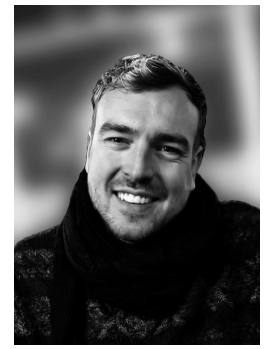


# Justus F. Hübötter

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Curiosity-driven AI researcher working at the intersection of brain-inspired models, reinforcement learning, and robotic control. I enjoy turning complex ideas into working systems – from small tools and projects to large scale neural networks. Beyond my PhD, I like exploring audio-visual art with AI and thinking critically about where these technologies can be put to best use.

## EDUCATION

<b>Radboud University, Donders Institute</b> , Nijmegen, NL PhD Candidate in Artificial Intelligence (expected graduation 2026)	2021 – present
<b>Vrije Universiteit</b> , Amsterdam, NL MSc Artificial Intelligence, <i>cum laude</i> MSc Neuroscience (Research)	2019 – 2021 2017 – 2019
<b>University of Applied Sciences</b> , Bremen, DE BSc Biomimicry (Bionik) International Studies	2013 – 2017

## RESEARCH EXPERIENCE

<b>Radboud University – Donders Institute</b> PhD Thesis – <i>Spiking Neural Networks for Robotic Control</i>	2021 – present
<ul style="list-style-type: none"><li>Design and train spiking neural networks as predictive models for robotic control using PyTorch and Isaac Sim.</li><li>Develop and evaluate reinforcement learning algorithms and noise-based gradient estimation methods.</li><li>Run large-scale simulation experiments on HPC clusters, maintain reproducible research pipelines.</li><li>Collaborate in an EU research consortium (Human Brain Project), co-author peer-reviewed papers, and supervise student projects.</li></ul>	
<b>Vrije Universiteit Amsterdam – Artificial Intelligence</b> Teaching Assistant and Grant Support	2020 – 2021
<ul style="list-style-type: none"><li>Computational Intelligence and Evolutionary Computing courses: lab supervision, assignment design and grading.</li><li>Contributed to a Marie Skłodowska-Curie ITN grant proposal for a European research network on social robotics.</li></ul>	
<b>Amsterdam UMC – Neurosciences</b> Research Internship – <i>Predicting cognitive profiles in MS from fMRI networks</i>	2018
<b>German Research Center for AI (DFKI)</b> Research Assistant – <i>Deep EEG signal processing with CNNs</i>	2017
<b>National University of Singapore – SINAPSE</b> Research Internship – <i>Neuromorphic haptic feedback systems for VR</i>	2015

## SELECTED PROJECTS

- JobCrawler: Agentic LLM-Based Web App for Job Discovery**  
Built a full-stack web app where LLM agents autonomously discover, classify, and track organisations worldwide based on user-defined fields of interest. [GitHub](#)
- Interactive Music – Real-Time Music Generation for Dance Performance**  
Co-developed and showcased closed-loop system where AI-controlled music generation responds to live human dancers and vice versa.
- AI Song Contest 2022 Final Performance**  
Participated in the AI Song Contest 2022 finale with a hybrid human–AI music project, using generative audio models.

## SELECTED PUBLICATIONS

- J. Hübötter et al. **Spiking Control – A Review**. *In preparation*
- J. Hübötter et al. **Mixed Gradient Descent – A Systematic Reevaluation of Noise-Based Gradient Estimation in Neural Networks**. *In preparation*
- J. Hübötter et al. (2025) **Spiking Neural Networks for Continuous Control via End-to-End Model-Based Learning**. *Under review* [arXiv](#)
- J. Hübötter et al. (2023) **Learning Policies for Continuous Control via Transition Models**. *CCIS, vol 1721* [DOI](#)
- J. Hübötter et al. (2021) **Training Deep Spiking Auto-encoders with Regularization**. *Preprint* [arXiv](#)
- F. Sorgini et al. (2016) **Design of Haptic Devices for VR**. *IEEE BioRob* [DOI](#)

## SKILLS

**Machine Learning & Control:** Deep learning, reinforcement learning, spiking neural networks, model-based control  
**Software & Tools:** Python, PyTorch, R, SQL, Git, Linux, Bash, LaTeX, Docker, NVIDIA Isaac Sim, Weights and Biases  
**Research & Collaboration:** Experimental design, large-scale simulation on HPC clusters, scientific writing, project management, student supervision, grant contribution, cross-disciplinary teamwork  
**Languages:** German (native), English (fluent)