Matteo Bortoletto

matteo.bortoletto@vis.uni-stuttgart.de ◇ GitHub ◇ Website ◇ LinkedIn

Education

University of Stuttgart, Germany Ph.D. in Computer Science *2022 - Present*
Advisor: Andreas Bulling

University of Padua, Italy M.Sc. in Physics of Data, *110/110 cum laude* *2019 - 2021*
Advisor: Marco Baiesi

University of Padua, Italy B.Sc. in Physics *2016 - 2019*
Advisor: Samir Suweis

Research & Work Experience

University of Stuttgart, Stuttgart, Germany *02/2022 - Present*
Scientific Researcher, Collaborative AI Lab – Conducted research on Machine Theory of Mind, multi-modality, large foundation models, and interpretability.

Johns Hopkins University, Baltimore, USA *04/2025 – 07/2025*
Visiting Graduate Scholar, Social Cognitive AI Lab – Led a project on Bayesian Theory of Mind for prosocial feedback communication in multi-agent systems.

Piratech, Kingston Upon Thames, London, England *03/2021 – 06/2021*
Intern – Worked in a team to create and deploy AWS infrastructures "as code" via Pulumi. Contributed to CI/CD integration.

Peer-reviewed Publications

1. M. Bortoletto, C. Ruhdorfer, A. Bulling. "ToM-SSI: Evaluating Theory of Mind in Situated Social Interactions." **EMNLP 2025**.

2. M. Bortoletto, C. Ruhdorfer, L. Shi, A. Bulling. "Brittle Minds, Fixable Activations: Understanding Belief Representations in Language Models." **EMNLP 2025 Findings** and **ICML 2024 Workshop on Mechanistic Interpretability**.

3. C. Ruhdorfer, M. Bortoletto, A. Penzkofer, A. Bulling. "The Overcooked Generalisation Challenge." **TMLR**, 2025.

4. C. Ruhdorfer, M. Bortoletto, A. Bulling. "The Yokai Learning Environment: Tracking Beliefs Over Space and Time." **IJCAI 2025 Worshop on Theory of Mind**. (Oral)

5. M. Bortoletto, C. Ruhdorfer, L. Shi, A. Bulling. "Explicit Modelling of Theory of Mind for Belief Prediction in Nonverbal Social Interactions." **ECAI 2024**. (Oral)

6. M. Bortoletto, C. Ruhdorfer, A. Abdessaied, L. Shi, A. Bulling. "Limits of Theory of Mind Modelling in Dialogue-Based Collaborative Plan Acquisition." **ACL 2024**.

7. M. Bortoletto, L. Shi, A. Bulling. "Neural Reasoning About Agents' Goals, Preferences, and Actions." **AAAI 2024**.

8. E. Sood, L. Shi, M. Bortoletto, Y. Wang, P. Müller, A. Bulling. "Improving neural saliency prediction with a cognitive model of human visual attention." **CogSci 2023**.

9. G. Zhang, M. Bortoletto, Z. Hu, L. Shi, M. Bâce, A. Bulling. "Exploring Natural Language Processing Methods for Interactive Behaviour Modelling." **INTERACT 2023**. *Best Student Paper Nomination*

Preprints

1. M. Bortoletto, Y. Zhou, L. Ying, T. Shu, A. Bulling. "ProToM: Promoting Prosocial Behaviour via Theory of Mind-Informed Feedback." *arXiv:2509.05091*, 2025.

2. C. Ruhdorfer, M. Bortoletto, V. Oei, A. Penzkofer, A. Bulling. "Unsupervised Partner Design Enables Robust Ad-hoc Teamwork." *arXiv:2508.06336*, 2025.

Teaching Experience

Course Organiser, Machine Perception and Learning *WS 2024*
Course Organiser and Lecturer, Computational Theory of Mind and Cognition *SS 2024*
Teaching Assistant, Machine Perception and Learning *SS 2022, WS 2022, WS 2023*

Mentoring

Mohamed Youssef, M.Sc. Thesis: "Ontology-Guided Diffusion for Zero-Shot Sim-to-Real Transfer"
Levi Otterbach, B.Sc. Thesis: "Neural Reasoning with Cognitively-Inspired Representations"
Jonas Allali, M.Sc. Thesis: "Probing for Theory of Mind in the Multi-Agent Cooperation Game Yokai"
Jann-Philipp Thewes, M.Sc. Thesis: "Multimodal LLM for Theory of Mind Modelling in Collaborative Tasks" *Bürkert University Prize*
Ruben Werbke, B.Sc. Thesis: "Inferring Other Agents' Goal in Collaborative Environments Using Graphs"
Constantin Ruhdorder, M.Sc. Thesis: "Into the Minds of the Chefs: Using Theory of Mind for Robust Collaboration with Humans in Overcooked" *Rul Gunzenhäuser Award*
John Pravin Arockiasamy, M.Sc. Research Project: "Transformer Based Architecture for Belief Prediction in Object-Context Scenarios"
Michael Erdemann, M.Sc. Thesis: "Recreating False-Belief Tests as Visual Question Answering Tasks"

Services

Evaluator: ELLIS PhD Program, IMPRS-IS PhD Program
Reviewer: CHI'24, CHI'25, ACL ARR'25, TOCHI, UIST'25, AAAI'26, EACL'26 SRW, ACL ARR'26
Student Volunteer: AAAI'24, ACL'24, EMNLP'25

Awards

Volunteer Scholarship AAAI'24, ACL'24, EMNLP'25
Best Student Paper Nomination INTERACT'23
StartCup Veneto Startup competition winner, TooBusy *2021*
Research Grant, University of Padua, "Urban Big Data for Economic Development" (€*4.3K*) *2021*

Events and Presentations

EMNLP 2025 poster presentation *2025*
Invited talk at the SCAI Lab, Johns Hopkins University *2025*
ECAI 2024 oral presentation *2024*
ACL 2024 poster presentation *2024*
ICML 2024 poster presentation *2024*
ELLIS CoGenAI Summer School (Aalto University, Finland) *2024*
ELLIS Unit Stuttgart Summer Symposium *2024*
AAAI 2024 poster presentation *2024*
ELLIS Unit Stuttgart Kickoff Symposium *2023*
Dagstuhl Seminar on Anticipatory Human-Machine Interaction *2022*

Skills

Languages: English (fully proficient), Italian (native), Spanish (basic), German (basic)
Software & Tools: Python, Julia, Numpy, Pandas, Scikit-learn, Linux, Git, LaTeX, HTML
Deep Learning Frameworks: PyTorch, transformers, NNsight, LangChain, ChromaDB, Ollama, Weights & Biases
Hobbies and activities: Watercolour painting, guitar, running