

Wearable system for automatic emotions detection in extreme conditions

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ATMN and CT05
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Introduction

- ❑ 1872: Darwin postulated that human beings were able to recognise the expressions instinctively, and they took their decisions based on the interpretations of the gestures

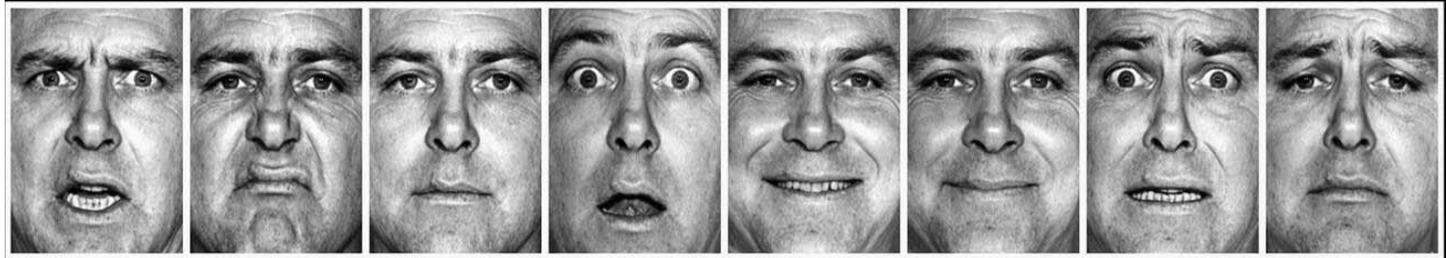
 - ❑ 1971: Ekman y Friesen
 - 6 primary emotions
 - ❑ Sadness, anger, fear, disgust, surprise, happiness and contempt
 - Basic and universal
 - Relationship between emotions and facial expressions
 - Method for classifying any emotion
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Introduction



Automatic recognition of facial expressions

- ❑ The classification of facial expression is a complex task:
 - Study of specific actions in different regions of the face



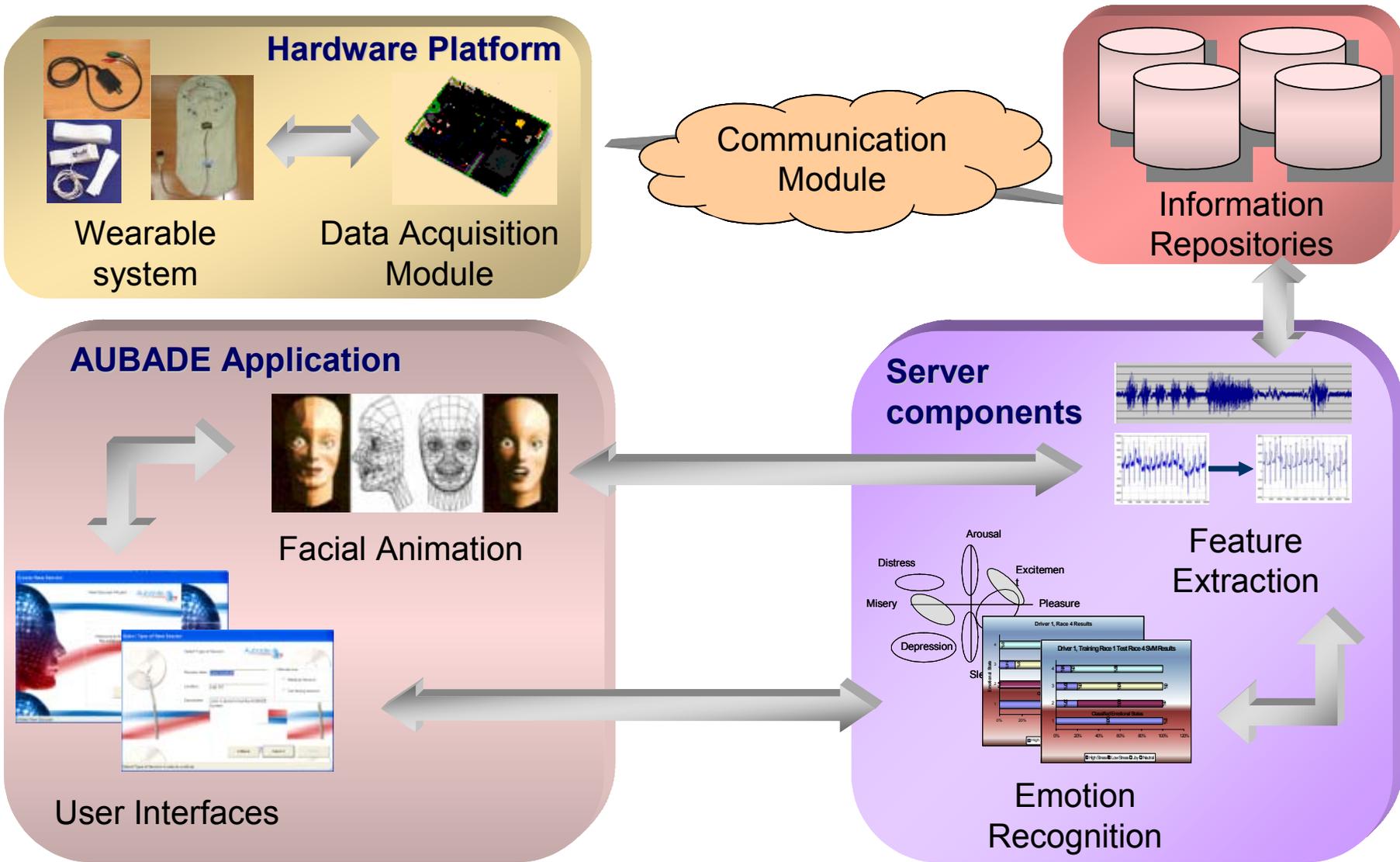
- Traditionally based in advanced image processing techniques
 - New methods under research
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AUBADE project

