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Notice for the PhD Viva-Voce Examination

Ms Saba Tahseen (Registration Number: 1870082), PhD scholar at the School of Engineering and Technology, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Friday, 15 November 2024 at 11.15 am in the CDI Conference Room, III Floor, Block V, Bangalore Kengeri Campus, Bengaluru 560074.

Title of the Thesis	:	**Fuzzy Rule-Based Multimodal Health Monitoring System Leveraging Machine Learning Techniques Using EEG Datasets for Human Emotion and Psychological Disorders**
Discipline	:	**Computer Science and Engineering**
External Examiner - I	:	**Dr G Sreedhar** Professor Department of Computer Science National Sanskrit University Tirupati – 517 507 Andhra Pradesh
External Examiner – II	:	**Dr Chiranji Lal Chowdhary** Associate Professor School of Computer Science Engineering and Information Systems Vellore Institute of Technology, Vellore Tamil Nadu - 632014
Supervisor	:	**Dr Ajit Danti** Professor (Former) Department of Computer Science and Engineering School of Engineering and Technology CHRIST (Deemed to be University) Bengaluru – 560074 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar

Place: Bengaluru
Date: 06 November 2024

ABSTRACT

In the last few decades, machine learning and data analysis methods have been increasingly applied in the field of psychology to diagnose and treat psychological disorders. One area of particular interest is the use of electroencephalography (EEG) brainwave data to classify emotional states and predict psychological disorders. The study proposed a feature selection strategy using data fusion techniques and a multi-layer Stacking Classifier, which combines support vector classifier, Random Forest, multilayer perceptron, and Nu-support vector classifiers. Features were selected based on Linear regression-based correlation coefficient scores, resulting in a dataset with 39% features out of 2548. The suggested framework achieved a substantial level of precision of 98.75% in identifications of emotions, and for psychological disorders proposed GA-GB model achieved 97.21% accuracy. The proposed system employed fuzzy logic to calculate a health score that combines the outputs of the emotional and psychological disorder monitoring models.

Keywords: EEG Dataset, Emotions Recognition, Psychological Disorders, Fuzzy logic, PhQ-9, Multimodal Health monitoring system.

Publications:

1. Saba Tahseen and Ajit Danti, "Multi-layer Stacking-based Emotion Recognition using Data Fusion Strategy" International Journal of Advanced Computer Science and Applications (IJACSA),13(6),2022.http://dx.doi.org/10.14569/IJACSA.2022.0130654/**Scopus(Q3)**
2. Saba Tahseen and Ajit Danti, "Classification of Psychological Disorders by Feature Ranking and Fusion using Gradient Boosting" International Journal of Advanced Computer Science and Applications (IJACSA),14(2),2023.http://dx.doi.org/10.14569/IJACSA.2023.0140235/**Scopus(Q3)**
3. S. Tahseen and A. Danti, "Recognition Of Human Emotions Based On EEG Brainwave Signals Using Machine Learning Techniques-A Comparative Study," European Chemical Bulletin, vol. Volume-12, no. Special Issue-10, pp. 218–230, Jul. 2023, doi: doi: 10.48047/ecb/2023.12.si10.0024. **Scopus(Q3)**
4. Saba Tahseen and Ajit Danti "Relevance of psychophysiological and emotions features for the analysis of Human behavior-A Survey", 022 *ECS Trans.* **107** 607 https://doi.org/10.1149/10701.0607ecst **Scopus Indexed(Q3)**
5. Tahseen, S., Danti, A. (2022). Prediction of User's Behavior on the Social Media Using XGB Regressor. In: Saraswat, M., Sharma, H., Balachandran, K., Kim, J.H., Bansal, J.C. (eds) Congress on Intelligent Systems. Lecture Notes on Data Engineering and Communications Technologies, vol 111. **Springer, Singapore**. https://doi.org/10.1007/978- 981-16-9113-3_36 **Scopus Indexed(Q3)**