

# M. Courgeon, C. Jacquemin, J.-C. Martin Poster n°2008-37

## Virtual Humans: Expressivity, Interactivity and Realism

### Research Domain: **Virtual Humans**

- + Affective Computing (Expressive virtual agent)
- + Graphics (Realistic rendering and animation)

### Research Goals

- Model and design a platform for addressing **complex expression of affects + realism + real-time interactivity**
- Provide experimental results about the perception of realistic facial expressions during interaction
- Validate the platform via affective computing interaction applications

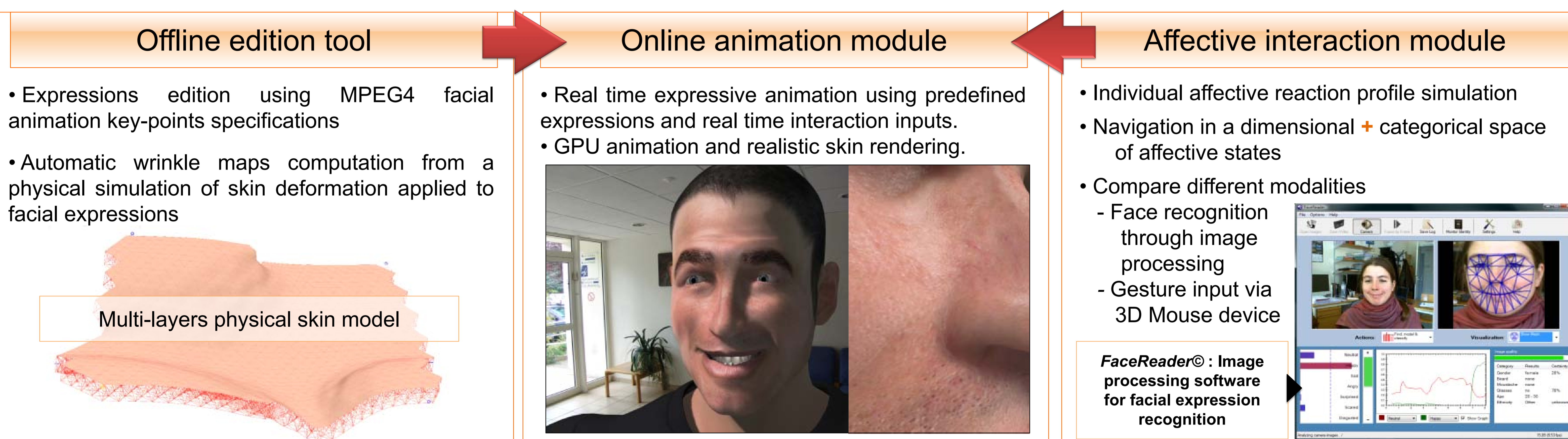
### Target applications

- Video-game, e-commerce, e-learning, critical control... Any application that requires emotional and affective engagement of the user

### Key Issues for Current Research on Virtual Agents

- **EXPRESSIVITY**  
Limitations on facial expressions of affective states, and individual differences
- **REALISM & EXPRESSIVITY**  
Subtle and realistic signs of affect are not fully exploited. (skin color, detailed wrinkles, skin texture, shadows, skin moisture...)
- **REAL-TIME INTERACTIVITY & REALISM**  
Most virtual agents are realistic (movies) OR interactive (games, web agents)
- **EXPERIMENTAL RESULTS**
  - Little is known about the impact of subtle and realistic signs of expressions on affective perception and interaction
  - Biomechanics is rarely evaluated for its contribution to the expressivity of an avatar

