Master Thesis Proposal

Analyzing Differences in Social Signals of Understanding during Stressful and Neutral Situations

WHAT IS THIS PROJECT ABOUT?

Understanding is a vital part of human communication. During an explanation, the explainer monitors the explainee's signals of understanding and adapts their explanation methods accordingly [1]. However, there is limited research investigating what social signals, such as eye gaze, head movement, and facial expressions, are connected to understanding. Additionally, there is little research on the effects of stress on these social signals.

In this thesis, we aim to address this problem by identifying which facial action units correlate most with understanding and confusion in stressful and neutral conditions respectively. This can be done by analyzing a dataset containing video recordings of participants during an explanation scenario. During two scenarios, a stressful and a neutral one, the participants annotated both recordings with their perceived level of understanding, acting as a ground truth. The data has already mostly been collected in a previous study, so this thesis deals mainly with analyzing the data. However, depending on the progress of the thesis, additional data collection may be also part of the thesis.

Analyzing social signals such as eye gaze, head movements, and facial action units, and connecting them to perceived understanding could allow important progress in our understanding of understanding and the development of explainable AI.

PROJECT REQUIREMENTS

• Experience with coding in Python
• Interest in data analysis

REFERENCES

[1] Rohlfing K, Cimiano P, Scharlau I, et al. Explanation as a social practice: Toward a conceptual framework for the social design of AI systems. *IEEE Transactions on Cognitive and Developmental Systems*. 2021;13(3):717--728.

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