[1]*Corresponding author*:
Alexis Morris
alexis.morris@unb.ca

Abstract

This paper presents an architectural design for adaptive-systems agents (FRIEND) that use brain state information to make more effective decisions on behalf of a user; measuring brain context versus situational demands. These systems could be useful for alerting users to cognitive workload levels or fatigue, and could attempt to compensate for higher cognitive activity by filtering noise information. In some cases such systems could also share control of devices, such as pulling over in an automated vehicle. These aim to assist people in everyday systems to perform tasks better and be more aware of internal states. Achieving a functioning system of this sort is a challenge, involving a unification of brain-computer-interfaces, human-computer-interaction, soft-computing, and deliberative multi-agent systems disciplines. Until recently, these were not able to be combined into a usable platform due largely to technological limitations (e.g., size, cost, and processing speed), insufficient research on extracting behavioral states from EEG signals, and lack of low-cost wireless sensing headsets. We aim to surpass these limitations and develop control architectures for making sense of brain state in applications by realizing an agent architecture for adaptive (human-aware) technology. In this paper we present an early, high-level design towards implementing a multi-purpose brain-monitoring agent system to improve user quality of life through the assistive applications of psycho-physiological monitoring, noise-filtering, and shared system control.

Implicit Theory Manipulations Affecting Efficacy of a Smartphone Application Aiding Speech Therapy for Parkinson's Patients

Peter Nolan[a,1], Sherria Hoskins[a], Julia Johnson[b], Vaughan Powell[a], K.Ray Chaudhuri[b] and Roger Eglin[a]

[a]University of Portsmouth
[b]King's College Hospital, London

[1]*Corresponding author*:
Peter Nolan
peter.nolan@port.ac.uk

Abstract

A Smartphone speech-therapy application (STA) is being de-

veloped, intended for people with Parkinson's disease (PD) with reduced implicit volume cues. The STA offers visual volume feedback, addressing diminished auditory cues. Users are typically older adults, less familiar with new technology. Domain-specific implicit theories (ITs) have been shown to result in mastery or helpless behaviors. Studies manipulating participants' implicit theories of 'technology' (Study One), and 'ability to affect one's voice' (Study Two), were coordinated with iterative STA test-stages, using patients with PD with prior speech-therapist referrals. Across studies, findings suggest it is possible to manipulate patients' ITs related to engaging with a Smartphone STA. This potentially impacts initial application approach and overall effort using a technology-based therapy.

A Motor Imagery Based Brain-Computer Interface for Stroke Rehabilitation

R. Ortner[a], D.-C. Irimia[b], J. Scharinger[c] and C. Guger[a]

[a]g.tec Guger Technologies OG, Austria
[b]Faculty of Electrical Engineering, Technical University of Iasi, Romania
[c]Department of Computational Perception, Johannes Kepler University Linz, Austria

[1]*Corresponding author*:
Rupert Ortner
ortner@gtec.at

Abstract

Brain-Computer Interfaces (BCIs) have been used to assist people with impairments since many years. In most of these applications the BCI is intended to substitute functions the user is no longer able to perform without help. For example BCIs could be used for communication and for control of devices like robotic arms, wheelchairs or also orthoses and prostheses. Another approach is not to replace the motor function itself by controlling a BCI, but to utilize a BCI for rehabilitation that enables the user to restore normal or "more normal" motor function. Motor imagery (MI) itself is a common strategy for motor rehabilitation in stroke patients. The idea of this paper is it to assist the MI by presenting online feedback about the imagination to the user. A BCI is presented that classifies MI of the left hand versus the right hand. Feedback is given to the user with two different strategies. One time by an abstract bar feedback, and the second time by a 3-D virtual reality environment: The left and right hand of an avatar in the 1st person's perspective in presented to him/her. If a motor imagery is detected, the according hand of the avatar moves. Preliminary tests were done on three healthy subjects. Offline analysis was then performed to (1) demonstrate the feasibility of the new, immersive, 3-D feedback strategy, (2) to compare it with the quite common bar feedback strategy and (3) to optimize the classification algorithm that detects the MI.

A Robotic & Virtual Reality Orthopedic Rehabilitation System for the Forearm

Miguel A. Padilla-Castaneda[a,1], Edoardo Sotgui[a] and Antonio Frisoli[a] and Massimo Bergamasco[a]

[a]Perceptual Robotics Laboratory (PERCRO), Scuola Superiore Sant'Anna, Italy

[1]*Corresponding author*:
Miguel A. Padilla-Castaneda
m.padillacastaneda@sssup.it

Abstract

We describe a robotic and virtual reality system for the rehabilitation of the forearm. It consists of a robotic arm and VR scenarios with a dynamic model of the human upper limb. The system allows to assign specific tasks to perform within the virtual environments. The system simulates the actions of the patient limb and allows exhaustive exercising and motor control, giving visuomotor and haptic feedback and trajectory positioning guidance. The system aids to evaluate the mobility condition of the patient, to personalize the difficult level of the therapy and provides kinematic measures of the patient evolution. The patients recruitment phase has already started for clinical pilot studies.

Immersive Virtual Environment for Visuo-Vestibular Therapy: Preliminary Results

J.D. Gascuel[a], H. Payn[a], S. Schmerber[b] and O. Martin[c,1]

[a]LJK (UMR5224 CNRS and Grenoble University), INRIA
[b]Grenoble University Hospital ENT Clinic and Grenoble University
[c]GIPSA-Lab (CNRS UMR5216 and Grenoble University)

[1]*Corresponding author*:
Olivier Martin
Olivier.Martin@ujf-grenoble.fr

Abstract

The sense of equilibrium aggregates several interacting cues. On vestibular areflexic patients, vision plays a major role. We developed an immersive therapeutic platform, based on 3D opto-kinetic stimulation that enables to tune the difficulty of the balance task by managing the type of optic flow and its speed. The balance adjustments are recorded by a force plate, quantified by the length of the center of pressure trajectory and detection of disequilibrium corrections (leans, compensation step). Preliminary analysis shows that (i) patients report a strong immersion feeling in the motion flow, triggering intense

motor response to “fight against fall”; (ii) the ANOVA factorial design shows a significant effect of flow speed, session number and gaze anchor impact. In conclusion, this study shows that 3D immersive stimulation removes essential limits of traditional opto-kinetic stimulators (limited 2D motions and remaining fixed background cues). Moreover, the immersive optic flow stimulation is an efficient tool to induce balance adaptive reactions in vestibular patients. Hence, such a platform appears to be a powerful therapeutic tool for training and relearning of balance control processes.

On the Comparison of VR-responses as Performance Measures in Prospective Memory with Auditory P300 Responses in MCI Detection

Ioannis Tarnanas[a,1], Nikos Laskaris[b] and Magda Tsolaki[a]

[a]Aristotle University of Thessaloniki, Medical School, Thessaloniki, Greece
[b]Aristotle University of Thessaloniki, Department of Informatics, Thessaloniki, Greece

[1]*Corresponding author*:
Ioannis Tarnanas
i.tarnanas@vrethics.com

Abstract

Patients with amnestic mild cognitive impairment are at high risk for developing Alzheimer's disease. Besides episodic memory dysfunction they show deficits in accessing contextual knowledge that further specifies a general spatial navigation task or an executive function (EF) virtual action planning. There has been only one previous work with virtual reality and the use of a virtual action planning supermarket for the diagnosis of mild cognitive impairment. The authors of that study examined the feasibility and the validity of the virtual action planning supermarket (VAP-S) for the diagnosis of patients with mild cognitive impairment (MCI) and found that the VAP-S is a viable tool to assess EF deficits. At our study we used a virtual action planning museum (VAP-M) and a sample of 20 MCI and 20 controls, in order to investigate deficits in spatial navigation, prospective memory and executive function. Furthermore, we used the late component of the cognitive event-related potential (ERP), P300, as a marker for cognitive brain functions in order to examine whether there is a correlation between the changes in P300 parameters and the type and severity of dementia, and to determine P300 abnormalities in MCI. Our data highlight that both the virtual action planning museum (VAP-M) and P300 averages were able to differentiate between healthy elders and patients with amnestic mild cognitive impairment and agree with the findings of the virtual action planning supermarket (VAP-S). The sensitivity was 100% and the specificity 98% for the VAP-M to correctly identify MCI, whereas using P300 prolonged latencies, sensitivity was 87% to 95% (specificity, 90% to 95%). According to the literature cognitive event-related brain potential (ERP) studies are proven to advance the early detection and diagnosis of "presymptomatic AD". To our knowledge this is the first study to correlate virtual action planning museum (VAP-M) and P300 averages for MCI detection.

A Pilot Study Comparing Visual Motor Skills of adults with and without Learning Disabilities Using A Hapto-VisualVirtual Reality Tool

Line Tremblay[a,1], Brahim Chebbi[a], Stéphane Bouchard[b], Krystel Cimon-Lambert[a] and JEessica Carmicael[a]

[a]Laurentian University
[b]Université de Québec en Outaouais

[1]*Corresponding author*:
Line Tremblay
ltremblay@laurentian.ca

Abstract

The present study explores the use of virtual reality (VR) for visual-motor skills testing with adults. This tool is a VR version of the common board game Operation and requires the user to lift organs from enclosures in a replica of human body using a hapto-visual system. A sample of 22 male and female students with (n=11) and without (n=11) Learning Disabilities (LD) had their visual-motor skills pre-tested using a standard paper pencil measure and were compared according to their performance on the VR tool. Results showed that participants without LD performed better and more rapidly on the VR task than participants with LD. The participants’ paper pencil scores did not correlate with their performance on the VR tool, suggesting that different visual-motor skills are recruited for each task.

HIGH TECH THERAPY FOR A LOW TECH THERAPIST

The Use of Virtual Reality in the Treatment of Eating Disorders

Marta Ferrer Garcia[a,1] and José Gutiérrez-Maldonado[a]

[a]Universidad de Barcelona, Spain

[1]*Corresponding author*:
Marta Ferrer Garcia
martaferrerg@ub.edu

Abstract

A high percentage of patients with eating disorders (ED) respond to treatments such as cognitive-behavioural therapy. However, some patients do not progress significantly with these treatments, or suffer relapses. The incorporation of new technologies may help to increase the efficacy of standard treatments. Virtual reality has been successfully used to treat body image disturbances in ED patients and seems a suitable technology for cue exposure therapy in this setting. We review the published literature and discuss the results.

Guided Internet Treatment for Anxiety Disorders: As Effective as Face-to-Face Therapies?

Gerhard Andersson[a,1]

[a]Department of Behavioural Sciences and Learning, Linköping University and Department of Clinical Neuroscience, Karolinska Institute, Sweden

[1]*Corresponding author*:
Gerhard Andersson
Gerhard.Andersson@liu.se

Abstract

Introduction: Guided Internet-delivered treatments were developed in the late 1990s and have since been tested in numerous controlled trials. While promising, there are yet few direct comparisons between Internet treatments and traditional face-to-face treatments. The aim of the present study is to present an overview of the evidence in the field of anxiety disorders. Method: Studies were located, including unpublished trials from our research group in Sweden. Results: Results of direct comparative trials on panic disorder (n=3) and social anxiety disorder (n=3) show equivalent outcomes. One study on specific phobia did not show equivalent outcomes with an advantage for face-to-face treatment. However, a systematic review by Cuijpers et al. (2010) found equivalent outcomes across several self-help formats, suggesting that guided self-help overall can be as affective as face-to-face treatments. Conclusion: Overall, there are still few large-scale trials and statistical power is often limited. A preliminary conclusion is that guided Internet treatment can be as effective as face-to-face treatments, but there is a need to investigate moderators and mediators of the outcome.

