

Year 10 - Project Update

- ▶ **10a.002.TAU_WP4 - Computationally Efficient Graph-Embedded Subspace-Learning Methods (Dead Set Bit)**

Project Team

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Project Goals & Novelty of Approach

- ▶ The project aims at developing novel method(s) for obtaining a mapping along with data description in low-dimensional feature space.
- ▶ The learning algorithm will employ different intrinsic and penalty graphs in the optimization process of multi-modal data description and enhance the computational efficiency and better predictive modeling of data in an optimized low-dimensional feature space.
- ▶ The developed advanced multi-modal graph-embedding techniques will be applied in a multisensory environment

Benefits to IAB

- ▶ The predictive model receives multimodal input from physiological data sensors, outputs the stress level, and determines the possible changes in data collected by a single sensor, causing an increase in stress levels.
- ▶ This information is used for analyzing the influence of data obtained from different sensors on an empathic building platform.
- ▶ The developed methods will be useful for stress-detection, anomaly detection, abnormal behavior/event detection, self-monitoring (wellbeing).

Project Accomplishments

- ▶ Collection of Videos (for emotion extraction) and wrist band data from 6 human subjects completed.
- ▶ The wrist band data contain galvanic skin response, heart rate, and skin temperature under different stress levels.
- ▶ The data is collected and synchronized under the protocols discussed and agreed with collaborating partners (University of Louisiana at Lafayette) and approved by the ethics committee of the Tampere region after a thorough review.
- ▶ Initial pre-processing of collected data completed.

Deliverables/Steps & Timeline

Deliverables/Steps	Start Date	Completion Date
Mathematical modelling	Sept 2021	December 2021
Identifying and pre-processing datasets along with setting up experimental protocols.	Sept 2021	January 2022
Implementation of graph-embedded subspace learning method, Initial experiments, analysis and comparison with other similar methods.	January 2022	April 2022
Efficient implementation and visualization of data in shared subspace.	March 2022	June 2022
Verification, finalizing and publishing results.	June 2022	Sept 2022

NOTES: This is a joint collaboration between TAU and ULL

Questions?