Research Internship Offer In Artificial Intelligence at Sorbonne University (Master): Multimodal Data Analysis and Machine Learning to Predict Student's Levels of Attention in Education

With the rise of remote and hybrid education, educational videos play an increasingly important role. However, designing and learning from these videos generate new challenges both to the teachers and the students. For teachers, it is hard to understand how students process and attend to the key points of the videos. For students, they are bound to learn the videos on their own, without the help they could get from their teacher in the classroom.

In this internship, our goal is to leverage artificial intelligence to merge and process multimodal student data to predict in real time their levels of attention during watching of an educational video. Multimodal data are data that comes from multiple data sources. In this project, we leverage three data sources that inform about the behaviors of the student: 1/ eye tracking that captures the eye movements on the screen; 2/ webcam that can reveal facial expression and posture; 3/ the interaction logs with the video (e.g., pausing, panning…). The levels of attention to be mapped to these behaviors will be inferred using an ad-hoc methodology grounded in psychology and cognitive sciences research, thus providing labels for the AI models. This work will be supervised by two AI professors as well as by a professor who design educational videos and has a strong interest in this research. The work will be in collaboration with a PhD student at the Pedagogy and Experiment Center (Capsule, *capsule.sorbonne-universite.fr*) at Sorbonne University that supports pedagogical innovations and educational data analysis. The long-term goals are both to help students sustain their attention to key moments of the videos, and to offer teachers with ways to understand how students attend to their videos.

The core research of this internship is in designing, implementing and evaluating AI models/tools to predict from the aforementioned multimodal data the levels of attention of students watching an educational video. These models/tools should handle the heterogeneity and asynchronous nature of the multimodal data. To do so, we have already collected for this internship a dataset of students' behaviors while watching a video as part of an undergraduate (L2) course about green chemistry. The intern will also have the opportunity to collect additional data as needed.

The expected skills to carry out this internship are as follow:

- Familiarity with supervised machine learning and data science
- Demonstrated experience with Python, especially with an IA library such as sklearn or keras

This is a 6-months paid internship at the M2 level (i.e., the 2nd year of a master program) or equivalent. The intern is expected to work at Sorbonne University (4 Place Jussieu, 75005 Paris), not remotely. The internship will be supervised by Vanda Luengo and Sébastien Lallé from the LIP6 laboratory (the Computer Science Lab of Paris 6), and by Ali Abou-Hassan from the PHENIX laboratory (the Physical chemistry of Electrolytes and Interfacial Nanosystems Lab). The internship is expected to start early 2023 (January/February), or shortly thereafter.

To apply, please send a CV and a self-introduction email to the email addresses below. Any questions about this posting are welcome via email as well.

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