In Vivo versus Augmented Reality Exposure in the Treatment of Small Animal Phobia: A Controlled Study

J.M. Bretón-Lopez[a], M.A. Pérez-Ara[a], S. Quero[a,b], A. García-Palacios[a,b] and C. Botella[a,b,1]

[a]Universitat Jaume I
[b]CIBER de Fisiopatología de la Obesidad y Nutrición (CIBEROBN)

[1]*Corresponding author*:
Cristina Botella
botella@uji.es

Abstract

In vivo exposure (IVE) is the treatment of choice for specific phobias. However, not all patients benefit from it. Virtual reality (VR) has proved to be effective for exposure in phobia treatment. Augmented Reality (AR) is a variation of VR in which the user sees the real world augmented by various virtual elements. Only preliminary data about AR utility for the treatment of insect phobias are available. The present work presents the results obtained in a between group controlled study that compares the differential efficacy of two treatment conditions: IVE versus AR exposure (ARE). Sixty-four participants were randomly assigned to each treatment condition: IVE (N=31) and ARE (N=33). The treatment consists in "one-session treatment" following the guidelines by Öst group. Repeated measures analyses of variance (ANOVAs) revealed that time effects were significant for all outcome measures at post-treatment and at 3 and 6 months follow-ups. In addition, comparison between the two treatment conditions showed that participants in the IVE condition reached higher improvement in one of the measured variables ("avoidance of the main target behavior") at post-treatment and 3-month follow-up. However no differences were found at 6-month follow-up in any of the measured variables. This work provides further support for the efficacy of AR as a tool for phobia therapy.

Adapting Computerized Treatments into Traditional Psychotherapy for Depression

James Overholser[a,1]

[a]Case Western Reserve University, Cleveland Ohio USA

[1]*Corresponding author*:
James Overholser
overholser@case.edu

Abstract

Recent developments in technology have helped to improve the process of psychotherapy. Unfortunately, many therapists lack the computer skills or financial resources needed for the newest technology. Nonetheless, even basic advances in technology may help to improve the treatment of depression.

Method: The literature is reviewed for journal articles on the treatment of depression published during the past seven years in which treatments have been guided by technology.

Results: Six novel findings are summarized that may be helpful even when the therapist lacks skill or resources for advanced technology. 1) The efficient assessment of depression can be facilitated by technology, whether using standardized measures or simple daily ratings of mood. 2) Technology tools can be used to send semi-automated daily reminders to help clients develop more adaptive habits in thoughts or actions. 3) Depressed clients can begin to confront their negative view of self, often triggered by some form of loss, failure, or rejection, whether real, imagined, or anticipated. 4) Clients can confront their problems through therapeutic dialogue, whether conducted in person, over the telephone, or via video conference. 5) Clients can use writing assignments to identify, label, explore and express their thoughts and feelings. These writing assignments can be conducted via paper, email, or internet forms. 6) Clients value rapport with a therapist, and this bond seems important to ensure participation and adherence with treatment.

Conclusion: Even low-tech therapists can strengthen the treatment of depression using basic technology tools to replace, extend, or supplement traditional sessions. However, it is important to protect the rapport needed for sustained participation in therapy.

Mechanisms of Change in Virtual Reality Therapies

David Opri[a,1]

[a]Babeş-Bolyai University, Cluj-Napoca, Romania

[1]*Corresponding author*:
David Opri
david.opris@ubbcluj.ro

Abstract

Along the efficacy and effectiveness data, mechanisms of change analysis are an important part of the validation of an evidence-based psychotherapy. A review of the studies investigating potential mechanisms of change in virtual reality psychotherapy (e.g. cognitive mechanisms, psychophysiological mechanisms, therapeutic alliance) will be presented. We will also address factors which moderate the efficacy of virtual reality interventions. The relevance of the virtual reality interventions regarding the research and practice of psychotherapy is discussed.

NEW APPROACHES AND TRENDS IN CYBERTHERAPY

Assessment of Executive Functions in Patients with Obsessive Compulsive Disorder by NeuroVR

Filippo La Paglia[a,1], Caterina La Cascia[a], Rosalinda Rizzo[a,b], Giuseppe Riva[c] and Daniele La Barbera[a]

[a]Department of Experimental Biomedicine and Clinical Neuroscience, University of Palermo, Italy
[b]Department of Pedagogical and Psychological Sciences, University of Messina, Italy
[c]Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano, Milan, Italy

[1]*Corresponding author*:
Filippo La Paglia
filippo.lapaglia@unipa.it

Abstract

Executive functions are often impaired in obsessive-compulsive disorder (OCD). We used a Virtual Reality version of the Multiple Errand Test (VMET) - developed using the free NeuroVR software (http://www.neurovr.org) - to evaluate the executive functions in daily life in 10 OCD patients and 10 controls. It is performed in a shopping setting where there are items to be bought and information to be obtained. The execution time for the whole task was higher in patients with OCD compared to controls, suggesting that patients with OCD need more time in planning than controls. The same difference was found in the partial errors during the task. Furthermore, the mean rank for and for interpretation failures is higher for controls, while the values of divided attention and the of self correction seems to be lower in controls. We think that obsessive patients tend to work with greater diligence and observance of rules than controls. In conclusion, these results provide initial support for the feasibility of VMET as assessment tool of executive functions. Specifically, the significant correlation found between the VMET and the neuropsychological battery support the ecological validity of VMET as an instrument for the evaluation of executive functions in patients with OCD.

Bottom-Up and Top-Down Influences of Beliefs on Emotional Responses: Fear of Heights in a Virtual Environment

Andreas Mühlberger[a,1], Roland Neumann[b], Ljubica Lozo[b], Mathias Müller[a] and Marc Hettinger[a]

[a]Department of Psychology, University of Würzburg
[b]Department of Psychology, University of Trier

[1]*Corresponding author*:
Andreas Mühlberger
muehlberger@psychologie.uni-wuerzburg.de

Abstract

According to cognitive approaches in emotion research, emotions hinge on beliefs that can be true or false. We suggest that emotionally relevant beliefs can be influenced bottom-up e.g. by the depth cues of a virtual environment or top-down e.g. by reappraisal strategies. Our research question is if bottom-up and top-down processes influence the same belief structure or if different belief structures are responsible for bottom-up and top-down influences on emotions. To test these assumptions we exposed participants to a virtual environment that is able to elicit fear of heights and manipulated reappraisal for half of the participants. Moreover, we presented virtual scenes of heights in a monoscopic (less depth cues) and stereoscopic (more depth cues) mode in order to influence the confirmatory processes that are associated with beliefs. Subjective intensity of discomfort and the bending angle as a behavioural response were measured. We observed that although the depth cues and the reappraisal strategy were both effective in reducing the feeling of discomfort, reappraisal and the mode of presentation exert independent effects. Thus, beliefs that are triggered by bottom-up processes (depth cues) change emotions independent of the beliefs triggered by top-down processes (reappraisal).

Socially Anxious People Reveal More Personal Information with Virtual Counselors That Talk about Themselves using Intimate Human Back Stories

Sin-Hwa Kang[a,1] and Jonathan Gratch[a]

[a]Institute for Creative Technologies, University of Southern California

[1]*Corresponding author*:
Sin-Hwa Kang
sinhwa.kang@gmail.com

Abstract

In this paper, we describe our findings from research designed to explore the effect of virtual human counselors' self-disclosure using intimate human back stories on real human clients' social responses in psychological counseling sessions. To investigate this subject, we designed an experiment involving two conditions of the counselors' self-disclosure: human back stories and computer back stories. We then measured socially anxious users' verbal self-disclosure. The results demonstrated that highly anxious users revealed personal information more than less anxious users when they interacted with virtual counselors who disclosed intimate information about themselves using human back stories. Furthermore, we found that greater inclination toward facilitated self-disclosure from highly anxious users following interaction with virtual counselors who employed human back stories rather than computer back sto-

ries. In addition, a further analysis of socially anxious users' feelings of rapport demonstrated that virtual counselors elicited more rapport with highly anxious users than less anxious users when interacting with counselors who employed human back stories. This outcome was not found in the users' interactions with counselors who employed computer back stories.

Changing Heartbeat Perception to Induce Anxiety in Virtual Environments

Luca Chittaro[a,1]

[a]Human-Computer Interaction Lab,
University of Udine, Italy

[1]*Corresponding author*:
Luca Chittaro
luca.chittaro@uniud.it

Abstract

In this paper, we first propose a general technique to induce anxiety in virtual environments (VEs) which exploits auditory heartbeat perception and biofeedback. Then, we consider a VE that reproduces a real-world anxiety-inducing experience (being suddenly surrounded by smoke during a fire evacuation of a building), and we describe an experiment that contrasts 3 conditions: (i) an augmentation of the VE with a bar that indicates when the user's avatar gets hurt, (ii) an augmentation of the VE with the typical audio visual stimuli which are employed in violent videogames when the user's avatar gets hurt, (iii) introduction of the proposed biofeedback technique in the previous condition. We carry out an electrodermal analysis showing that the introduction of the proposed technique produces much higher physiological arousal in terms of skin conductance level (SCL) than the other two conditions. Subjective measures of users' state anxiety are consistent with the recorded physiological reactions.

Improving Social Behaviour in Schizophrenia Patients using an Integrated Virtual Reality Programme: A Case Study

M. Rus-Calafell[a,b,1], J. Gutiérrez-Maldonado[a]
and J. Ribas-Sabaté[b]

[a]Department of Personality, Assessment & Psychological Treatments, Faculty of Psychology,
University of Barcelona, Spain
[b]Department of Psychiatry and Mental Health,
Igualada General Hospital, Spain

[1]*Corresponding author*:
Mar Rus Calafell
mruscalafell@ub.edu

Abstract

Social skills training programmes are among the treatments of choice in schizophrenia. Virtual reality (VR) can improve the results obtained with traditional social skills programmes by helping to generalize the acquired responses to patients' daily lives. We present the results of a case study involving the application of an integrated VR programme for social skills training. A 30-year-old woman with a well-established diagnosis of schizophrenia was enrolled in the study. She completed four baseline sessions, 16 treatment sessions and four follow-up sessions three months after the end of the treatment. Using a multiple baseline across-behaviours design, three target behaviours were analysed: facial emotion recognition, social anxiety and conversation time. Symptoms and social function variables were also assessed. The results showed a positive change in the three target behaviours and improvements in interpersonal communication, assertiveness and negative symptoms. The VR programme proved useful for training the patient's social behaviour and, consequently, for improving her performance.

Associations Between Facial Emotion Recognition, Cognition and Alexithymia in Patients with Schizophrenia using a Virtual Reality Task

J. Gutiérrez-Maldonado[a], M. Rus-Calafell[a,b],
S. Márquez-Rejón[a] and J. Ribas-Sabaté[b]

[a]Personality, Assessment, Psychological Treatments Department, Faculty of Psychology, University of Barcelona, Spain

[1]*Corresponding author*:
José Gutiérrez-Maldonado
jgutierrezm@ub.edu

Abstract

It is commonly known that emotion recognition is impaired in schizophrenia patients. Furthermore, cognitive deficits and symptomatology have been associated with this impairment; but there are other patient characteristics that have not been widely explored, such as alexithymia. Photographs are the materials most frequently used for their assessment, but they do not reproduce the dynamism of human expressions. Our group has designed and validated a virtual reality task to assess and subsequently train schizophrenia patients. The aim of the present study is to evaluate the impaired recognition of facial affect in patients who suffer schizophrenia and its association with cognitive deficit and their inability to express feelings using a virtual reality task. Thirty clinically stabilized outpatients with a well-established diagnosis of Schizophrenia or Schizoaffec-

tive disorder were assessed in neuropsychological, symptomatological and affective domains. They then responded to the Virtual Reality Facial Emotion Recognition task. Statistical analyses revealed no significant differences between the two presentation conditions (photographs and VR) in overall errors made; however, anger and fear were easier to recognize in VR than in photographs. Moreover, strong correlations between psychopathology and errors made were found. This study demonstrates that VR can be a useful tool to assess and train patients with facial emotion recognition impairment.

Virtual Worlds and Avatars as the New Frontier of Telehealth Care

J. F. Morie[a,1], E. Haynes[a], E. Chance[a] and D. Purohit[a]

[a]University of Southern California, Institute for Creative Technologies

[1]*Corresponding author*:
Jacquelyn Morie
morie@ict.usc.edu

Abstract

We are entering a new age where people routinely visit, inhabit, play in and learn within virtual worlds (VWs). One in eight people worldwide are VW participants, according to the latest 2011 figures from KZERO [1]. VWs are also emerging as a new and advanced form of telehealth care delivery. In addition to existing telehealth care advantages; VWs feature three powerful affordances that can benefit a wide range of physical and psychological issues. First, the highly social nature of VWs encourages social networking and the formation of essential support groups. Secondly, the type of spaces that have been proven in the physical world to promote psychological health and well-being can be virtually recreated. Finally, research suggests that embodied avatar representation within VWs can affect users psychologically and physically.