- ❑ The goal of AUBADE is to implement an intelligent, multisensorial **wearable system** that can ubiquitously monitor and classify the **emotional state** of people under extreme or special conditions

 - ❑ Study of new methods for emotions detection
 - ❑ Biomedical signals measurement
 - Electromyogram (EMG)
 - Additional signals:
 - ❑ ECG
 - ❑ Skin conductivity
 - ❑ Respiration rate
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The AUBADE system



Clinical Application

□ Parkinson's disease

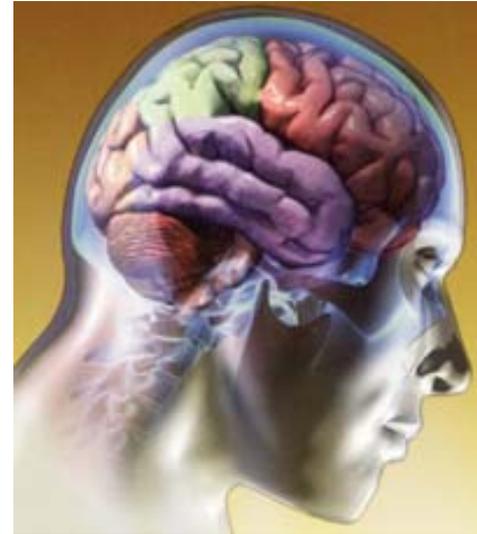
- Patients affected by Parkinson's disease lose their capability to express emotions and become inexpressive
- Assessment of patients' capability to express emotions

□ Epilepsy disease

- Deficits in the recognition of fear
- Assessment of patients' capability to express fear emotions

□ Huntington's disease

- Deficits in the recognition of anger and fear, and an especially severe problem with disgust
- Assessment of the ability to feel and express emotions by themselves



Racing Car Application

❑ Racing Car Pilots

- Users rarely express their emotions
- Mask and helmet for safety reasons
- Near-real time monitoring of the driver's emotions



Benefits and Results

□ Health care sector

- Improvements in the diagnosis of neurological disorders
- Better comprehension of patients psychological condition
- A tool for providing alternative treatment to patients
- Establishment of relationships between facial expressions and certain neurological diseases
- Improve knowledge in the area

□ Car racing companies

- Assessment of pilots' limits and the effects that the different working conditions, fatigue or stress produce on them
 - Prevention of accidents due to human failures
 - Increase driver's security
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Conclusions

- ❑ Human behaviour is driven not only by intelligence but also by emotions
 - ❑ The proposed system considers an alternative and innovative approach to the traditional emotion recognition techniques
 - ❑ Important benefits for the health community and application in other sectors
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