Proposition de Stage de Master recherche 2016

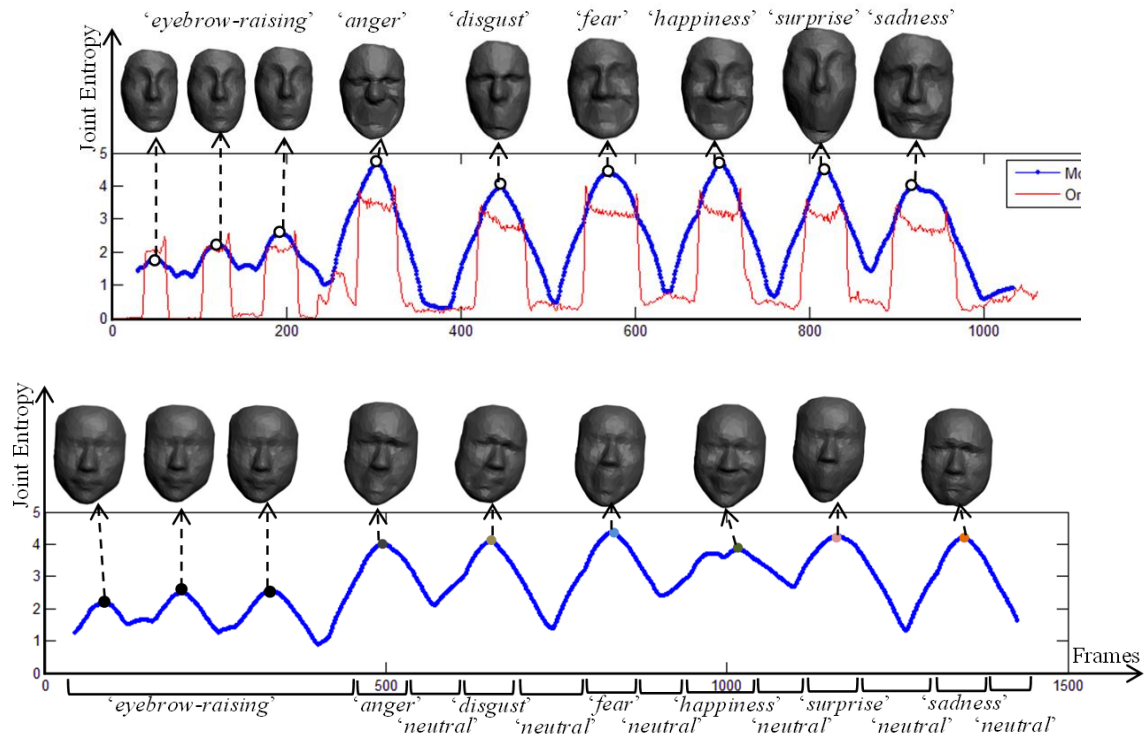# *Learning-Based Facial Animation*

Fig.1 : Facial animation sequences of two persons carrying identical emotions.[1]

Duration : 6 months

Workplace : Laboratoire ICube (CNRS / Université de Strasbourg)

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Prerequisite : - C/C++ Programming
- Basic notion in statistics, and interest for facial animation. Knowledge in neural network is a plus.

Keywords : facial animation, neural network, dimension reduction.

Subject :

Realistic facial animation has been a long sought research subject in computer graphics. While there has been a large body of work that learns from individual data [2][3][4], little has been done with the idea of using multiple sets of animation data. In particular, learning from a population data becomes nontrivial when it comes to animation data.

In this project, we will develop a learning based facial animation technique that makes use of a

population of 4D facial scan data with markers. Learning based methods that are appropriate for time-varying data (RNN[5], evolving RBF[6], etc.) will be adopted. This will require us to build a common representation space for the population of animation data. In doing it, we will prefer to avoid computing the temporal correspondence among them.

To sum up, specific objectives of this stage are:

1. Investigation of a compact mathematical representation of animation data. Linear or nonlinear models (PCA, Kernel PCA [7], LLE[8], isomap[9], etc.) will be considered, with a specific focus on the common representation space for a population data. Several types of distribution will also be considered, such as Gaussian or non- Gaussian distributions [10].

2. Development of a learning based facial animation system with neural network, with focus on modeling the relation between the facial morphology and the animation.

Bibliographie

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