These three aspects of VWs can be leveraged for enhanced patient-client interactions, spaces that promote healing and positive responses, and avatar activities that transfer real benefits from the virtual to the physical world. This paper explains the mounting evidence behind these claims and provides examples of VWs as an innovative and compelling form of telehealth care destined to become commonplace in the future.

HUMAN COMPUTER CONFLUENCE APPLICATIONS IN THERAPY AND REHABILITATION

Inter-Reality in the Evaluation and Treatment of Psychological Stress Disorders: the INTERSTRESS Project

Pietro Cipresso[a,1], Andrea Gaggioli[a], Silvia Serino[a], Simona Raspelli[a], Cinzia Vigna[a], Federica Pallavicini[a] and Giuseppe Riva[a]

[a]Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano, Milan, Italy

[1]*Corresponding author*:
Pietro Cipresso
p.cipresso@auxologico.it

Abstract

"Psychological stress" occurs when an individual perceives that environmental demands tax or exceed his or her adaptive capacity. According to the Cochrane Database of Systematic Reviews, the best validated approach covering both stress management and stress treatment is the Cognitive Behavioral (CBT) approach. CBT has undergone a very large number of trials in research contexts. However, it has been less efficacious in clinical contexts and it has become obvious that CBT has some failings when applied in general practice. INTERSTRESS is a EU-funded project that aims to design, develop and test an advanced ICT-based solution for the assessment and treatment of psychological stress that is able to address three critical limitations of CBT: a) the therapist is less relevant than the specific protocol used. b) the protocol is not customized to the specific characteristics of the patient; c) the focus of the therapy is more on the top-down model of change (from cognitions to emotions) than on the bottom-up (from emotions to cognitions).

To reach this goal the INTERSTRESS project applies an innovative paradigm for e-health – Interreality – that integrates assessment and treatment within a hybrid environment, bridging physical and virtual worlds. On one side, the patient is continuously assessed in the virtual and real worlds by tracking the behavioral and emotional status in the context of challenging tasks (customization of the therapy according to the characteristics of the patient). On the other side, feedback is continuously provided to improve both the appraisal and the coping skills of the patient through a conditioned association between effective performance state and task execution behaviors (improvement of self efficacy). Within this conceptual framework, it is possible to set up and test psychological treatments that could be extended also beyond the traditional research and clin-

ical setting by using more and more emerging mobile technology to deliver real-time interventions during daily activities and ecological contexts.

ICT4Depression

H. Riper[a,1], L. Warmerdam[b], W. Seekles[a], M. Klein[c] and P. Cuijpers[b]

[a]GGZinGeest, research department, Amsterdam
[b]VU University, department of Clinical Psychology, Amstrdam
[c]VU University, department of Artificial Intelligence, Amsterdam

[1]*Corresponding author*:
Helen Riper
info@heleenriper.com

Abstract

Depression is expected to be the disorder with the highest disease burden in high-income countries by the year 2030. ICT4Depression is a European KP7 project that aims to contribute to alleviate this burden by making smart use of depression treatment and ICT innovations. In this project we developed an ICT-based system for use in primary care that aims to improve access as well as actual care delivery for depressed adults. This system supports (guided) self-help depression treatment in primary (GP) care via (1) the internet and smart phones within (2) a stepped care framework and by making use of (3) ecological momentary assessment and intervention techniques (EMA and EMI) including the assessment of physiological symptoms in an integrated manner (4) which enables timely interactive feedback and treatment adaptation if needed for patients and professionals alike. The self-help treatment program developed within the ICT4Depression project is called Moodbuster. The general objective of the ICT4Depression project is to test the feasibility and effectiveness of Moodbuster within a pilot study in Sweden and the Netherlands 2012. Our presentation will focus on the design of the intervention and study as well as the preliminary results of three pilots in which the project partners have participated. Next, we will discuss our plans for a future multi-site randomized controlled trial and subsequent implementation endeavours on the basis of these results.

Auditory-Visual Integration of Emotional Signals in a Virtual Environment for Cynophobia

Marine Taffou[a,1], Emmanuelle Chapoulie[b], Adrien David[b], Rachid Guerchouche[b], George Drettakis[b] and Isabelle Viaud-Delmon[a]

[a]UMR 9912 CNRS IRCAM UPMC, 1 place Igor Stravinsky, 75004 Paris, France
[b]REVES INRIA, Sophia Antipolis, France

[1]*Corresponding author*:
Marine Taffou
marine.taffou@ircam.fr

Abstract

Cynophobia (dog phobia) has both visual and auditory relevant components. In order to investigate the efficacy of virtual reality (VR) exposure-based treatment for cynophobia, we studied the efficiency of auditory-visual environments in generating presence and emotion.

We conducted an evaluation test with healthy participants sensitive to cynophobia in order to assess the capacity of auditory-visual virtual environments (VE) to generate fear reactions. Our application involves both high fidelity visual stimulation displayed in an immersive space and 3D sound. This specificity enables us to present and spatially manipulate fearful stimuli in the auditory modality, the visual modality and both.

Our specific presentation of animated dog stimuli creates an environment that is highly arousing, suggesting that VR is a promising tool for cynophobia treatment and that manipulating auditory-visual integration might provide a way to modulate affect.

Human Computer Confluence Applied in Healthcare and Rehabilitation

Isabelle Viaud-Delmon[a,1], Andrea Gaggioli[b], Alois Ferscha[c] and Stephen Dunne[d]

[a]1IRCAM CNRS UPMC - UMR 9912, Paris, France
[b]Università Cattolica del Sacro Cuore di Milano, Italy
[c]Institute for Pervasive Computing, Johannes Kepler University Linz, Austria
[d]Starlab, Barcelona, Spain

[1]*Corresponding author*:
Isabelle Viaud-Delmon
isabelle.viauddelmon@gmail.com

Abstract

Human computer confluence (HCC) is an ambitious research program studying how the emerging symbiotic relation between humans and computing devices can enable radically new forms of sensing, perception, interaction, and understanding. It is an interdisciplinary field, bringing together researches from horizons as various as pervasive computing, bio-signals processing, neuroscience, electronics, robotics, virtual & augmented reality, and provides an amazing potential for applications in medicine and rehabilitation.

Annual Review of Cybertherapy and Telemedicine 2011

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The field of cybertherapy is becoming more widely accepted and implemented worldwide. The advantages that tele-health and mobile health have to offer, such as more readily accessible medical records, reliable user-friendly health advice on demand and patient-centric care are undeniable, and have resulted in exciting advances in how the needs of patients and caregivers alike are addressed. Better educated patients are becoming more responsible and proactive, taking charge of their own health and adopting and adhering to healthier lifestyle choices, and the goal of a healthy population and more efficient and effective healthcare becomes more attainable each day.

This book presents contributions from researchers and practitioners in the field of cybertherapy which not only illustrate the progress made in treating a variety of disorders, but also identify the challenges still faced in this field; such as the development of easy to use and more affordable hardware and software as well as the need to address potential side-effects and implement more controlled evaluation of cybertherapies as compared to more traditional treatments.

The book, which will be of interest to health professionals and patients alike, is divided into four sections: Critical Reviews contains summaries and evaluations of emerging cyber therapy topics; Evaluation Studies includes chapters which undertake to solve some specific practical problems and assess the value of cybertherapy interventions; Original Research addresses new cybertherapy methods or approaches; finally, Clinical Observations explores case studies and research protocols with long-term potential.

Contents:

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POSTER PRESENTATIONS

Breast Assessment in a Mixed Reality Environment through Tactile Perception

Sylvester Arnab[a,1] and Mitan Solanki[b]

[a]Serious Games Institute, Coventry University, UK
[b]The University of Warwick, UK

[1]*Corresponding author*:
Sylvester Arnab
sarnab@cad.coventry.ac.uk

Abstract

The proposed paper will report on the pedagogy-driven simulator towards supporting tactile perception in a virtual environment, and the preliminary findings within the context of a mixed-reality environment for breast awareness. Supporting experiential and exploratory models of learning, this paper describes the importance of combining different sensory elements to facilitate learning. By introducing tactile interfaces with real and virtual (i.e. augmented) reality in conjunction with the "hands-on" instructional approach, as opposed to reading literature on the subject, it is envisaged that learner perceptions will be more immersed and the gap between virtual and real spaces will be bridged by deeper involvement of the learner. The novelty of this work lies in the amalgamation of augmented reality with the sense of touch alone (not visuals), and in this application to breast assessment. A real silicone medium is embedded with virtual lesions that are sensed through a haptic force feedback interface. This method not only expands the training curriculum by offering the simulation of rare cases, but it also provides the capability to quantitatively monitor user performance in breast assessment. Early findings from the work in breast assessment demonstrate that various configurations of breast anomalies can be supported, accurately detected and real learning outcomes may be promoted in a mixed platform.

"Butler System" a Social Technological Platform for Elderly People: Analyzing its Efficacy in Mood State and its Social Effects in their Users

Ernestina Etchemendy[a,b,1], Rosa María Baños[a,b], Diana Castilla[a,c], Silvia Felipe[b] and Cristina Botella[a,c]

[a]CIBER de Fisiopatología de la Obesidad y Nutrición (CIBEROBN)
[b]Universidad de Valencia (Spain)
[c]Universidad Jaume I (Spain)

[1]*Corresponding author*:
Ernestina Etchemendy
ernestina@labpsitec.es

Abstract

The "Butler System" is an e-health technological platform especially adapted to the elderly population and addressed to improve their quality of life through the use of ICTs. Its main goals are to reduce the digital gap between elderly people, to promote a successful aging expanding of social network and new entertainment spaces. The goal of the present work is, to analyze the efficacy of the Butler system to improve positive mood and analyze its social effects in a sample of 14 participants (64 to 92 years old) during 6 sessions. The participants were recruited from a residence and an adult day health care center. The users completed the following questionnaires: before and after the use of the tool, Visual-Analogic-Scale (joy, sadness, anxiety, relax) and General-Mood-State-Scale. Furthermore, they answered two questions ("To what extent did the Butler system help you feel your family, friends more nearby?", "To what extent, did you find enjoyable the Butler System?") in the last session with the system. Results show a significant increase of positive mood and mood state, significant decrease in negative moods and high level of satisfaction in all session. Regarding the general questions, the results show that the system helped participants feel more nearby to their significant people and that the experience was enjoyable. The Butler System can be a powerful tool to contribute to a successful aging and to facilitate the construction of protective resources, such as increasing connexions in their social network and pleasant activities.

Smartphone Based Detection of Stress-Related Behavior Changes in Daily Life Scenarios

Gerald Bauer[a,1], Jens Weppner, Andrea Gaggioli[a,b], Pietro Cipresso[b], Silvia Serino[b] and Paul Lukowicz[a]

[a]Embedded Systems Lab, University of Passau, Innstrasse 43, 94032 Passau
[b]Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano

[1]*Corresponding author*:
Gerald Bauer
gerald.bauer@uni-passau.de

Abstract

This paper introduces a novel approach to detect stressful situations in everyday life scenarios using one of the most unobtrusive sensors on the market today: a smartphone. As carrying a mobile phone is common practice nowadays, these devices are a feasible means to monitor long-term behavior. By captur-

ing and analyzing built-in sensors data, it is possible to collect a whole host of daily contextual and behavioral information, such as communication behavior, location patterns and Apps/Internet usage patterns. The main goal of this ongoing research is to investigate the relationship between contextual and behavioral data and self-reported psychological stress. To this end, we designed and developed an Android-based smartphone application, which allows sampling user's experience and correlate this information with sensors and activity data unobtrusively collected during user's daily life. A first prototype of our system was already used to detect these stress-related contextual and behavioral patterns in a study lasting several weeks, during which participants were exposed to long-term stressful situations (preparation of university exams) [1]. Taking this approach a step further, our aim is to use the final version of our system to detect short-term stress periods (i.e. single stress events). Here, we report preliminary results of a study in which we continuously recorded behavior, contextual and self-reported psychological data from 10 students during a 3-month period.

