Cansu Sancaktar

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Education

2021 – present ◇ **Ph.D. Computer Science,** Max Planck Institute for Intelligent Systems & University of Tübingen, supervised by Prof. Georg Martius.

➤ Intrinsically Motivated Open-ended Learning, Unsupervised Exploration in Reinforcement Learning (RL), Model-based RL and Robot Learning

2018 – 2021 ◇ **M.Sc. Electrical Engineering and Information Technology**, Technical University of Munich.
Graduated with High Distinction, GPA 4.0/4.0 (German grading system: 1.0)

➤ Specialization in Robotics and Machine Learning

2015 – 2021 ◇ **B.Sc. Electrical Engineering and Information Technology**, Technical University of Munich.
Graduated with High Distinction, GPA 4.0/4.0 (German grading system: 1.0)

2010 – 2015 ◇ **German Foreign High School, Abitur Diploma**, Istanbul Lisesi.
GPA 4.0/4.0 (German grading system: 1.0), Graduated as top of my class.

Work Experience

July – Nov 2024 ◇ **Research Internship,** Qualcomm AI Research, Amsterdam.
Robotics team.

Apr 2017 & Sep–Oct 2017 ◇ **Research Engineering Internship,** Intel, Munich.
Computational cost estimation of machine learning algorithms for LTE modem power optimization

Publications

Cansu Sancaktar*, Christian Gumbsch*, Andrii Zadaianchuk, Pavel Kolev and Georg Martius. SENSEI: Semantic Exploration Guided by Foundation Models to Learn Versatile World Models, **Workshop on Training Agents with Foundation Models at RLC 2024**. [Project Page]

Albane Ruaud, **Cansu Sancaktar**, Marco Bagatella, Christoph Ratzke and Georg Martius. Modelling Microbial Communities with Graph Neural Networks, **ICML 2024**. [Project Page]

Cansu Sancaktar, Justus Piater and Georg Martius. Regularity as Intrinsic Reward for Free Play, **NeurIPS 2023**. [Project Page, Code]

Bhavya Sukhija, Lenart Treven, **Cansu Sancaktar**, Sebastian Blaes, Stelian Coros and Andreas Krause. Optimistic Active Exploration of Dynamical Systems, **NeurIPS 2023**.

Cansu Sancaktar, Sebastian Blaes and Georg Martius. Curious Exploration via Structured World Models Yields Zero-Shot Object Manipulation, **NeurIPS 2022**. [Code]

- Best poster award at the IEEE RAS Technical Committee on Model-Based Optimization for Robotics poster event 2022.

Nico Gürtler, Felix Widmaier, **Cansu Sancaktar**, ... and Georg Martius, Real robot challenge 2022: Learning dexterous manipulation from offline data in the real world., **NeurIPS 2022 Competition Track**.

Cansu Sancaktar, Marcel van Gerven, and Pablo Lanillos. End-to-End Pixel-Based Deep Active Inference for Body Perception and Action, 10th International Conference on Development and Learning and Epigenetic Robotics **(ICDL-EpiRob), IEEE, 2020**. [Poster presentation, Code]

Honors & Awards

2024 ◇ **MPI-IS Outstanding Female Doctoral Student Prize: Honorable Mention.**

2017 – 2021 ◇ **Scholarship Holder of the Max Weber-Program.**
This program aims at highly gifted students at universities in Bavaria.

2015 – 2020 ◇ **DAAD Scholarship Holder.**
A merit-based scholarship granted for my studies in Germany.

Aug 2014 ◇ **Selected Attendee at the 8th Asian Science Camp.**
Chosen as one of the 8 representatives of Turkey at the 8th Asian Science Camp which is an event organized by Nobel laureates.

Professional Activities

Workshops & Competitions

2023 & 2024 ◇ Co-organizer of the workshop **Intrinsically Motivated Open-ended Learning, NeurIPS 2023 & 2024**.

2022 ◇ Co-organizer of the competition **Real Robot Challenge III - Learning Dexterous Manipulation from Offline Data in the Real World, NeurIPS 2022**.

Outreach

2022 – present ◇ Member of the coordination team of the S4 Seminar Series of the IMPRS-IS graduate program.

2022 - 2023 ◇ Elected student representative of the IMPRS-IS graduate program for MPI-IS Tübingen.

2021 - 2022 ◇ Co-organizer of the scientific Talk & Talk series at the Max Planck Institute for Intelligent Systems.

Teaching & Supervision

2024 ◇ **Jiaqi Chen, ETH Zürich**, Master's Thesis (ongoing)

◇ **Pulkit Goyal, University of Tübingen**, Master's Thesis: *Building Visual Semantic Bias in Curious Exploration during Free Play*.

2023 ◇ **Pro-seminar in Reinforcement Learning**, University of Tübingen.

◇ **Pulkit Goyal, University of Tübingen**, Essay Rotation: *Can Self-Exploring (Curious) RL Agents Model OCD?*

◇ **Shukrullo Nazirjonov, CaCTüS Internship**, *Extending Intrinsically Motivated Reinforcement Learning to Real Robots*.

Theses

2021 ◇ **Master's Thesis:** State-Space Models for Discovering Low-Dimensional Dynamics in Neurophysiological Recordings
➤ Advisor: Prof. Jakob Macke, *Machine Learning in Science*, University of Tübingen.

2018 ◇ **Bachelor's Thesis:** Long Short-Term Memory Networks as Adaptive Filters
➤ Advisor: Prof. Wolfgang Utschick, *Methods of Signal Processing*, TUM.

Skills

Languages ◇ Turkish (native), English (C2), German (C2), Korean (A1).

Programming ◇ Python, C, C++, MATLAB, Html, Linux/Shell Script.

Frameworks ◇ PyTorch, Tensorflow, JAX, Keras.

Robotics ◇ ROS, Gazebo, Arduino.

Misc. ◇ LaTeX, Inkscape, Simulink.

Invited Talks

- BeNeRL Seminar Series, *Nov 2023*.
- Human and Machine Cognition Lab (Charley Wu) at the University of Tübingen, *Nov 2023*.
- Computational Principles of Intelligence lab (Eric Schulz) at Max Planck Institute for Bioogical Cybernetics, *Mar 2023*.
- Scientific talk at the 2023 IMPRS-IS Interview Symposium, *Jan 2023*.