Assignment 4 [CO2,CO3]

Problem

As discussed in the lectures, EDA can capture Psychological aspects like arousal, stress, cognitive load, etc. In this assignment, each team will address a Psychological factor that impacts a student's course performance (class performance/assignments/quizzes/projects/semesters). Upon identifying such factor(s), the team will design a study setup and collect EDA data from one (or more) team members from their respective teams with their consent (the informed consent form needs to be signed and submitted with the assignment).

During the experiment, the participant(s) will need to wear the Empatica Smartwatch for the collection of EDA data. The total span of the study should be 30-40 mins as Empatica generates log files every ~30 min.

After collecting the data, the team will need to analyze the data in terms of SCL and SCRs (peak frequency, amplitude estimation, etc.) and write a report on their finding. The objective of this assignment is to explore whether and to what extent EDA can indicate the magnitude (for example, level of stress/arousal/etc) and direction (for example valence) of psychological factors.

For more details, you may refer to this paper: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7318762

Hint: Distractions like notifications (informative, emergency, reminders, ads, etc), secondary tasks (rough work, eating, checking emails, etc.), and other factors can increase the cognitive load of a student appearing for an examination/presentation. Similarly, factors like time-bound questions, negative scoring, etc. can add to the stress. Several other factors can promote or hinder a student's performance. You should consider such aspects and simulate them during the study to get variations in the EDA data.

The use of other modalities such as iPPG is optional. However, valid usage of iPPG along with EDA to provide a deeper insight will lead to bonus scores.

The technical report should include:

1. Introduction: A brief description of the identified challenges to a student's performance and the potential of EDA to identify such psychological aspects.
2. Study Design: Psychological factors addressed, study setup, data collection procedure, etc. This section may include images of the study setup (please blur the participant's face in this case).
3. Analysis: How the data has been analyzed (features, ML model used (optional), etc.)?
4. Results: Findings should be presented in writing as well as through figures, graphs, charts, tables, etc.
5. Conclusion

Submission

Each team will be submitting a 2-3 paged technical report using the following (online) Overleaf template: https://www.overleaf.com/latex/templates/tau-class-lab-report-template/chhshmhxstsq. Submissions in other formats will not be graded.

Each team must submit a PDF version of the report. The signed consent form should be scanned and submitted along with the report. The submission deadline is **14th April 2025 (hard deadline)**.

Note: The study should be conducted in the PerSIsst Lab (A-413, R&D building), and the Empatica device should be used exclusively within the laboratory. Due to the limited availability of resources, each team must pre-book a 60-minute slot as soon as possible by emailing me. The study must be completed at least five days before the deadline. To prevent a last-minute rush, teams are urged to plan their study and book their slots promptly. No extensions to the deadline will be granted for this final assignment.