A Wearable Real-time Physiological and Behavioural Monitoring System for Stress Analysis and Treatment

Nicola Carbonaro[a,1], Alessandro Tognetti[a], Gaetano Anania[a], Gabriele Dalle Mura[a] and Danilo De Rossi[a]

[a]Interdepartmental Research Center "E.Piaggio", University of Pisa, Pisa, Italy

[1]*Corresponding author*:
Nicola Carbonaro
nicola.carbonaro@centropiaggio.unipi.it

Abstract

A wearable system able to perform acquisition and real-time elaboration of physiological and behavioral parameters of a patient affected by stress was designed and developed. This Personal Biomonitoring System (PBS) is a platform that will be available to the patient during daily activities and will collect, fuse and analyze patient behavior and physiological status. This work was carried out within the European Collaborative Project INTERSTRESS. This project is aimed at designing and developing advanced simulation and sensing technologies for the assessment and treatment of psychological stress, using a platform based on mobile biosensors. In this context, this wireless PBS will unobtrusively perform a real-time monitoring of heart rate (HR), heart rate variability (HRV) and breathing rate (BR), as meaningful physiological parameters for stress correlation. Moreover the PBS will carry out a continuous tracking of activity level and posture of the patient, as behavioral parameter for user contextual identification. Data extracted by the PBS are sent to a smartphone/tablet, which will perform a local biofeedback strategy or a provisional stress analysis. In this paper the main concept of the PBS platform is reported. The aim of the study is to integrate robust algorithms in a mobile and wearable device, where low power microcontroller is required. The whole system was designed focusing on the main characteristic such as usability, user comfort and wearability, without leaving out the importance to achieve reliable and robust parameter. The proposed system is a suitable solution for the investigation of the mental stress correlation to physiological parameters.

The Effects of Computerized Evaluative Conditioning on Changing Implicit Attitudes Toward Alcohol

Yoon Jung Choi[a,1] and Jang-Han Lee

[a]Department of Psychology, Chung-Ang University

[1]*Corresponding author*:
Yoon Jung Choi
choiyj2010@hanmail.net

Abstract

Evaluative conditioning (EC) refers to attitude formation or change due to an object's pairing with positively or negatively valenced stimuli. In the present study, we examined whether changes in explicit attitudes and implicit approach tendency toward alcohol can be achieved after computer-simulated EC procedure. Participants consisted of heavy social drinkers (HSDs, N=20) and light drinkers (LDs, N=15) who were assessed using self-report questionnaires and approach-avoidance alcohol Implicit Association Test (approach-avoidance alcohol IAT). Results indicated that HSDs showed higher scores on explicit alcohol cravings and more implicit approach tendency toward alcohol-related stimuli than LDs. Also, EC successfully reduced explicit craving and implicit approach tendency in both groups. Results from the self-report questionnaires indicated weaker alcohol cravings after EC procedure in both groups. The results showed stronger implicit avoidance tendency toward alcohol after EC procedure in both groups. These results demonstrated that EC technique may be used in alcohol addiction therapy and healthcare settings by changing explicit and implicit attitudes toward alcohol in light drinkers as well as heavy drinkers. Therefore, EC may prove to be an alternative option for the prevention and treatment of alcohol misuse.

An Ubiquitous Platform for Fear of Flying Research

Silvia Serino[a], Pietro Cipresso[a,1], Cinzia VignaPietro Cipresso, Andrea Gaggioli[a] and Giuseppe Riva[a]

[a]Applied Technology for Neuro-Psychology Lab, IRCCS Istituto Auxologico Italiano, Via Pellizza da Volpedo 41, 20149 Milan, Italy

[1]*Corresponding author*:
Pietro Cipresso
p.cipresso@auxologico.it

Abstract

Fear of flying is a complex phenomenon involving various maladaptive psychological, physiological and behavioral aspects. Commonly, fear of flying could be defined as an irrational amount of anxiety directed to the flight experience that the individuals feel compelled to avoid. New advanced technologies have offered the chance of developing integrated clinical protocols to manage fear of flying. We propose an integrated approach to support fear of flying treatment by building an ubiquitous platform (http://www.stopfear.eu) based on the three elements: (a) e-learning platform; (b) a social network site; and (c) a mobile application. A Formative Evaluation has been carried out on 10 participants to test the usability and the functionality of the platform that we developed.

Treatment of Earthquake-related Posttraumatic Symptoms with Virtual Reality

Andreas Dünser[a,1], Janet Carter[a], Martin Dorahy[b] and Eileen Britt[b]

[a]HIT Lab NZ, University of Canterbury
[b]Department of Psychology, University of Canterbury

[1]*Corresponding author*:
Andreas Dünser
andreas.duenser@hitlabnz.org

Abstract

After major earthquakes, many people suffer from posttraumatic symptoms (PTS) as well as anxiety and distress about ongoing aftershocks. Traditional treatments such as in vivo or imaginal exposure may be of limited applicability for earthquake-related symptoms, while others such as cognitive behavioural therapy, may not be short enough to deal with the many people needing rapid help after mass disasters. This project aims to examine how virtual reality exposure therapy (VRET) can help people reduce PTS and strengthen resilience against traumatic stressors. VRET systems are cost-effective, relatively easy to deploy and enable short, focused interventions.

Comparing Virtual Patients with Synthesized and Natural Speech

Alexandre Heitz[a], Andreas Dünser[a,1], Philippa Seaton[b], Lesley Seaton[b] and Arindam Basu[c]

[a]The HIT Lab NZ, University of Canterbury, NZ
[b]School of Nursing and Human Services, Christchurch Polytechnic Institute of Technology, NZ
[c]Health Sciences Centre, University of Canterbury, NZ

[1]*Corresponding author*:
Andreas Dünser
andreas.duenser@hitlabnz.org

Abstract

Virtual Patient (VP) simulations are often designed to use pre-recorded speech in order to provide more realism and immersion. However, using actors for recording these utterances has certain downsides. It can add to the cost during implementation, can take considerable time especially when a large number of VPs have to be created, and is not very flexible for example when sentences or words have to be added frequently. This study aims to explore the use of synthesized speech as an alternative to pre-recorded speech for VPs. Two medical scenarios have been prepared for this study, and both have been implemented using a VP with natural language or with synthesized speech. In a pilot study we explored students' retention rates of the symptoms reported by the VP under both conditions to investigate whether synthesized speech can serve as a good enough alternative.

How to Address a Challenging Audience: The Highly Partecipative Design of a Serious Game about Nightlife Risks

Luciano Gamberini[a,1], Luca Zamboni[a], Alessandro Privitera[a], Gianni De Giuli[a] and Anna Spagnolli

[a]HTLab, Dept. of General Psychology, University of Padova, Italy

[1]*Corresponding author*:
Luciano Gamberini
luciano.gamberini@unipd.it

Abstract

Using a serious game to address young users about nightlife risks represents both a smart communication strategy and a challenging endeavor in which key elements are attention to context and achievement of credibility. We will briefly show how both aspects were considered in our design process.

Computer-assisted Recommendation of Pychological Treatments

Mario Gómez-Martínez[a,1], Cristina Botella[b,d], Rosa Baños[c,d], Azucena García-Palacios[b,d] and Mariano Alcañiz[a]

[a]Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al Ser Humano, Universitat Politècnica de València, I3BH/LabHuman, Camino de Vera s/n, 46022 Valencia, España
[b]Universitat Jaume I, Castellón, Spain
[c]Universidad de Valencia, Spain
[d]Ciber, Fisiopatología de Obesidad y Nutrición, CB06/03 Instituto de Salud Carlos III, Spain

[1]*Corresponding author*:
Mario Gómez-Martínez
mgomez@labhuman.i3bh.es

Abstract

Preliminary study evaluating the use of machine learning algorithms to predict the outcome of several alternative treatments for individual patients. This kind of information will support personalized treatment recommendations.

"Cyber Psychosis": A Case Report

G. Grbesa, V.Radivojevic[a,1] and M. Simonovic[a]

[a]Clinic for Mental Health, Med.fac. University Niš

[1]*Corresponding author*:
Grozdanko Grozdanko
grbesa@eunet.rs

Abstract

The aim of the study is to present the development of psychotic symptoms in subjects addicted to interactive computer games. Development of psychotic symptoms was observed in the frame of theoretical model "Cascade of increasingly Abnormal Function". The subject aged 16, addicted to interactive games, spending more than 18 hours a day by the computer, developed psychosis symptoms. In the initial phase, it included the occurrence of abrupting aggressive manifestations when the parents" intervention prevented his further engagement concerning the computer. The occurrence of hallucinatory experience manifested as the occurrence of vivid images from the computer game content. Hallucinatory voices the subject was resisting were words from the video game ordering "kill him".

Clinical Decision Support System (CDSS) for Non-Specialists Reduces Diabetic Hospital Admissions by More Than 50%

Catherine Woodward[a], Abdul Mohamed[a], Pauline Thomson[a], Fahed Al-Daour[a], Roger Lane[a], Jakob Gunge[b,1] and George Thomson[a,c]

[a]Department of Endocrinology, Kingsmill Hospital, Mansfield, Nottinghamshire, NG17 4JL
[b]Roger Lane Consulting Ltd, Registered Office: Penshurst Cottage, Leigh Road, Havant, Hants, PO9 2 ET
[c]Faculty of Health and Wellbeing, Sheffield Hallam University, City Campus, Howard Street, Sheffield, S1 1WB

[1]*Corresponding author*:
Jakob Gunge
jakob@jaroge.com

Abstract

Many diabetic hospital admissions could be managed in outpatient settings: improving patient experience, bed occupancy and clinical productivity. Current admissions reflect a cautious approach of front-line clinicians who lack specialist knowledge and support. We tested a computer-based CDSS designed to assist decisions and allocate patients to the correct care.

Being Mentally Prepared is Half the Battle

Jakob Gunge[b,1]

[a]Jaroge Ltd

[1]*Corresponding author*:
Jakob Gunge
jakob@jaroge.com

Abstract

Many things in life will take us completely by surprise. Changes in where we live, what we do, having children, forming private and professional relationships, all represent changes that may force us out of our comfort zones.

Dealing with trauma or psychological illness is even more challenging. Whether it is our own or next of kin, it would be useful to be able to experience the new and changed reality of relationship dynamics to what appears to be completely irrational behavior of someone we may feel we no longer know.

Jaroge Ltd has launched an initial pilot into the use of experiential simulation to prepare patients and their next of kin for dramatic change in their lives. The method has been used since

the 1980s for leadership development and change management coaching in soft-skills for professionals. We are not aware of similar techniques being used to increase patient and next-of-kin awareness.

The pilot is in very early phases. We are looking for partners for various aspects of the project. The final objective is to create a commercial application for PTSD and other conditions to which the principles and benefits can apply.

Effects of Distraction using Virtual Reality after a Laparoscopic Bariatric Surgery: a Single Case Study

Kattia Cabas-Hoyos[a], Georgina Cárdenas-López[b], Jose Gutiérrez-Maldonado[a], Ma. Fernanda Ruiz-Esquivel[b] and Gonzalo Torres-Villalobos[c]

[a]University of Barcelona, Faculty of Psychology. Departament of Personality, Assessment and Psychological Treatments
[b]Virtual Teaching and Cyberpsychology Laboratory. National Autonomous University of Mexico. Mexico City, México.
[c]Digestive Disease Clinic and Morbid Obesity. Medica Sur Clinic Foundation. Mexico City, Mexico

[1]*Corresponding author*:
Jose Gutiérrez-Maldonado
kabas_hoy@hotmail.com

Abstract

One of the advantages of the laparoscopic bariatric surgery is the minor post-operatory pain, nevertheless some patients experience high pain. This constitutes a challenge for specialists. The purpose of current study was to determinate the effects of VR Distraction with a 18-years-old patient with bariatric laparoscopic surgery. VR Intervention: standard pharmacological pain management was administered simultaneously with VR Distraction. The patient received a total of 40 minutes of VR Distraction distributed in two sessions. The score of three Visual Analogical Scales and the catastrophic thinking (hopelessness, rumination and magnification) were the dependent variables in the present study. These instruments were administered before and after the intervention with VR Distraction. The patient reported reduction in the levels of pain relative to their baseline scores. The VR intervention led to a significant reduction in hopelessness and rumination. The present study proves that VR can be effective to decrease the physical component of the pain. VR Distraction can enhance the effectiveness of cognitive strategies.

