PhD Thesis **Wenlu YANG**

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Title: Embedded architecture and physiological sensors

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Abstract: The originality of this thesis is the design of the most appropriate embedded architecture implementing dynamic learning techniques on physiological signals (EDA, EEG, ECG, EMG ...) to automatically recognize emotions. The objective is to obtain an architecture that reacts as closer as possible to a particular person. For this, the machine learning algorithm must automatically adapt to new physiological data it receives to implement automatic recognition of a mental state. The automatic adaptation of the learning algorithm to these changes is an emerging problem and challenges of the thesis are to design algorithms and architectures: embedded, effective execution speed and memory space; capable of integrating new descriptors, as well as new classes (new mental states); capable of detecting abrupt changes or breaks without confusing them with noise; able to follow developments and remaining robust and therefore knowing control oblivion. These challenges will be validated in several scenarios, such as video games, coaching, professional training and events.

Connection to the SENSE project:
The purpose of this thesis is to study emotions and learning in human interactions - virtual agent. It is to apply the concepts of extraction and characterization of social signals (WP2 SENSE project) and adaptation over time interaction (WP4) to determine the emotional impact of sequences successive one video game, a coaching session or training, a person, to fit the scenario of the game, or the sequencing of the coaching session or training accordingly.