



WORKSHOP 1-AM : June 26th, 2018

Exploiting Artificial Intelligence through Virtual Reality and Vice Versa

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Educational Objectives and Abstract

Upon completion of this workshop, the participant will be able to:

1. Build Virtual Environments from the scratch, by using free software
2. Use the Virtual Reality to conduct experiments about human behavior
3. Collect data by using Virtual Reality and the body (BodyPass EU project)
4. Geometrical topology in VR and logging systems for event-data recording
5. AI and Psychophysiology: Nervous System, Endocrine System, and Gene Transcription
6. AI and Exhibited Behavior Patterns (also analyzed by using Microsoft Kinect and cameras)
7. Computational Science, Complex Networks, and Simulations
8. Toward an integrated platform of human behavior simulation: The Petribus model

Description:

Dr. Cipresso and Colleagues will guide the participants through the enchanted brand new world of emulation and simulation, with the aim to build a culture of human behavior simulation by using virtual reality. The pragmatic path has been thought to drive the participant to understand and build VR for AI and to use AI for VR experiment. The approach will be used to integrate data in virtual environments that can be effectively used for both clinical and research purposes. By fusing data from biosensors and devices interconnected within the VR environments, it is possible to

synchronize all these signals with the log of the VR events that the researcher has set to identify experimental conditions as well as unexpected occurrences, incidental findings and all of the behaviors one may wish to analyze. In this sense, VR can be considered a great way to collect quantitative data of people's actual behaviors during realistic situations in simulated environments. In any case, the use of new technologies and new methods can only be driven by a new class of psychologists and psychometricians who rely on the actual knowledge of psychological science as it is at the moment, but also can build new ways of thinking, such as AI-based, about psychological settings, experiments, studies, and, above all, interventions. These capabilities will provide a deeper understanding of human behavior through AI and computational techniques, and lead to improvements in the well-being of humankind.

Target Audience:

Researchers, non-math experts, non-psycho experts, curious explorer

Approach:

Formal lecture and practical demonstrations

Materials (open access - available for free ... to find them in google is the first step of the course !!):

Cipresso P, & Immekus, J. C. (2017). Back to the Future of Quantitative Psychology and Measurement: Psychometrics in the Twenty-First Century. *Frontiers in Psychology*, 8, 2099.

Cipresso P, Matic, A., Lopez, G., & Serino, S. (2017). Computational paradigms for mental health. *Computational and Mathematical Methods in Medicine*, 2017.

Cipresso P, Bessi, A., Colombo, D., Pedroli, E., & Riva, G. (2017). Computational psychometrics for modeling system dynamics during stressful disasters. *Frontiers in Psychology*, 8, 1401.

Cipresso P, Serino S, Riva G (2016), Psychometric assessment and behavioral experiments using a free Virtual Reality platform and computational science. *BMC Medical Informatics and Decision Making*, 16 (37). DOI: 10.1186/s12911-016-0276-5

Cipresso P, Riva G (2016). Computational psychometrics meets Hollywood: The complexity in emotional storytelling. *Frontiers in Psychology*, 7:1753. DOI: 10.3389/fpsyg.2016.01753

Cipresso P (2015). Modeling Behavior Dynamics using Computational Psychometrics within Virtual Worlds. *Frontiers in Psychology (Quantitative Psychology and Measurement)*, 6:1725. doi: 10.3389/fpsyg.2015.01725

Cipresso P, Matic, A., Giakoumis, D., & Ostrovsky, Y. (2015), Advances in computational psychometrics, *Computational and Mathematical Methods in Medicine*, Article ID 418683. DOI: 10.1155/2015/418683

Cipresso P, Serino S (2014), Virtual Reality: Technologies, Medical Applications and Challenges, *Nova Publishers*, ISBN: 978-1-63321-933-5