The Effect of Mental Rehearsal on the Generation of Body Swapping Illusion

Hwang Haesol[a,1], Cho Sungkun[a] and Jang-Han Lee[a]

[a]Department of Psychology, Chung-Ang University

[1]*Corresponding author*:
Hwang Haesol
gothf1@gmail.com

Abstract

Illusion of body swapping is perceptive phenomenon in which a virtual (or another) body is perceived as his/her own body. This study aimed to investigate the effects of mental rehearsal on generating the illusion of body swapping. Participants for the study were 18 male undergraduate students at the Chung-Ang University, Seoul, Korea. Participants were randomly assigned to the three groups such as, 'physical rehearsal' group (N=7), 'mental rehearsal' group (N=7) and 'control group' (N=7), respectively. As a result, the groups showed no significant differences in state anxiety, simulator sickness, or immersive tendencies, but did however in body swapping illusion. Subsequent post-hoc analysis revealed that the level of body swapping illusion of the physical rehearsal group and mental rehearsal group are significantly greater than the control group. In conclusion, we found that mental rehearsal exerted similar effects of physical rehearsal on generating the illusion of body swapping. This suggests that the illusion of body swapping through mental rehearsal may be applicable in the clinical settings.

Using Eye-traker to Investigate Unlawful and Lawful Smokers' Attentional Pattern Toward Smoking-related Signs

Saerom Lee[a] and Jang-han[a,1]

[a]Department of Psychology, Chung-Ang University

[1]*Corresponding author*:
Jang-han Lee
clipsy@cau.ac.kr

Abstract

Unlawful smokers are smokers who smoke in non-smoking areas. Although they know that they should not smoke in non-smoking areas, why do they smoke anyway? Many countries indicate non-smoking areas using non-smoking signs. The purpose of this study was to investigate how unlawful-smokers perceive non-smoking signs in non-smoking areas and what is the difference between unlawful-smokers and lawful-smokers using eye-tracker. The stimuli in this study were: (non-) smoking sign and (non-) smoking-related cue at the same time. Here

we show that all smokers looked smoking-related cue such as cigarettes earlier than signs. However, the pattern of visual information processing in signs was different between unlawful- and lawful-smokers. Unlawful-smokers showed longer initial fixation latencies to both non-smoking sign and smoking sign than lawful-smoker. These latencies were not different. In contrast, while lawful-smokers also showed longer latency for non-smoking sign, they showed shorter latency for the smoking sign. This suggests that because unlawful-smokers have much craving, they were not interested in both smoking-sign and non-smoking sign, but because lawful-smoker tend to check for the possibility of smoking, they perceived the smoking-sign. Our findings demonstrate that looking at a non-smoking sign is one of the strategies that showed only lawful-smokers who had sensitiveness to law-observance.

A Pervasive Interaction Platform for Robot-based Social Tutoring

Daniele Mazzei[a,1], Nicole Lazzeri[a], Abolfazl Azaraki[a], Arti Ahluwalia[a] and Danilo De Rossi[a]

[a]Interdepartmental Research Center "E. Piaggio", University of Pisa, Italy

[1]*Corresponding author*:
Daniele Mazzei
mazzei@di.unipi.it

Abstract

Nowadays personality disorders are a social plague leading to segregation and impairment. We should reject the notion that people with personality disorders are beyond help teaching them how to face their social and behavioral difficulties through a social training. As demonstrated by various robotic scientists, high quality human-like robots can be used as emotional conveying systems for training people with social impairments to manage empathic links. For this purpose it is also necessary to analyze how people feel during social interactions and how people interpret human-like signs expressed by social robots.

We developed a software platform for controlling a set of hardware devices which includes a social robot (FACE) used for emotional therapies and various devices used for acquiring and recording data during the human-robot interaction. For evaluating participants' responses and reactions during the experiment, we synchronously and contextually recorded self-report, behavioral and physiological measures.

The integration of the engineering platform HIPOP (Human Interaction Pervasive Observation Platform) with an ad-hoc clinical protocol has led to FACET (FACE Therapy), an infrastructure used for training people with personality and behavioral disorders on understanding and facing social daily life scenarios.

FACET was tested on a panel of normally developing children and children with Autism Spectrum Disorders (ASDs) (aged 6-12 years). This project aimed at designing innovative emotional therapies for people with autism. FACET demonstrated to be well accepted and amusing without inducing stress in subjects with ASDs and reliable in acquiring data with a high resolution and fidelity.

Social Virtual Environments for the Treatment of Social Phobia: Using Different Virtual Reality Displays

Nexhmedin Morina[a,1], Jelmer Beuving[a], Aniek Deiman[a], Isabel L. Kampmann[a], Willem-Paul Brinkman[b], Dwi Hartanto[b] and Paul M.G. Emmelkamp[a]

[a]University of Amsterdam, Department of Clinical Psychology, The Netherlands
[b]Delft University of Technology, Interactive Intelligence Group, The Netherlands

[1]*Corresponding author*:
Nexhmedin Morina
n.morina@uva.nl

Abstract

This study examined levels of the sense of presence and anxiety during exposure to social virtual environments among participants using either a head-mounted display (HMD) or a one-screen projection-based virtual reality display. Participants in both conditions engaged in free speech dialogues with avatars monitored by research assistants. Results revealed that participants in the HMD condition reported higher levels of presence than participants in the one-screen projection-based display condition. However, both groups of participants reported similarly high levels of anxiety during exposure to social virtual environments. The findings indicate that one-screen projection-based displays can successfully activate a phobic fear structure in social virtual environments despite a limited sense of presence. The outcome can prove helpful in using low-cost projection-based virtual reality environments for treating individuals with social phobia.

PABLO As A New Method For Evaluation and Therapy For Hand Pathology

Adriana Sarah Nica[a,b,1], Consuela Monica Brailescu[a,b] and Rodica Gabriela Scarlet[a,b]

[a]National Institute for Rehabilitation, Physical Medicine and Balneology Bucharest, Romania
[b]Physical Medicine and Rehabilitation Department, "Carol Davila" University of General Medicine and Pharmacy, Bucharest, Romania

[1]*Corresponding author*:
Adriana Sarah Nica
consuelabrailescu@yahoo.com

Abstract

Together with other VR medical devices [1 ; 2], Pablo is a new method that can be used for objective evaluation and sensitive, motor and functional rehabilitation for hand deficits resulting from central (stroke, Parkinson) or peripheral (traumatic, post-surgical) neurologic pathology. Pablo system consists in a special device with sensors that allows accurate measurement of all kind of prehension and grips and of all ROM of shoulder/elbow/fist/fingers, with computerized evaluation and graphic evaluation during recovery process [1 ; 2]. This system offers the possibility of interactive games based on Virtual Reality concept with application in occupational therapy programs, that may be performed at home by the patient himself as a continuation of the classic ergotherapy performed under supervision at the Hand Rehabilitation Center.

The Relevance of Game Transfer Phenomena When Addressing Problematic Gaming

Angelica B. Ortiz de Gortaria[a,1] and Mark D. Griffiths[a]

[a]International Gaming Research Unit, Nottingham Trent University, Nottingham, UK

[1]*Corresponding author*:
Angelica B. Ortiz de Gortaria
angelica.ortizdegortari2010@my.ntu.ac.uk

Abstract

Game Transfer Phenomena (GTP) comprise the transfer of videogame experiences into the real world. These experiences can be triggered by the association between real life stimuli and video game elements, resulting in the subsequent alteration of mental processes, sensory perception, impulses or reflexes, automatic behaviors, and/or players' actions based on the content of videogames. GTP studies are in their infancy and at present it is unclear as to which players are susceptible to experiencing GTP. However, empirical data indicate that different individuals have similar experiences when playing the same videogames. Furthermore, findings in two studies suggest that GTP are associated with excessive videogame playing. The first study was based on interviews with 42 Swedish frequent video game players between 15 and 21 years old. Here, some players reported felt the urge to climb buildings, push buttons in the air when something happened in real life, and/or saw text boxes hovering over peoples' heads. In a second study, secondary data analysis of 635 experiences from 463 players collected from online videogame forums found stereotypical mind visualizations, pseudo-hallucinations, and recurrent images in the back of their eyelids of videogame elements. Players also experienced alterations of perception that are considered to be perceptual adaptations, misinterpretation of real life stimuli, and synaesthesia-type of experiences with videogame contents. This paper argues that GTP can contribute to the prevalence of symptoms in gaming addiction, and proposes taking GTP into consideration when addressing problematic gaming.

Movement and Activity Assessed with the Kinect in Sitting Children, and the Influence of Hyperactivity

Annette Conzelmann[a], Andreas Pusch[b], Nadine Hahn[a], Judith Overfeld[a], Markus Nehfischer[a], Matthias Wieser[a], Andreas Warnke[c], Tobias Renner[c], Regina Taurines[c], Marcel Romanos[c], Paul Pauli[a,1] and Andreas Mühlberger[a]

[a]Institute of Psychology, University of Würzburg, Germany
[b]Institute of Human-Computer-Media, University of Würzburg, Germany
[c]Human Clinic for child and adolescence psychiatry, University Hospital of Würzburg Germany

[1]*Corresponding author*:
Paul Pauli
conzelmann@psychologie.uni-wuerzburg.de

Abstract

Movement and activity are major components of patients with Attention Deficit-Hyperactivity Disorder, ADHD. However, studies on movement patterns are still rare. Therefore, we tested the Kinect system for measuring body movements in children with ADHD and controls sitting in front of an immersive projection display (Powerwall) during a rest period. Results showed that patients and healthy controls differed in their movement characteristics, especially regarding right arm movements and movements of the lower body which were more pronounced in ADHD patients. Additionally, ADHD patients showed faster leg movements. Movement speed was more irregular with respect to the right arm and the lower body as compared to controls. In addition, results verify that the Kinect system can be used to collect movement data of most body parts. The study could indicate specific movement patterns in ADHD patient. In the long run, results will help to develop diagnostic tools differentiating ADHD patients from healthy con-

trols. Furthermore, results indicate that the Kinect full body tracking system is useful for the assessment of specific characteristics of hyperactivity.

Grab-O-Spider: Modulation of Phobic Reactions by Visibility of the Own Hand in Virtual Reality

Henrik M. Peperkorn[a,1], Georg W. Alpers[b] and Andreas Mühlberger[a]

[a]Department of Psychology, University of Würzburg, Würzburg, Germany
[b]Chair of Clinical and Biological Psychology, School of Social Sciences, University of Mannheim, Germany and Otto-Selz-Institute, Germany

[1]*Corresponding author*:
Henrik M. Peperkorn
peperkorn@psychologie.uni-wuerzburg.de

Abstract

Virtual reality (VR) is a capable means to activate fear networks in phobic patients. Visual representations of one's own body (e.g., hand) in VR enhances VR's immersive effect by elevation of experienced presence. The influence of body representation on phobic fear reactions is still unknown.

We analyzed the influence of a virtual hand on experienced presence and fear responses in 27 spider phobic patients. Patients sat in front of a table with an acrylic glass container within reaching distance. The same situation was modeled in VR. Fear responses were triggered either by phobia relevant visual input in VR (virtual spider in a visible virtual container) or by phobia relevant information of the laboratory setup (living spider in an unseen container). Patients were instructed to touch the container with their hand for 20 consecutive trials. Visibility of the hand-representation was varied randomly.

Presence in virtual reality is elevated by visibility of the own hand. The influence of this visibility on fear depends on the presence of fear triggers: When a virtual spider triggers fear perceptually, fear is higher than when a representation of the hand is visible. When fear is triggered by information about a real spider, it is higher when no virtual representation of the hand is visible.

Immersive effects of VR and fear of spiders are increased by a representation of the own body. Interestingly, fear towards unseen but present danger is reduced under these conditions. Results hint at a causal influence of presence on fear in VR.

Friendly ATTAC: Personalized and Adaptive Virtual Experience Scenarios to Combat Cyberbullying

Heidi Vandebosch[a], Karolien Poels[a,1], Katrien Van Cleemput[a], Sara Bastiaensens[a], Ilse De Bourdeaudhuij[b], Ann Desmet[b], Olga De Troyer[c], Edgar Omar Cebolledo Gutierrez[c], Frederik Van Broekchoven[c] and Koen Samyn[d]

[a]University of Antwerp, Belgium
[b]Ghent University, Belgium
[c]Vrije University Brussels, Belgium
[d]University College West Flanders, Belgium

[1]*Corresponding author*:
Karolien Poels
karolien.poels@ua.ac.be

Abstract

Cyberbullying is a relatively recent phenomenon. Especially among early adolescents the prevalence rates are high. Cyberbullying also has a serious impact on the mental health of victims. Because of these reasons, it is necessary to develop effective, evidence-based interventions. The typical characteristics of ICT (i.e. anonymity, large scale, promoting disinhibition, widespread among youngsters, high-level of involvement, possibility of personalisation, 24/7 availability, combining entertainment, information and socializing functions) have the potential to be particularly promising for tackling cyberbullying. An interdisciplinary team of Belgian researchers has recently initiated the "Friendly ATTAC" (Adaptive Technological Tools Against Cyberbullying) project. In this project an innovative ICT-tool is being developed to help youngsters deal with cyberbullying issues. The aim of the project is to modify relevant determinants of behaviours related to the roles of bullies, bystanders and victims by means of highly personalized, game-like virtual experience scenarios, providing players with immediate feedback in a safe computer-mediated environment. Examples are: increasing empathy in bullies and bystanders, enhancing social skills and teaching/training relevant coping strategies for victims. The adaptive, single-user scenarios utilize actual personal information that young people make available via social media (e.g. profile pictures). In this way Friendly ATTAC reproduces and integrates the social reality in which young people live into an evidence-based intervention tool.