## MARC : a **M**ultimodal **A**ffective and **R**eactive **C**haracter



## APPLICATIONS

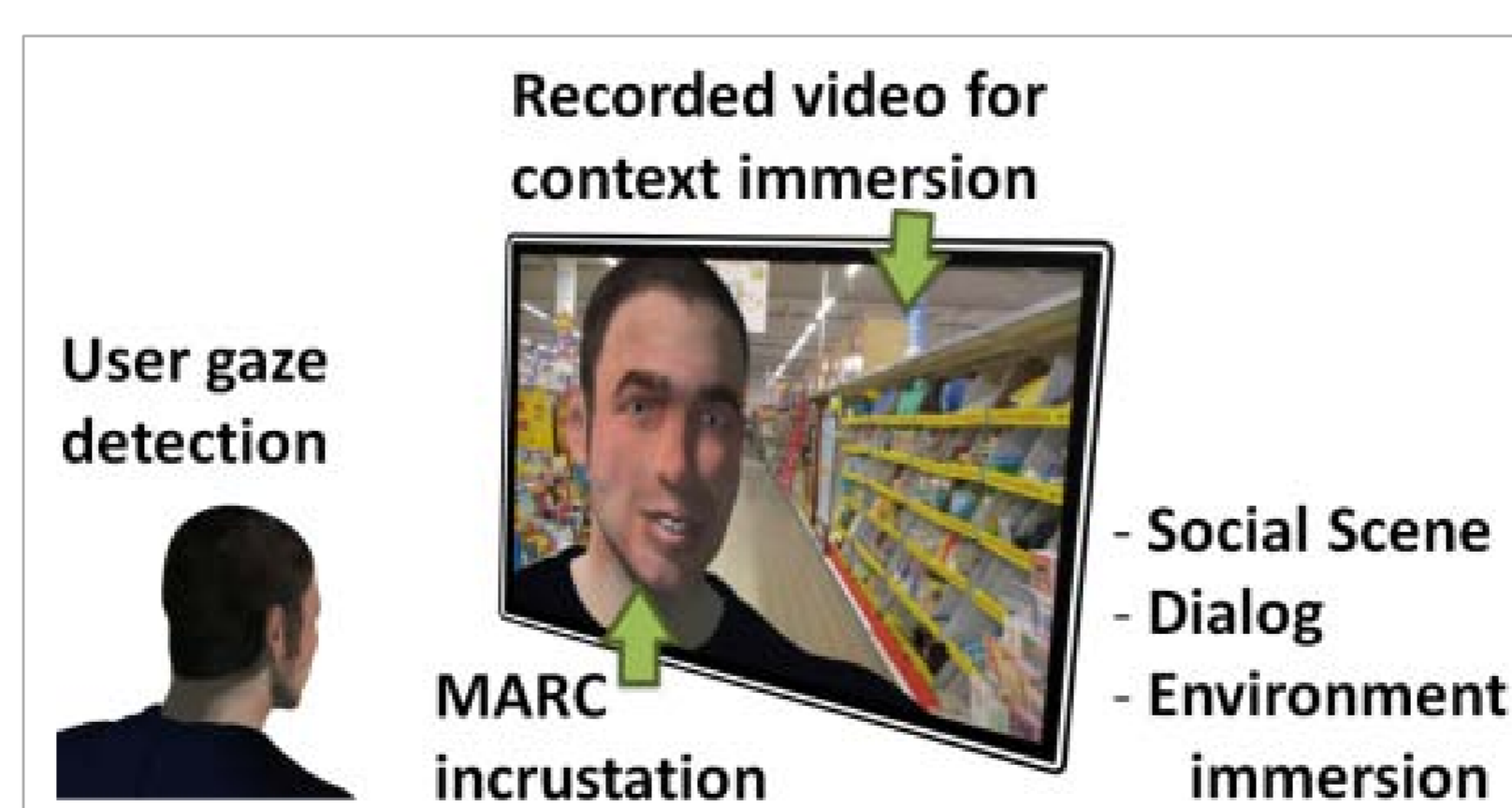
### CARE : Artistic ANR Project



Cultural experience: **Augmented Reality and Emotion**. MARC is used to enhance the audience's experience of augmented ballet performance.

