PhD Position
IRISA lab, University of Rennes 1 at Lannion, Côtes d’Armor
Expression Team http://www-expression.irisa.fr/

Subject: multimodal detection of abnormality in discourse: using voice and facial expressions

Application: URGENT
Please send a CV and reference letters by e-mail to all the following contacts: Arnaud Delhay (arnaud.delhay@irisa.fr), Pierre-François Marteau (pierre-francois.marteau@irisa.fr) and Damien Lolive (damien.lolive@irisa.fr) BEFORE the 4th of May 2015.

The thesis will be co-funded by the DGA (French Defence ministry). The candidate must have the nationality of a country of the European Union or of Switzerland. S/he must hold a Master degree (or equivalent) in computer science.

The candidate is expected to conduct cutting-edge applied research in one or several of the following domains: signal processing, statistical machine learning, speech and gesture recognition. S/he should have excellent computer programming skills (e.g. C/C++, Python/Perl, etc.), and possibly knowledge in machine learning, signal processing or human computer interaction.

Duration: 3 years
Date: October 2015 – September 2018

This PhD, proposed by the EXPRESSION team at IRISA, will address the detection of abnormality from facial movements and speech signals of a human being in a situation of stress. We mean by ‘abnormality’ existence of foreign elements to a normal situation in a given context. The study will focus in particular on the joint use of facial and vocal expression parameters to detect abnormal variations of expressivity in speech, not only related to emotion, but also to social interactions and psychological signals. These abnormal signals can appear in extreme stress situations for pilots or vehicle drivers, for example. This study could also find applications in the medical field, e.g., detection of abnormal behaviors due to mental disabilities such as autism.

We aimed at developing a system capable of detecting abnormal behaviors by the analysis of records of concrete situations. The thesis will then explore several issues including the followings:

- Collect, segment and annotate multimodal data;
- Identification of descriptors enabling the description of abnormality;
- Development of dedicated machine learning approaches for abnormality detection;
- Development of a decision system.

Keywords: Speech, facial expressivity, gesture analysis, heterogeneous information, machine learning, classification
Bibliography:


