

Research Trip Summary Report

Task 2. Foreign mobility of WUST doctoral students

I. Data of the doctoral student

1. Full name: Bartosz Perz
2. Year of studies: 3
3. Educational discipline: Information and communication technology

II. Foreign research trip (research visit)

1. Research institute in which the foreign research was implemented: University of Southern California
2. Name and surname of the host person (mentor): Shrikanth S. Narayanan
3. Dates of the research trip: 11.03.2023 - 30.05.2023
4. Title and date of a seminar delivered during the research trip: *Early results of using TILES ECG representations as a backbone for emotion recognition models in subject-agnostic and mixed-subjects scenarios on CASE dataset*, 20.04.2023
5. Description of work carried out during the research trip:
 - Analyzing existing datasets and deciding on the dataset to use for experiments.
 - Learning the structure of the project repository used for experiments in TILES ECG representation learning project.
 - Designing experiments on Continuously Annotated Signals of Emotion (CASE) – planning which models (recurrent and fully connected, with ResNet and S4 models as backbones), data processing methods (filtering, methods of normalization and standardization), and validation methods (subject-agnostic and mixed-subjects) to use.
 - Writing code for performing planned experiments (dataset, models, and training) that could be incorporated into the project repository.
 - Running experiments, analyzing obtained results, and discussing them with the team from the host institute.
6. Description of the main results obtained:

The following results have been obtained:

 - Code for performing the experiments on CASE dataset using TILES ECG representation models as a backbone.
 - Results of emotional state regression experiments (arousal, valence) on CASE dataset in subject-agnostic and mixed-subjects scenarios.

- Results of classification experiments (high/low arousal and valence classification) on CASE dataset in subject-agnostic and mixed-subjects scenarios.

Obtained results indicate that including personal information during training machine learning models improve the inference quality on emotion recognition tasks in most of the examined tasks. Different methods of processing the data with respect to personal qualities and subjective perception impact the emotion recognition quality in different ways. Obtained results will serve as a starting point for further investigations on using representation of physiological signals, and will serve as an important part of research for the doctoral thesis.

7. Future collaborations (if applicable):

Preparation of the manuscript on representation learning from in-the-wild ECG.

8. Title and date of a seminar presenting the results of the trip delivered at Wrocław University of Science and Technology after returning from the research trip: *Personalization of emotion recognition from physiological signals* - 27.06.2023

III. Doctoral student's signature

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(Date)

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(doctoral student's signature)

IV. Confirmation and information from the host

1. Confirmation of compliance of the information contained in the report: I CONFIRM / DO NOT CONFIRM. (*In justified cases, the confirmation of the host may be sent by e-mail to the Dean's Office of the Doctoral School email: interdocschool@pwr.edu.pl*)

2. Additional information and comments

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(Date)

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(signature(s) of Host)