Linus **Holmberg**

PhD Student · Human-AI Interaction · Expectations · 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 finding ways to answer them. With a background in both cognitive and data science, I have a comprehensive understanding of the human-AI interaction from both sides. My interests lie in making systems understandable and useful to all users. My dissertation explores how explanations influence mental models and how mental models, in turn, shape the interpretation of explanations and behaviors. 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 - Oct. 2028 (Anticipated)*

- 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 - Oct. 2028 (Anticipated)*

- 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 Chatbot (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*

- I mainly focused 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.

Chatbots for Mental Health

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 and use their platform to investigate the users' perspective.

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 develop tools to aid custody evaluators in risk assessment of child maltreatment.
- I assist primarily with knowledge within human decision making and Human-Computer/AI Interaction.

Recent Research Outputs

[SUBMITTED]. **Holmberg, L.**, Sikström, S., & Riveiro, M. (2026). What Do Users (Not) Ask? Spontaneous Explanation-Seeking in Chatbot-Based Cognitive Behavioral Therapy.

[ACCEPTED, in Press]. **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?. *13th International Conference on Human-Agent Interaction (HAI 2025)*, Yokohama, Japan, 10–13 November, 2025. https://doi.org/10.1145/3765766.3765772

Holmberg, L., Riveiro, M. & Ziemke, T. (2025). How do Levels of Automation in AI-Assisted Decision-Making Influence Cognitive Engagement?. *HHAI-WS 2025*, June 09–13, 2025, Pisa, Italy. https://ceur-ws.org/Vol-4074/short3-4.pdf

Holmberg, L. & Riveiro, M. (2025). Explanations of AI are Greater than Explainable AI. *In HHAI 2025*. https://doi.org/10.3233/FAIA250645

Holmberg, L. & Thunberg, S. (2025). A Grid Space Based Investigation of Agent Behaviour Explanations [Abstract]. *In 20th SweCog Conference*, (pp. 44-45) Lund, Sweden. Proceedings

Thunberg, S., **Holmberg, L.** & Obaid, M. (2025). Tracking Mental Models of a Humanoid Robot [Abstract]. *In 20th SweCog Conference*, (pp. 56-57 Lund, Sweden. Proceedings

Ngaosuvan, L., **Holmberg, L.**, Stille, L., Hagberg, J., Dahl, M., & Sikström, S. (2025). Usability Testing AI-Supported Social Service Risk Assessment System [Abstract]. *19th European Congress of Psychology*. In the European Journal of Psychology Open, (pp. 212-213). https://doi.org/10.1024/2673-8627/a000085