

Firas Al-Hafez

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EDUCATION

Ph.D.

Technische Universität Darmstadt, Germany

since November 2021

Computer Science, Researching in Machine Learning for Robotics at the **Intelligent Autonomous Systems Lab**

Supervisor: Jan Peters

Key Interests: Reinforcement Learning, Inverse Reinforcement Learning, Autoregressive Models for RL, Humanoid Robotics

Master of Science

Technische Universität Braunschweig, Germany

October 2017 – April 2021

Electronic Systems

Thesis: *Inductive biases for reinforcement learning and evolution strategies in robotic manipulation*

Master of Science

Technische Universität Braunschweig, Germany

April 2017 – December 2019

Mechanical Engineering

Thesis: *Reinforcement learning for tactical maneuver planning for automated driving*

Bachelor of Science

Technische Universität Braunschweig, Germany

October 2013 – May 2017

Industrial and Mechanical Engineering

Thesis: *Investigation of the holistic energy demand of different power trains under boundary conditions*

EXPERIENCE

Institute of Robotics and Process Control

August 2020 - April 2021

Graduate Researcher under the supervision of **Jochen Steil**

Braunschweig, Germany

- Developed reinforcement learning policies with nullspace control for robotic manipulation, enabling zero-shot transfer from simulation to real-world on the Franka Emika Panda robot, improving safety and applicability. (led to **CoRL Paper**)

Volkswagen Group

October 2018 - December 2019

Research Intern, Machine Learning

Wolfsburg, Germany

- Developed a tactical maneuver planner using DQN and MCTS, benchmarked against dynamic programming and sampling-based approaches, within a self-developed modular simulation environment for urban maneuver planning, integrating OpenDRIVE road networks. (resulting in patent **US20210263526A1**)

Daimler Group

September 2016 - April 2017

Simulation Engineering Intern

Stuttgart, Germany

- Conducted thermodynamic energy analysis and simulation for hybrid drivetrain topologies.

HIGHLIGHTED PUBLICATIONS

F. Al-Hafez and G. Zhao and J. Peters and D. Tateo. *Time-Efficient Reinforcement Learning with Stochastic Stateful Policies*. Presented at the International Conference on Learning Representations (**ICLR**), Vienna Austria, May 2024. [[paper](#)]

F. Al-Hafez and G. Zhao and J. Peters and D. Tateo. *LocoMuJoCo: A Comprehensive Imitation Learning Benchmark for Locomotion*. Presented at the Robot Learning Workshop in Conference on Neural Information Processing Systems (**NeurIPS**), New Orleans United States, December 2023. [[paper](#)] and [[code](#)]

F. Al-Hafez and D. Tateo and O. Arenz and G. Zhao and J. Peters. *LS-IQ: Implicit Reward Regularization for Inverse Reinforcement Learning*. Presented at the International Conference on Learning Representations (**ICLR**), Kigali Rwanda, May 2023. [[paper](#)] and [[code](#)]

F. Al-Hafez and J. Steil. *Redundancy Resolution as Action Bias in Policy Search for Robotic Manipulation*. Presented at the Conference on Robot Learning (**CoRL**), London UK, November 2021. [[paper](#)] and [[project website](#)]

PATENTS

M. Helbig, J. Hoedt, and **F. Al-Hafez**. *Method and Device for Supporting Maneuver Planning for an Automated Driving Vehicle or a Robot*. 2020. Patent No.: **US20210263526A1**

AWARDS

Outstanding Presentation Award at NeurIPS ROL Workshop

December 2023

Won for my paper [LocoMuJoCo: A Comprehensive Imitation Learning Benchmark for Locomotion](#) at the Robot Learning Workshop at NeurIPS.

Robotic Talents Award 2021 [\[read more\]](#)

December 2021

Granted by the German Ministry of Economic Affairs, Labour, and Digitalization

- Received for the best Master's thesis in the field of robotics in the State of Lower Saxony, Germany.

INVITED TALKS

Conference on Robot Learning, [LocoLearn Workshop](#)

November 2024

"*Learning Robust Whole-Body Control from Human Motion Capture.*"

Munich, Germany

TU Vienna, Group of Prof. [Dongheui Lee](#) and Prof. [Christian Ott](#)

May 2024

"*Towards Learning Whole-body Humanoid Control.*"

Vienna, Austria

Max Planck Institute for Intelligent Systems, Group of Prof. [Georg Martius](#)

November 2023

"*Towards Learning Natural Locomotion.*"

Tübingen, Germany

ORGANIZED WORKSHOPS

Next-Gen Robot Learning Symposium

November 2024

Co-organizers: Jan Peters, Georgia Chalvatzaki

Darmstadt, Germany

Speakers: Vikash Kumar, Oliver Kroemer, Nima Fazeli, Yunzhu Li, Kiana Ehsani

TEACHING

Teaching Assistant

Lecture: [Probabilistic Methods in Computer Science](#)

since May 2024

Intelligent Autonomous Systems @ TU Darmstadt – Lecturer: [Prof. Jan Peters](#)

- Preparation of new lecture slides and course organization

Teaching Assistant

Lecture: [Robot Learning](#)

September 2023 - September 2024

Intelligent Autonomous Systems @ TU Darmstadt – Lecturer: [Prof. Jan Peters](#)

- Lead teaching assistant managing the lecture and exercise

Teaching Assistant

Lecture: [Computational Engineering and Robotics](#)

April 2022 – March 2023

Intelligent Autonomous Systems @ TU Darmstadt – Lecturer: [Prof. Jan Peters](#)

- Assisting the lecture and exercises

Teaching Assistant

Lecture: [Introduction to Machine Learning](#)

April 2020 – August 2020

Institute of Robotics and Process Control @ TU Braunschweig – Lecturer: [Prof. Jochen Steil](#)

- Assisting the lecture and exercises

ACADEMIC SERVICE

Reviewed for NeurIPS, ICLR, RLC, AISTATS, CoRL, RSS, ICRA, IROS.

ACADEMIC SUPERVISION

<i>M.Sc. Thesis</i>	Henri-Jacques Geiß	Inverse Reinforcement Learning for Musculoskeletal Control of Humanoids (resulted in paper at Humanoids Conference 2024)
<i>Seminar</i>	Oleg Kaidanov & Yusuf Suvairi	Study on Diffusion Policies for Whole-body Humanoid Control (resulted in paper at CoRL Conference Workshop 2024)
<i>B.Sc. Thesis</i>	Tim Althaus	Inverse Reinforcement Learning from Observation on the Unitree A1 Robot

COMPETENCIES

Software Engineering (Python, C++, Git), Machine Learning (JAX, PyTorch, TensorFlow), Robotics (Mujoco, ROS), Design (Blender, DaVinci Resolve, Inkscape)