Matteo Bortoletto

Ph.D. Student at the University of Stuttgart

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EDUCATION

Johns Hopkins University, USA Visiting Graduate Scholar   *2025*
Worked at the SCAI Lab, leading a project with collaborators from JHU, Harvard, MIT, and PKU.
Advisor: Tianmin Shu

University of Stuttgart, Germany Ph.D. in Computer Science   *2022 - Present*
Conducted research on Machine Theory of Mind, multi-modality, large foundation models, and interpretability.
Advisor: Andreas Bulling

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

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

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

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"
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"

WORK EXPERIENCE

University of Stuttgart, Scientific Researcher *2022 - Present*
University of Padua, Research Fellow *2021*
Piratech, Intern *2021*

SERVICES

Evaluator for the ELLIS PhD Program
Reviewer: CHI'24, CHI'25, ACL ARR'25, TOCHI, UIST'25, AAAI'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 Start up 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*

MISCELLANEOUS

Nationality: Italian
Languages: English (fully proficient), Italian (native), Spanish (basic), German (basic)
Programming: Python, PyTorch, Huggingface, NNsight, Julia
Software & Tools: Linux, MacOS, Git, LaTeX, Microsoft Suite
Hobbies and activities: Watercolour painting, guitar, swimming, running