Hauptseminar “Machine Learning Approaches to Understanding User Behavior”

Introduction
How can we improve interactions between people and machines? One approach is to increase the information exchange. When humans interact with each other, a substantial part of the exchange is implicitly inferred. So far, machines have difficulty understanding this exchange. However, researchers in the fields of Human-Computer Interaction (HCI) and Artificial Intelligence (AI) are building machines able to represent the “inner life” of other agents. These machines learn to estimate mental states, like beliefs, desires, intentions, emotions or mental images.

This seminar investigates these machines by disentangling their methods and their underlying concepts. It will cover HCI approaches and state-of-the-art techniques from multi-agent systems, social signal processing and affective computing, natural language processing, and reasoning. Moreover, it will introduce important concepts from psychology, behavioral science and cognitive science to understand user behavior.

Learning outcomes
The goal of the seminar is to familiarize students with exciting new research topics in human-computer-interaction, in particular behavioral inference. Moreover, the seminar teaches basic scientific writing and oral presentation skills. After completing the seminar, students will have acquired theoretical knowledge about the most important problems in machine understanding of human behavior and how to leverage such understanding in the design of intelligent user-facing technologies.

The core competency acquired through this course is the ability to understand and evaluate state-of-the-art publications and algorithms that address the processing and interpretation of human input in computer systems. Prerequisite to attending the seminar is a solid foundation in machine learning.

Implementation
The seminar will have a different structure from regular seminars to encourage more discussion and a deeper learning experience: We will use a case-study format where all students read the same papers each week but fulfill different roles and hence prepare with different viewpoints in mind:
• **Presenter:** Give a talk about the paper that you read in depth.

• **Ethicist:** Think about the impact of the paper more broadly, including ethical implications for individuals and society. Describe scenarios how the proposed method could improve live or how its wide use could be a risk.

• **Historian:** Find out how this paper sits in the context of the related work. Use bibliography tools to find the most influential papers cited by this work and at least one paper influenced by the work (and summarize the two papers briefly).

• **Inventor:** Prepare a short presentation on an invention based on the paper, as if you were trying to convince investors.

• **Journalist:** After the presentation, write an article about the paper that can be understood by the general public; include points from the general discussion during the seminar, the historian, or the PhD student.

• **PhD student:** Propose a follow-up project for your own research based on this paper - importantly the project should be directly inspired by the paper or use/extend the method proposed.

• **Politician:** Think of ways this research could be misinterpreted, on purpose or not, to advance a political agenda.

• **All students** (every week): Come up with an alternative title; did the paper miss anything? What are its key limitations?

**Requirements**

This research seminar is intended for **Master students** in Computer Science, Visual Computing, Media Informatics, and Computational Linguistics. Students should have a **good understanding of machine learning, and/or human-computer interaction. Prior attendance of lectures in these areas is required.** Attendance in the weekly meetings is mandatory. The final grade will be composed of individual grades for the respective task each week as well as active participation in the discussions.

**Date & Time**

Available space: max 15 students

**Term**

WS 2020

**Language**

English

**Contact**

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