

Linus Holmberg

PHD STUDENT · HUMAN-AI INTERACTION · EXPLANATIONS

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“Making systems understandable and useful to all.”

Summary

I am a PhD student in cognitive science who loves asking questions and figuring out ways to answer them. With a background in both cognitive science and data science, I have an understanding of both sides of human-AI interaction. My interests lie in making systems understandable and useful to all users. My dissertation is about how explanations influence mental models, and how mental models influence how explanations and behaviors are interpreted. However, as you can see in my research outputs and collaborations, my research interests are broader than that.

Research Experience

Ph.D. Researcher

Jönköping, Sweden

JÖNKÖPING UNIVERSITY (DEPARTMENT OF COMPUTER SCIENCE AND INFORMATICS)

Oct. 2023 - Present

- Research (80%): Employed in the research project XPECT. My primary focus is on explanations and mental models of AI systems.
- Teaching Activities (20%): Supervising Bachelor's Theses in two programs, New Media Design and Computer Technology. I'm also teaching in an introductory Python course.

Machine Learning-Intern

Gothenburg, Sweden

VOLVO GROUP (AI-CORE)

Jul. 2023 - Nov. 2023

- Evaluated the performance of different indexing methods in a vector database for an internal RAG system.

Associate Researcher

Gothenburg, Sweden

UNIVERSITY OF GOTHENBURG, (DEPARTMENT OF OCCUPATIONAL AND ENVIRONMENTAL MEDICINE)

Oct. 2022 - Jun. 2023

- Employed in the LEON-T research project where we investigated (tire) noise influence on sleep (metabolism & cognitive function).
- Responsibilities: Participant recruitment, data collection and control (EEG & cognitive tests), and initial data analysis.

Research Assistant

Stockholm, Sweden

CLEBO CONSULTING AB

Aug. 2021 - Feb. 2022

- Wrote a scientific paper manuscript and was responsible for data analysis.
- Lectured about psychological biases to the jury members' association.

Education

Ph.D. in Cognitive Science

Linköping, Sweden

LINKÖPING UNIVERSITY (DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE, HUMAN-CENTERED SYSTEMS)

Oct. 2023 - Present

- Employed in a research project focusing on user-centered Explainable AI, XPECT.
- Supervisors: Prof. Tom Ziemke (Linköping University, Sweden), Prof. Maria Riveiro (Jönköping University, Sweden), Ass.Prof. Serge Thill (Radboud University, Netherlands).
- (Self-Initialized) Collaborations: Mental Health Chat-bot (Lund University), AI-Support for Social Service Risk Assessment (Lund University & Linköping University).

M.Sc. in Applied Data Science

Gothenburg, Sweden

UNIVERSITY OF GOTHENBURG (DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING)

Aug. 2022 - Jun. 2024

- Including courses such as: Python, ML/DL, Large Scale Data, Databases, Statistics, Methods (quantitative).
- Thesis: *Leveraging Large Language Models to Generate Natural Language Explanations of AI Systems: A Framework for Natural Language Explanations*

MA in Cognition & Communication

Copenhagen, Denmark

UNIVERSITY OF COPENHAGEN (DEPARTMENT OF HUMANITIES)

Aug. 2020 - Jun. 2022

- My focus was on human decision making.
- Including courses such as: Communication & Influence on Cognition, Methods (qualitative), Intern as a Research Assistant.
- Thesis: *Nudging Towards Sustainable Investments: The Swedish Premium Pension System*

B.Sc. in Cognitive Science

Gothenburg, Sweden

UNIVERSITY OF GOTHENBURG (DEPARTMENT OF APPLIED IT)

Aug. 2017 - Jun. 2020

- Cognitive science as the main subject.
- Including courses such as: Python, AI/ML, HCI, Decision Making, Social Cognition, Neurocognition, Scientific Method (quantitative)

Current Project Collaborations

Adapting AI-Explanations to Users' Expectations (XPECT)

JÖNKÖPING UNIVERSITY, PROF. MARIA RIVEIRO

- The main focus of the research project is on how to tailor explanations from AI Systems to Users' expectations.
- My primary focus in this project is on investigating how explanations influence mental models, but also how mental models influence how explanations are interpreted, and when explanations are wanted/needed.

Mental Health Chatbot

LUND UNIVERSITY, PROF. SVERKER SIKSTRÖM

- The project currently involves two systems, one for screening clinical diagnoses, and one for AI-based Cognitive Behavioral Therapy (CBT). This includes both the patient and clinician perspectives.
- I assist primarily with knowledge in Human-Computer/AI Interaction.

AI-Support for Social Service Risk Assessment

LUND UNIVERSITY, PROF. SVERKER SIKSTRÖM & LINKÖPING UNIVERSITY, ASS.PROF. LEONARD NGAOSUVAN

- The aim of this research is to aid custody evaluators in risk assessment.
- I assist primarily with knowledge within human decision making, and Human-Computer/AI Interaction. However, I've also assisted with the development of the tool(s).

Recent Research Outputs

[SUBMITTED]. **Holmberg, L.** & Thunberg, S. (2025). A Grid Space Based Investigation of Agent Behaviour Explanations. *In 20th SweCog Conference*, Lund, Sweden

[SUBMITTED]. Thunberg, S., **Holmberg, L.** & Obaid, M. (2025). Tracking Mental Models of a Humanoid Robot. *In 20th SweCog Conference*, Lund, Sweden

[SUBMITTED]. **Holmberg, L.**, Sikström, S., & Riveiro, M. (2025). Speaking or Writing? Do Response Times Influence Anthropomorphism Differently for ADHD and Neurotypical Users in a Mental Health Chatbot?. *In Proceedings of the 6th Conference on Conversational User Interfaces (CUI)*.

[ACCEPTED, in Press]. **Holmberg, L.**, Riveiro, M. & Ziemke, T. (2025). How do Levels of Automation in AI-Assisted Decision-Making Influence Cognitive Engagement?. *HAI-WS 2025*, June 09–13, 2025, Pisa, Italy

[ACCEPTED, in Press]. **Holmberg, L.** & Riveiro, M. (2025). Explanations of AI are Greater than Explainable AI. *In HAI 2025*.

[ACCEPTED, in Press]. Ngaosuvan, L., **Holmberg, L.**, Stille, L., Hagberg, J., Dahl, M., & Sikström, S. (2025). Usability Testing AI-Supported Social Service Risk Assessment System. *19th European Congress of Psychology*. In *European Journal of Psychology Open*.

[ACCEPTED, in Press]. **Holmberg, L.**, Sikström, S., Mirström, M., Lasorta, M., Stille, L., & Garcia, D. (2025). Users with ADD or ADHD are More Sensitive to Response-Times: Anthropomorphism of a Chat-Bot in Mental Health Assessment. *19th European Congress of Psychology*. In *European Journal of Psychology Open*.

Holmberg, L., Riveiro, M., & Thill, S. (2024). Leveraging Large Language Models for Tailored and Interactive Explanations in AI Systems. *In 19th SweCog Conference*, Stockholm, Sweden, 10–11 October, 2024 (pp. 27–31). Swedish Cognitive Science Society. swecog.se/files/SweCog2024_Proceedings.pdf