Efficacy of an Internet-based Weight Loss Program – A proof-of-principle Trial

Elisa Postrach[a,1], Rosa Aspalter[b], Ulf Elbelt[a,c], Michael Koller[d], Jörg-Dieter Schulzke[a] and Luzia Valentini[a]

[a]The Division of Nutritional Medicine of the Department of Gastroenterology, Infectiology und Rheumatology, Charité-Universitätsmedizin Berlin, Charitéplatz 1, 10117 Berlin
[b]KiloCoach™, Theobaldgasse 7/10, A-1060 Wien
[c]Department of Endocrinology Metabolic Diseases, Charité-Universitätsmedizin Berlin, Charitéplatz 1, 10117 Berlin
[d]Centre for Clinical Studies, University Hospital Regensburg, 93042 Regensburg

[1]*Corresponding author*:
Elisa Postrach
elisa.postrach@charite.de

Abstract

As the prevalence of overweight and obesity increases globally, researchers interests' on easily accessible weight-loss technologies, such as web-based programs, is amplified. A commercially available internet-based program in German language is KiloCoach™. It enables users to understand and change their eating behaviour by analysing their dietary records. This study investigated whether KiloCoach™ induces an effective weight loss. Methods: 33 subjects (BMI 27-38 kg/m2, 30-65 years) were included and used KiloCoach™ at least 4 days per week. 10 subjects withdrew within the first 3 months of intervention. 23 subjects (m14/f9, 93.8±10.8kg, BMI 30.9±2.3 kg/m2, 46±11 years) completed study visits at baseline after 1 and 3 months. Here; anthropometric data, body composition (BIA), blood pressure, plasma lipid concentrations, quality of life (Obesity and Weight-Loss Quality-of-Life Instrument) and weight related symptoms (Weight Related Symptom Measure) were assessed. Results: Subjects recorded their dietary intake on a mean of 6.6 days per week after 3 months, where mean weight loss was 5.1±3.4 kg ($p<0.001$), corresponding with a reduction of 5.4±3.5 % of initial weight. The decreases in systolic blood pressure (143±19 vs.129±14 mmHg, $p<0.001$), diastolic blood pressure (94±11 vs. 87±10 mmHg, $p<0.001$) and plasma concentration of triacylglycerides (151±101 vs. 111±42 mg/dl, $p<0.05$) were significant. Waist-to-hip ratio ($p<0.005$), body cell-, and body fat mass ($p<0.001$) decreased significantly. QoL increased (OWLQOL, $p<0.001$) whereas weight related symptoms decreased (WRSM, $p<0.001$). Conclusion: The web-based program KiloCoach™ induced an effective weight reduction and decreased cardiovascular risk factors. Therefore, it seems an appropriate option to improve health in broad public.

Adaptive Aid Selection for Assisting People with Dementia

Andreas Pusch[a,1], Anja B. Naumann[b] and Jörn Hurtienne[a]

[a]Institute of Human-Computer-Media at JMU Würzburg, Germany
[b]Telekom Innovation Laboratories, Technische Universität Berlin, Germany

[1]*Corresponding author*:
Andreas Pusch
andreas.pusch@uni-wuerzburg.de

Abstract

By introducing an intelligent approach to adaptive aid selection which integrates both patients' needs and assistive functional requirements, we take current achievements in developing technological aids for people with dementia one step further. Based on previous empirical findings, we line out our concept of an architecture that offers adaptive support and guidance facilities to patients who suffer from a gradual loss of perceptual, cognitive, and motor abilities.

Neurofeedback System based on the Wireless ENOBIO for Virtual Reality Applications

Alejandro Riera[a,1], Antón Albajes-Eizagirre[a], Erwan Motte[a], Chris Ray[a,b], Aureli Soria-Frisch[a], Stephen Dunne[a] and Giulio Ruffini[a]

[a]Starlab Barcelona SL, Spain
[b]Saint Mary's College of California, USA

[1]*Corresponding author*:
Alejandro Riera
alejandro.riera@starlab.es

Abstract

We present a neurofeedback application, where an ENOBIO EEG acquisition device has been integrated with the NeuroVR Software (SW). A focus on usability and unobtrusiveness has been taken into account. Therefore, the ENOBIO wearable and wireless sensor was chosen as an EEG amplifier, and only 3 EEG channels are used (Cz and any pair of symmetrical channels such as F7 and F8). The ENOBIO sensor records the data and sends it wirelessly to the processing module. Here, a high-pass filter is applied to remove the DC offsets and the possible drifts. An artefact corrector is then applied that cleans data from high-amplitude artefacts. At this stage, the processing module extracts several features, namely the alpha asymmetry of the symmetrical pair of channels, and the alpha/beta ratio for each single channel together with their alpha, beta, and gamma powers. Finally, these features are normalized into the 0-1 real-valued range sent to the VR SW. The normalization step is done automatically and does not need a calibration phase. This application allows the user to control any parameter from the VR

environment. In an exemplary demonstration to be shown at the conference we control the size and sound of a campfire. With some training, the user can learn how to relax or excite him/her-self just by receiving visual feedback from the VR environment by controlling his/her brainwaves. The application of this technique is very much suited for many cognitive therapies such as neurorehabilitation and stress monitoring/management.

NeuroVR 2.1 - A Better Free Virtual Reality Platform for CyberPsychology and CyberTherapy

Giuseppe Riva[a,b], Andrea Gaggioli[a,b], Pietro Cipresso[a], Simona Raspelli[a], Federica Pallavicini[a], Silvia Serino[a,b], Cinzia Vigna[a], Andrea Gagliati[c], Stefano Gasco[c] and Giuseppe Donvito[c]

[a]Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano, Milan, Italy
[b]Psychology Department, Catholic University of Milan, Italy
[c]Virtual Reality & Multimedia Park, Turin, Italy

[1]*Corresponding author*:
Giuseppe Riva
giuseppe.riva@unicatt.it

Abstract

The potential of Virtual Reality (VR) for cybertherapy and cyberpsychology is high. However, it is not easy for a Ph.D student and/or a clinician to personally evaluate and exploit this potential (a critical issue is the high cost required to develop or to buy a virtual environment). To overcome this issue we developed in 2007 a NeuroVR free virtual reality platform that allows non-expert users to adapt the content of different predesigned virtual environments to the specific needs of the clinical or experimental setting. Following the feedbacks of the 2000 users who downloaded the first two versions, we developed a new version – NeuroVR 2.1 (http://www.neurovr.org) – that improves the possibility of customization for the user. The new features include advanced action triggering, realistic walk-style motion, advanced lighting techniques for enhanced image quality, and streaming of videos using alpha channel for transparency.

Clinical Application of Biofeedback and Neurofeedback in Psychiatric Setting

Dragica Kozarić- Kovačić[a,1] and Andrea Jambrošić-Sakoman[a]

[a]Referral Centre for Stress Related Disorders of the Ministry of Health and Social Welfare of the Republic of Croatia, Department of Psychiatry, University Hospital, Dubrava, Zagreb, Croatia

[1]*Corresponding author*:
Dragica Kozarić- Kovačić
dkozaric_kovacic@yahoo.com

Abstract

Applied psychophysiology, biofeedback and neurofeedback, have been used in treating various psychiatric disorders. Psychopsyhsiological parameters, such as electrodermal feedback, heart rate variability, peripheral temperature feedback, respiration or electromyografic feedback are used for the information on anxiety, arousal, or pain. Effectiveness of BFB and NFB has been shown for various disorders. Different parameters should be taken into account in the efficacy studies, since those studies are missing.

Internet Addiction in Cyprus – a Pilot Study

Konstantinos Siomos[a,1], Georgios Floros[a,b], Despo Loizou[c,d], Michalis Koutsoulis[c] and Vaios Dafoulis[a]

[a]Hellenic Association for the Study of Internet Addiction Disorder, Larissa, Greece
[b]2nd Department of Psychiatry, Aristotle University of Thessaloniki, Greece
[c]High School Educator, Cyprus
[d]Head of 'European School Network Health Promotion Program' in Latsia, Cyprus
[e]Specialized Outpatient Unit for Internet and PC Addiction, Department of Child and Adolescent Psychiatry, 'Hippokration' General Hospital of Thessaloniki, Greece

[1]*Corresponding author*:
Konstantinos Siomos
gfloros@hasiad.gr

Abstract

In this paper we present the results of a pilot study designed to ascertain Internet and personal computer (PC) addiction in the island of Cyprus. Research population included the entire adolescent (aged 12-18) high-school population of a Cypriot municipality, Latsia. Total sample was 884 students, 378 of whom were boys (42.8%) and 506 girls (57.2%). Mean age was 14.52 years (SE = .057). Research material included: extended demographics, Internet activities questionnaire, the Young Diagnosic Questionnaire (YDQ) and Adolescent Computer Addiction Test (ACAT) questionnaires. This study was the pilot step of a larger project to determine the extent of Internet and PC addiction in Cyprus. However, data gathering for the second phase is currently under way. Results indicated that the Cypriot population had comparable addiction statistics with other

Greek-speaking populations in Greece; 15.3% of the students were classified as Internet addicted by their YDQ scores and 16.3% as PC addicted by their ACAT scores. Those results are among the highest in Europe. Our results were alarming and have led to the creation of an Internet and PC addiction prevention program that will focus on high-school professor training and the creation of appropriate prevention material for all high schools, starting immediately after the conclusion of the pan-Cypriot survey. It will focus especially on those areas where the frequency of addictive behaviors will be highest.

Creating a Multidimensional Scale for Offline and Online Peer Victimization

Sindy R. Sumter[a,1], Susanne E. Baumgartner[a], Patti M. Valkenburg[a], Jochen Peter[a] and Simone van der Hof [b]

[a]University of Amsterdam
[b]Leiden University

[1]*Corresponding author*:
Sindy R. Sumter
s.r.sumter@uva.nl

Abstract

Peer victimization experiences can be detrimental to youth's well being. As youth increasingly use the internet to interact with each other, peer victimization also takes place on the internet. The detrimental effects of peer victimization, whether it takes place on the internet or offline, make it important to clearly define what is meant by peer victimization in both contexts, and how it can be measured. At the moment few balanced scales are available that can measure online and offline peer victimization. To fill this gap in the literature we developed the Multidimensional Offline and Online Victimization (MOOV) scale and tested its psychometric properties among 10 to 17 year olds (N = 401). The current study provided preliminary evidence that the MOOV is a valid and reliable instrument. The 16 item MOOV is a relatively short measure which increases its utility. The balance between offline and online items and the distinction between direct and indirect forms of peer victimization make this a promising measurement for future studies on online and offline peer victimization.

Interactive Virtual Audience Design for Fear of Public Speaking Training and Treatment

Ana-Despina Tudor[a,1], Sandra Poeschl[a] and Nicola Doering[a]

[a]Ilmenau University of Technology
[1]*Corresponding author*:
Ana-Despina Tudor
ana-despina.tudor@tu-ilmenau.de

Abstract

Several applications in immersive virtual environments, such as military training or psychological disorders training and treatment bring users face to face with virtual humans (VHs). In order to fulfill their roles as naturally and believably as possible, VHs should be endowed with verbal and nonverbal expressive capabilities. These capabilities include emotion displays through nonverbal cues such as facial expressions, gestures, body postures, and gait. Up to the current point there is a significant lack of theoretical basis to support the choice among different behavior designs when it comes to representing affect. The presented paper introduces a theoretical model of interaction that sustains the choice of certain design elements over others in relation to the representation of affect for VHs. The model is based on and integrates several theories on emotions and aims at reconciling the psychological aspects of emotion elicitation and display with the dynamic design requirements of VHs. The model serves as framework for design guidelines for VHs and proposes a map for one-to-one and one-to-many interactions between users and VHs. Applications of the model include development and improvement of system architectures for affective artificial intelligence and development of emotional virtual audiences used in fear of public speaking training and treatment. Specifically regarding the applications that involve virtual audiences, the model offers a basis for design, by taking into account the sociological aspects of group dynamics, such as audience reactions, polarization and diffusion of reactions during speeches held by users.