Partners: **IMMERSION, ESTIA, IRIT, Univ. J. Fourier**

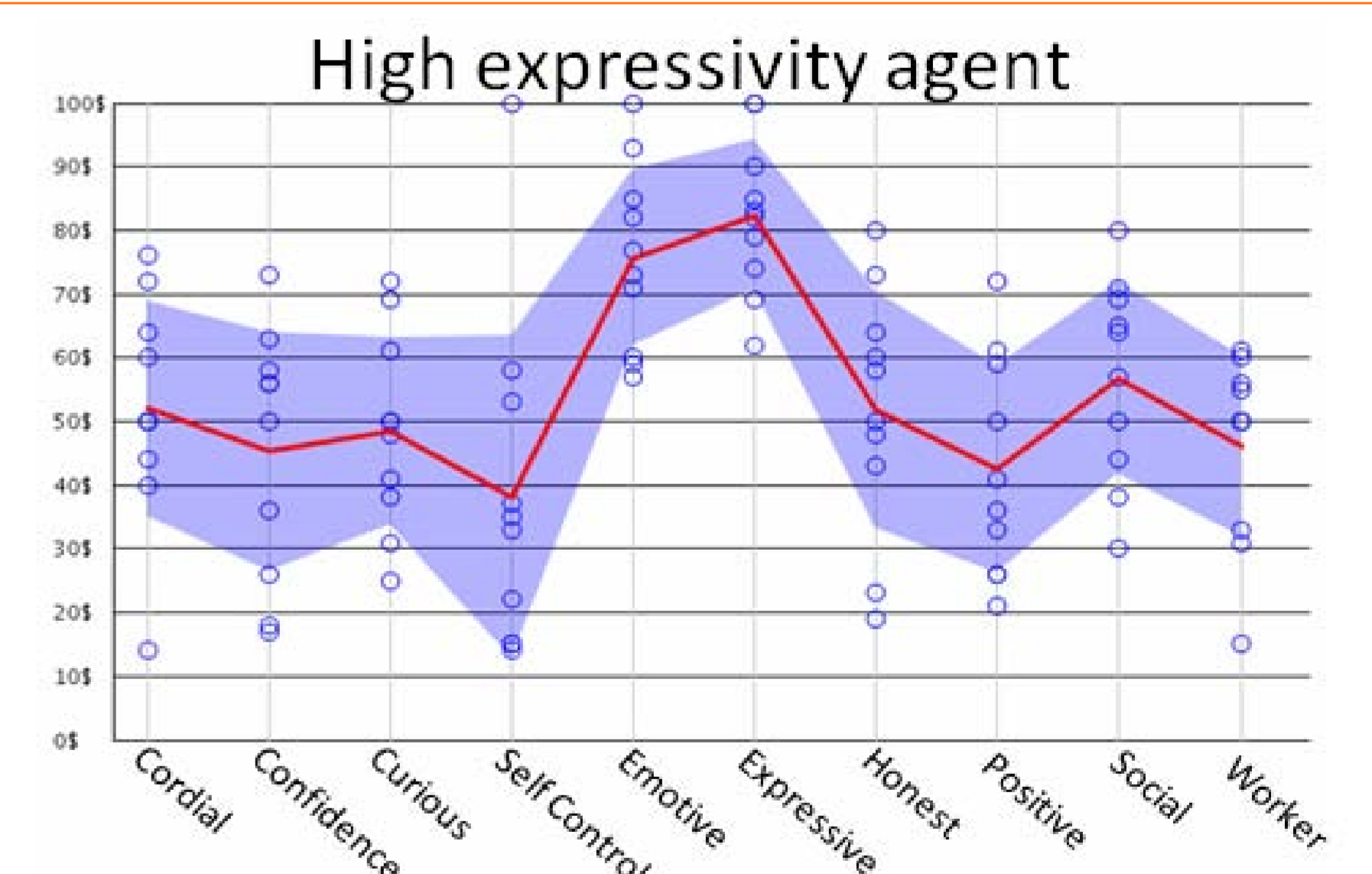
### AUTISM : *Fondation de France*



Virtual environment for social training. MARC is used along with gaze direction detection to perform perceptive test on autistic children.

Partners: **LORIA, Hôpital Charles Perrens (Chartres)**

### Perceptive evaluations



Study of user's perception of different agents specified with different individual affective reaction profiles

## Future directions

- Model:**
- Integration of multiple human face models (women/children)
  - Split animation between accurate off-line design and dynamic blend-shape animation

- Evaluate:**
- Perceptually efficient biomechanical modeling of skin and muscular control
  - Evaluations about user's perception of emotion using different parameters such as: Model's gender/age, model's realism, biomechanical model ...

## References

- Courgeon et al. *MARC: a Multimodal Affective and Reactive Character*, (2008) ICMI'08, AFFINE Workshop
- Courgeon et al. *User's Gestural Exploration Of Different Virtual Agents' Expressive Profiles*, (2008) AAMAS'08

Contacts : {COURGEON, JACQUEMIN, MARTIN}@LIMSI.FR