Nikola Milošević

PhD Researcher — Reinforcement Learning

milose.nik@gmail.com | milosen.github.io | Leipzig, Germany

Research Interests

Foundations of reinforcement learning: theory of policy optimization, constrained and convex Markov decision processes, and the mathematical foundations of learning and control. Broader interest in connecting these tools to models of learning in biological and artificial agents.

Education

2022 – present **PhD Researcher, Reinforcement Learning** — MPI CBS Leipzig

Neural Data Science Lab (advisor: Nico Scherf) at MPI for Human Cognitive and Brain Sciences. Affiliated with ScaDS.AI Leipzig.

- Developing tools from information geometry and constrained optimization to improve the reliability of deep reinforcement-learning algorithms.

2019 – 2021 **M.Sc., Electrical Engineering & Information Technology** — HTWK Leipzig

Final grade 1.2 (German scale).

- Thesis: *Segmentation of Ultra-High-Field MRI Brain Images for Multi-Parameter Mapping using Deep Learning* — a variational-autoencoder approach to unsupervised MRI segmentation.
- Supervisors: Prof. Dr.-Ing. Gerold Bausch, Dr. Patrick Scheibe, Kornelius Podranski.

2014 – 2018 **B.Eng., Electrical Engineering & Information Technology** — HTWK Leipzig

Final grade 1.8 (German scale). Cooperative degree with Siemens (integrated vocational training).

Research Experience

2021 – 2022 **Doctoral Research Stay** — University of Tübingen

Human and Machine Cognition Lab.

- Studied reusable environment representations in human reinforcement learning.
- Collaborators: Charley Wu, Philipp Schwartenbeck, Peter Dayan.

2019 – 2021 **Research Assistant** — MPI for Human Cognitive and Brain Sciences, Leipzig

- Built realistic simulations of high-resolution 3D MRI acquisitions to augment training data for deep-learning segmentation models.

Industry Experience

2022 **AI Engineer** — Appsfactory GmbH, Leipzig

- Led a data-engineering project for the *Frankfurter Allgemeine Zeitung* and an ML project for the Saxony State Police (speaker diarization; a recommender for correcting automatic transcriptions).

2018 – 2019 **Embedded Software Engineer** — SENEC, Leipzig

- Controller software for smart solar-battery systems. Led two projects: a hardware-in-the-loop integration test suite and a communication interface to an external EV charger.

Teaching

present — **Teaching Assistant, Advanced Deep Learning** — Universität Leipzig
Gave lectures for master's students; deep reinforcement learning and deep latent variable model lectures.

2020 – 2021 — **Teaching Assistant, Systems Theory** — HTWK Leipzig
Planned and led tutorials for third-semester students; final-exam preparation.

Awards

2021 — Master's Thesis Award — *Förderpreis für angewandte Digitalisierung*.

Skills

Programming — Python (scientific computing, deep learning), C/C++ (mostly embedded).

Methods — Deep reinforcement learning, information geometry, constrained optimization, scientific computing, medical image analysis.

Languages — English (fluent), German (fluent), Serbian (fluent).