Advanced Media Technologies for Stroke Rehabilitation

Emmanouela Vogiatzaki[a,1], Peter Langendoerfer[b] and Steffen Ortmann[b]

[a]RFSAT Ltd, United Kingdom
[b]IHP GmbH, GERMANY

[1]*Corresponding author*:
Emmanouela Vogiatzaki
emmanouela@rfsat.com

Abstract

Stroke is a disease with very high socio-economic impact. In average the healthcare expenditure cost for Strokes across different countries in Europe and USA is 3% of their entire healthcare expenditure. This includes inpatient treatment cost, outpatient hospital visits and long-term rehabilitation and care. Analysis showed that costs of long-term care have increased from 13% to 49% of overall costs in average in recent years. Therefore there is an urgent need for devising an effective long-

term care and rehabilitation strategy for Stroke patients, which will involve the patients actively in the process while minimizing costly human intervention. The paper aims to present the early results of the Stroke Back project funded by the FP7-ICT program, which concentrates on the development of an integrated and automated remote rehabilitation system by blending advances of ICT and practical clinical knowledge that will empower the patients and their immediate care for effective application of the rehabilitation protocol in home settings. The system combines remote health condition monitoring with game-like rehabilitation training geared to be performed with the support of non-professional help of family members with remote supervision by leading physicians. The increased rehabilitation speed as well as the fact that the rehabilitation training can be done at home directly improves quality of life of patients. To sum up StrokeBack systems aims to increase rehabilitation speed while reducing the cost.

Toward the PTSD Ontology

Maryan Zirkle[a,b,1] and Bryan Travis Gamble[b]

[a]Oregon Health Sciences University, Portland, Oregon, USA
[b]Portland Veterans Affairs Medical Center,
Portland, Oregon, USA

[1]*Corresponding author*:
Maryan Zirkle
maryan.zirkle@va.gov

Abstract

Posttraumatic Stress Disorder constitutes a substantial proportion of the burden of illness among veterans. Given the heterogeneous nature of the disorder, there is a need for a better understanding of this domain. To have a universal understanding of disease, a formal explicit description of concepts in that domain of knowledge is necessary. No ontology exists to capture this knowledge specific to PTSD. In order to understand PTSD symptoms, treatments, and relationships between these two concepts, we draw on several styles of information acquisition: focus groups, cognitive interviews, clinical guidelines, SNOMED-CT, text mining, annotations, and natural language processing. We have gathered unique terms from several of these resources thus far: 43 terms from focus groups, 158 terms from guidelines, 172 terms from SNOMED-CT, 20 terms from text mining, 985 terms from annotations. Each concept in our ontology will be clearly defined and uniquely identified to capture the distinct, direct and indirect relationships among these PTSD concepts. A great deal of knowledge about the types of language used and the semantic web surrounding PTSD will come to light. This ontology will help to reuse domain knowledge, make domain assumptions explicit, and analyze domain knowledge via information extraction methods.

Clinician Perception of the Use of Computer-aided Psychotherapy to Treat Mental Health Disorders in U.S. Veterans

Maryan Zirkle[a,b,1]

[a]Oregon Health Sciences University, Portland, Oregon, USA
[b]Portland Veterans Affairs Medical Center,
Portland, Oregon, USA

[1]*Corresponding author*:
Maryan Zirkle
maryan.zirkle@va.gov

Abstract

Many individuals suffering from mental health disorders fail to get treatment. Reasons for this include: lack of time, lack of transportation, the stigma surrounding mental health issues, and lack of properly trained practitioners. One way to alleviate these barriers is to provide a computer-aided form of support and treatment. Computer-aided psychotherapy (CAP) systems have been found to be efficacious in the treatment of several mental health disorders, such as: depression, anxiety, and phobias. Currently, the use of these systems is primarily found outside of the United States. The purpose of this study is to determine clinicians' perceptions about implementing CAP systems here in the United States. Specifically, I intend to explore the advantages and disadvantages to implementation in current mental health treatment plans. Knowledge about what mental health clinicians find beneficial and unfavorable during treatment with psychotherapy via computer-aided techniques can help to create, optimize, and implement these systems successfully in the United States. Several studies throughout the United Kingdom, Australia, and New Zealand have reported the effectiveness of these systems, as well as the controversies of these systems. This study will collect data from focus groups, cognitive interviews, and a survey in an attempt to understand opinions about CAP. Ten Veterans Health Administration mental health clinicians from Portland Veterans Affairs Medical Center and 10 mental health clinicians from James A. Haley Veterans Affairs Medical Center will participate. Results may provide a foundation for the creation of a computer-aided psychotherapy system to be used among veterans with mental health disorders.

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Editors: B.K. Wiederhold and G. Riva

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Virtual Healers
Brenda K. Wiederhold, Ph.D., MBA, BCIA

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Virtual Reality in the Mental Health arena is barely over a decade old. Because VR is still such a young and focused field, the members of its community have come together as a tight-knit family. In Virtual Healers, Dr. Brenda K. Wiederhold, herself a pioneer of VR, sits down in casual one-on-one interviews with more than a dozen of the top researchers of this select group.

Virtual Healing
Brenda K. Wiederhold, Ph.D., MBA, BCIA

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Along with aliens and time travel, virtual reality (VR) is often thought of as a science fiction dream. Though it was developed nearly five decades ago, the use of VR in the private sector, particularly in the field of patient care, has become a possibility only in the past decade. As programmers are creating more detailed and interactive environments, the rapid advancement of technology combined with decreasing costs has turned VR into a promising alternative to traditional therapies.

Virtual Reality Resources
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We, at the Interactive Media Institute, realized early on that it was relatively difficult for professionals wanting to break into the Virtual Reality (VR) field to locate relevant information. While the material was out there, there was no clear organizational structure or database to link it. To solve this problem, we have put together Virtual Reality Resources, a relevant compilation for researchers and clinicians alike.

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By Brenda K. Wiederhold, PhD, MBA, BCIA

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A decade ago, CyberTherapy, then still in its infancy, only existed as a specialized Virtual Reality and Behavioral Healthcare Symposium at the Medicine Meets Virtual Reality (MMVR) Conference. It is now clear that in 1996, we had only begun to realize what promise might lie ahead for both VR technology and the CyberTherapy Conference.

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Conquering Panic, Anxiety, & Phobias

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This book is written as a starting point toward helping the large portion of our population that suffers from anxiety disorders to overcome their fears and control their anxiety. It is a resource to enable those suffering from anxiety to take control of their lives and become an active participant in their own recovery.

This book is essentially divided into two parts: a discussion of anxiety and its physical and emotional effects on sufferers. While Virtual Reality Therapy is described, its use is not necessary in order to follow the suggestions in this book. The lessons and worksheets included can help in a variety of areas, not just anxiety, but anger, mild depression, and feelings of helplessness.

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CYBERPROJECTS

IN THIS FEATURE, we will try to describe the characteristics of current cyberpsychology and rehabilitation research. In particular, CyberProjects aims to describe the leading research groups and projects, actually running around the world, with a special focus on European research.

NeuroVirtual 3D: Design, Development and Assessment of a Multiplatform 3D Simulation System for Application in Psychology and Neurorehabilitation

Recently, many studies have been conducted to demonstrate the efficacy of using Virtual Reality (RV) in a clinical setting, and in particular in psychotherapy, neuropsychology and neurorehabilitation. This approach is based on the use of a technology that allow researchers to simulate daily life experiences through 3D interactive environments generated by the computer. By combining the simulation of 3D environments with audio tactile devices and immersive display like virtual head mounted display it's possible to induce in the user the feeling of interacting in a real environment and so, to create situations and exercises which could help the therapeutic action, within the safe context of the therapist's laboratory. Moreover, the use of sensors of movements (such as the head-tracker) allows recording user's behaviors and to use these information to improve assessment and treatment decisions.

Thanks to these features, VR is becoming a tool more and more employed in the neuropsychological and neurorehabilitation fields. Within these contexts, a fundamental aim is to foster quantitative and qualitative improvements in daily-life activities in order to promote an independent lifestyle.

A fundamental feature of VR to support this process is interaction: thanks to this feature, it is possible to lead patient to interact within the simulated environment and manipulate the objects inside through the use of haptic devices and input peripherals such as the data-glove and the head-tracker. The "controlled immersion" in the virtual environment allows the patient to perform exercises specifically planned for this kind of approach (for example, to catch a virtual ball moving) and to learn again abilities compromised by neurological damages.

Thanks to these features, VR make possible to satisfy the main principles of an effective rehabilitative process, like the repeated practice, the feedback on the performance and the motivation to support patient's compliance with the prescription of the therapeutic protocol.

On the other side, VR leads the therapist to constantly monitor patient's performance and to quantify his/her improvements (or relapses) giving an objective evaluation of his/her state in time. Another important advantage regards the benefits of the experience of "presence", that is the perception of the simulation as it is a real experience. Many studies suggest that virtual reality is, among the interactive media, the most able one to increase the sense of presence and so to transfer abilities and competencies got within the simulated environment in the real one. These features reflect in the results of the studies on the assessment of the efficacy of virtual reality as a neurorehabilitation technology. Specifically, VR is a tool potentially very useful to rehabilitate daily life activities which require specific executive and motor functions.

MAIN ISSUES AND AIMS

If, on the one side, the use of VR in rehabilitation represents a consolidated and rising scientific trend, the use of this tool in clinical practice is very limited, especially at European level. According to recent reports, in Europe VR is employed especially within clinical research projects while its professional use is extremely limited. This data cannot be explained by the immaturity of technological components, that have developed thank to the huge development of the videogames market, and through the lack of scientific evidence about the efficacy of this approach.

A more suitable explanation of the absence of diffusion of VR in the rehabilitative field is related to two specific problems: a) the lack of easily usable, low cost and high reliability tools; b) the little availability of rehabilitative contents, that are interactive simulations aimed at practice and therapeutic stimuli. Another problem is represented by the absence of integrated solutions between research and clinic: often therapists are interested not only in taking care of the patient through the use of VR but also in collecting important data for the improvement of the efficacy of the therapeutic solutions.

Finally, the need to assess the so called "transfer of training" (that is to establish to which extent the results obtained through the virtual reality exposure can be transferred to daily life activities) should not be overlooked. In this perspective, an emerging need is to effectively use the possibilities offered by the new mobile technologies (smartphone, wearable sensors) to permit the patient to carry on exercises also at home and to give to the therapist important indications related to the level of compliance with the therapeutic instructions.

Starting from these premises, the NeuroVirtual 3D project aims at addressing these challenges by designing, developing and testing a low-cost integrated virtual reality solution for applications in clinical psychology and neuromotor rehabilitation.

