

# Johannes Ratz

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## Education

<b>Karlsruhe Institute of Technology (KIT)</b> , M.Sc. Computer Science	10/2016 – 01/2025
<ul style="list-style-type: none"><li>• Final grade: 1.8</li><li>• Focus areas: Artificial Intelligence, Reinforcement Learning, Medical Technology</li></ul>	
<b>Aalto University, Espoo, Finland</b> , Exchange Semester: Computer Science, Master's level	08/2022 – 12/2022
<b>St. Paulusheim Gymnasium</b> , Abitur (German university entrance qualification)	06/2016

## Experience

<b>Fraunhofer Institute of Optronics, System Technologies and Image Exploitation</b> IOSB, Working Student	12/2020 – 10/2023
<ul style="list-style-type: none"><li>• Worked with physiological sensors (EEG, ECG, GSR, etc.), developed experiment software in Java, analyzed data, and authored and presented scientific papers</li></ul>	
<b>Freelance Web Designer</b>	Since 01/2020
<ul style="list-style-type: none"><li>• Independently planned, designed, and implemented websites</li></ul>	

## Publications

<b>Diverse and Adaptive Behavior Curriculum for Autonomous Driving: A Student-Teacher Framework with Multi-Agent RL</b> (DOI: 10.48550/arXiv.2507.19146)	03/2025
<b>Measuring Flow: Perceived Emotions &amp; Arousal-Valence</b> (DOI: 10.54941/ahfe1004743)	07/2024
<b>Using Electroencephalography to Survey the Physiology of Immersion and Flow</b> (DOI: 10.33965/MCCSIS2023_202304L021)	07/2023
<b>Measuring Game Immersion and Flow with Electroencephalography</b> (DOI: 10.33965/ihci_get2021_202105L016)	07/2021

## Projects

<b>Master's Thesis: Robust Reinforcement Learning via an Automatic Curriculum of Agents' Driving Behavior with Increasing Difficulty</b>	07/2024 – 01/2025
<ul style="list-style-type: none"><li>• Developed a novel multi-agent reinforcement learning system for training autonomous vehicles using adaptive curriculum learning</li></ul>	
<b>Intelligent Actor Control for Optical Sorting Using Deep Reinforcement Learning</b>	04/2023 – 12/2023
<ul style="list-style-type: none"><li>• Evaluated various intelligent optical sorting systems using online planners and deep RL techniques (PPO, SAC)</li></ul>	
<b>Bachelor's Thesis: EEG Measurement in the Context of Flow and Immersion</b>	12/2020 – 04/2021
<ul style="list-style-type: none"><li>• Designed an experiment for objectively measuring states of flow and immersion using EEG data</li></ul>	

## Skills and Interests

**Languages:** English (C1), basic knowledge of French, Japanese, and Swedish

**Technologies:** Python, PyTorch, Pandas, Java, Git, JavaScript, HTML, CSS, Angular, R, MATLAB

**Hobbies and Interests:** Badminton, playing piano, programming, traveling