INNOVATIONS ACHIEVED IN THE PROJECT

The main goal of the NeuroVirtual 3D project is to design and develop a low-cost VR platform for applications in the fields of mental wellbeing and neuromotor rehabilitation. The spe-

cific technical innovations provided by the project are:

1. interfaces development for input/output hardware devices for applications in neurorehabilitation (e.g., dataglove, haptic devices, Kinect);

2. integration with eye-tracking devices;

3. development of multi-user interaction and communication through avatars;

4. development of players for the fruition of 3D contents on mobile devices (Android, iPhone, iPad, ...);

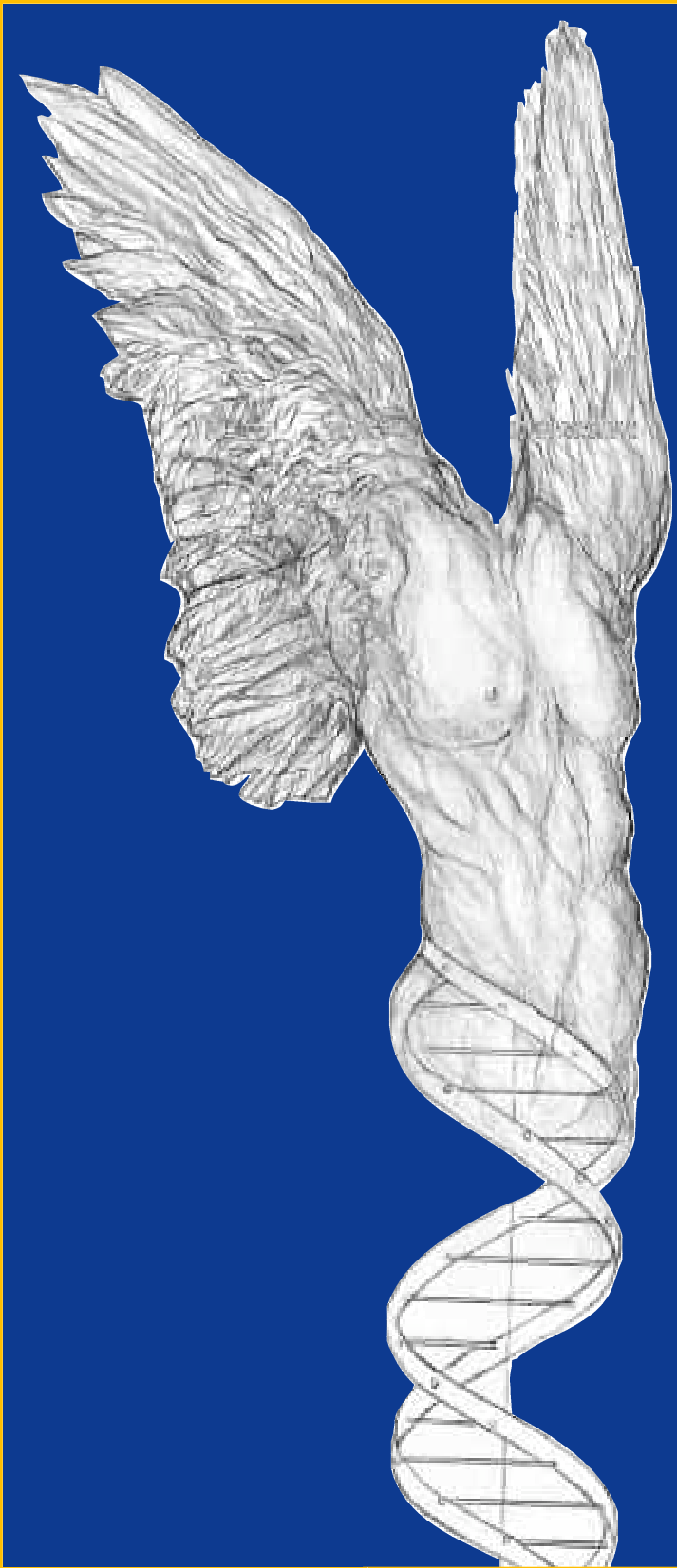
5. development of an online repository of 3D scenes for the sharing of the environments among the software users.

The expected results for this kind of project are several. As know-how, the research on new rehabilitative therapies in the psychiatric field different from the traditional psychological ones are fundamental. Their integration with the use of immersive virtual reality is now well established thanks to the great therapeutic potential of this technology. In this field of research, know-how is certainly not comprehensive because many study are still in progress and it could be surely increased by projects similar to ours that include the innovative design of rehabilitation protocols and their applicability through the use of immersive virtual reality.

Concerning technological impact, we believe that some features of our platform will have an impact in terms of innovation in this scientific sector. In particular, it is crucial the possibility of a therapeutic engine that allows to download different scenarios from an Internet repository to be customizable on the basis of the different therapeutic strategies and the different psychological approaches, and an effective interface to a well-advanced terminal that makes the experience truly immersive amplifying the therapeutic effect.

CONTACT INFORMATION
Dr. Pietro Cipresso, Ph.D.
Istituto Auxologico Italiano,
Via Ariosto, 13, Milan, Italy

Compiled by Pietro Cipresso, Ph.D.
and Silvia Serino, Ph.D. Candidate
Istituto Auxologico Italiano



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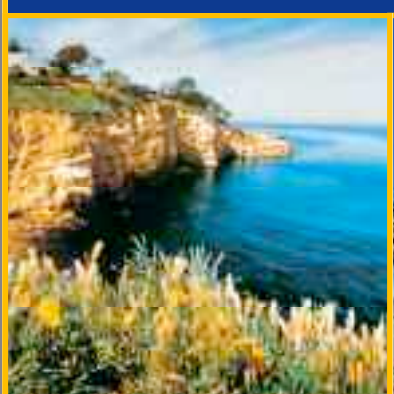
Next February's conference will feature a special half-day symposium, "VR for Therapy & Rehabilitation: Two Decades' Accomplishments and Future Directions," organized by Professors Brenda Wiederhold, Mark Wiederhold, and Giuseppe Riva.

The Call for Presentations is open through July 15, 2012. Researchers are invited to participate in NextMed / MMVR20 with papers, posters, and independent activities. Details at:

www.NextMed.com




CYBERFOCUS

New technologies are developing at a rapid pace. To help you stay abreast of the latest trends in advanced technologies and healthcare, this feature showcases upcoming 2012 events which will provide you with the opportunity to connect with leading experts worldwide and remain on the cutting edge of the most recent developments.

The CyberFocus column welcomes your contributions. To supply relevant information for this feature, please send an E-mail to: office@vrphobia.eu.

CyberPsychology & CyberTherapy[18]: Experience the Future of Health & Well-Being
TBD
Brussels, Belgium
www.interactivemediainstitute.com/CYBER17

The Journal of CyberTherapy & Rehabilitation is the official journal of the CyberPsychology & CyberTherapy Conference (CYBER[18]). CYBER[18] will bring together researchers, clinicians, funders and policymakers to share and discuss trends in healthcare and technology. CYBER[17] continues to seek input from a wider segment of the scientific community, and is interested in attracting experts in clinical therapy and rehabilitation, cognitive sciences, social sciences, and computer sciences dedicated to *shaping the future of health & well-being.*

Key focus areas will include:

1. The Impact of Technologies as Tools: technology's use in training, therapy, rehabilitation, and education to improve the quality and availability of healthcare.

2. The Influence of New Technologies: technology's influence on behavior and society (e.g., positive technology for well-being, healthy ageing, and inclusion).

3. The Imprint of Social Networking: the exploration of social networking tools on individual behavior and societal relations.

4. New Technologies/New Terms: studying the psychological aspects of new areas influenced by technology (e.g., cyberfashion, cyberadvertising, cyberstalking).

2012 Conferences

IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
November 5-8, 2012
www.ieee.org/conferences_events
Atlanta, Georgia, USA

2013 Conferences

International Meeting on Simulation in Healthcare 2013 Annual Meeting
January 26-29, 2013
http://ssih.org/welcome-to-imsh-2013
Orlando, Florida, USA

MMVR 2013: Medicine Meets Virtual Reality
February 20-23, 2013
http://nextmed.com/
San Diego, California, USA

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eTELEMED 2013: The Fifth International Conference on eHealth, Telemedicine, and Social Medicine
February 24-March 1, 2013
http://www.iaria.org/conferences2013/eTELEMED13.html
Nice, France

World Innovation Convention
November 28-30, 2013
http://www.winovc.com/index.html
Cannes, France

Med@Tel
April 10-12, 2013
Luxembourg
http://www.medetel.eu/index.php

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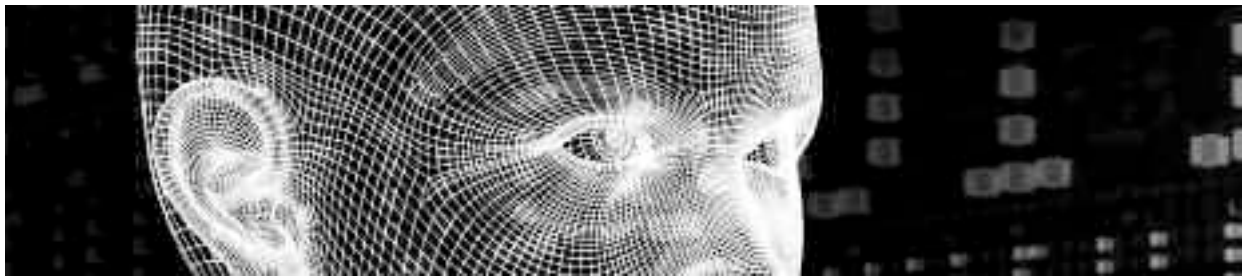
eHealth
May 13-15, 2013
Dublin, Ireland
http://worldofhealthit.org/2012/



FOR AUTHORS

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JCR accepts two types of papers
Full-length manuscripts – original work that should not exceed 35 pages double-spaced including references and all tables and figures. *Short reports* – original work that may include case studies and exploratory work; should not exceed 2,500 words including references and no more than two total tables and/or figures.

Format. The original manuscript should be double-spaced and formatted for A4 paper (.27 in x 11.69 in; 21 cm x 29.7 cm) with adequate and consistent margins on all pages.

The title page, abstract, references, appendixes, author note, content footnotes, tables, figure captions, and figures must be on separate pages (with only one table or figure per page.) They should be ordered in sequence, with the text pages between the abstract and the references.

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Publishing House
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30 Clos Chapelle aux Champs, Bte. 3030
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Telephone: +32 (0)2 880 62 26
Fax: +32 2 762 93 33
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Web site: www.vrphobia.eu

Interactive Media Institute
9565 Waples Street, Suite 200
San Diego, CA 92121, U.S.A.
Telephone: +1 858 642 0267
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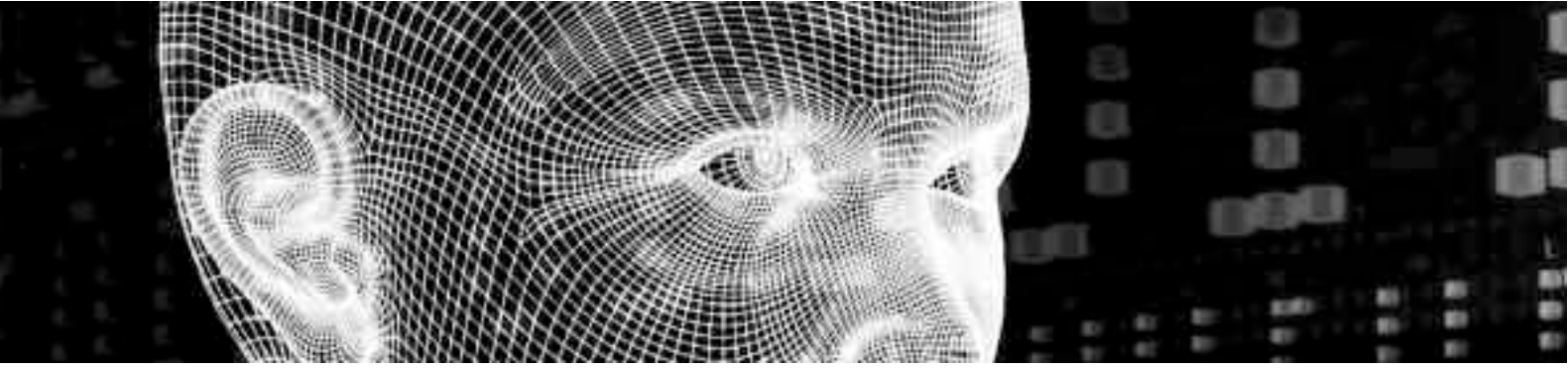

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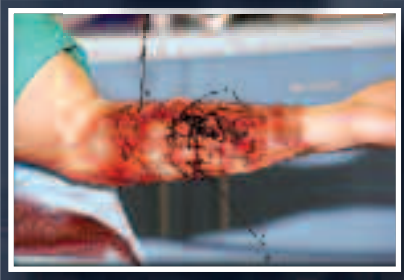

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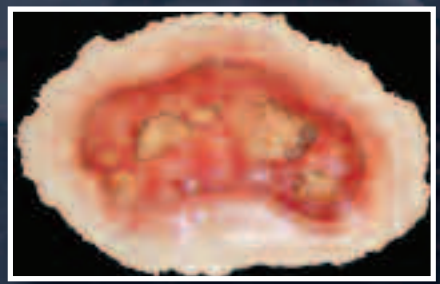

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