Lukas **Hermann**

Computer Science · Machine Learning · Robotics

Berlin, Germany

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Education

M.Sc. in Computer Science (GPA 4.0)

Freiburg, Germany

Albert Ludwig University of Freiburg — *Oct. 2015 - Jun. 2019*

- Minor: Cognitive Science
- Specialization: Machine Learning, Computer Vision, Robotics, Data Science
- Thesis: Adaptive Curriculum Generation from Demonstrations (advised by Prof. Dr. Wolfram Burgard)
- Erasmus semester at Sapienza University of Rome, Italy

B.Sc. in Computer Science (GPA 3.8)

Freiburg, Germany

Albert Ludwig University of Freiburg — *Oct. 2011 - Sep. 2015*

- Minor: Cognitive Science
- Thesis: Hand Orientation Estimation using Deep Neural Networks (advised by Prof. Dr. Wolfram Burgard)
- Erasmus semester at Eötvös Loránd University Budapest, Hungary

Abitur (GPA 3.8)

Stuttgart, Germany

Eduard-Mörike Gymnasium Stuttgart — *Sep. 2001 - Jul. 2010*

- Intensive courses: German, Mathematics, Chemistry, English, Spanish

Experience

Machine Learning & Cheminformatics Intern

Berlin, Germany

Pangea Bio — *Feb. 2023 - Feb. 2024*

- Fine-tuning and prompt engineering of LLMs for medical entity and relationship extraction from ethnobotanical literature.
- Benchmarking machine learning models and molecular fingerprints for chemical activity prediction.

PhD Candidate

Freiburg, Germany

Autonomous Intelligent Systems Lab, University of Freiburg — *Feb. 2020 - Apr. 2022*

- Researched machine learning for robot manipulation.
- Created a benchmark, dataset and state-of-the-art architecture for learning language-conditioned robot control policies from unstructured data.
- Developed a Python framework for the fast design of platform-independent robot experiments.
- Implemented robot control on three different robots (KUKA iiwa, Franka Emika Panda, UR3).
- Optimized distributed training on high-performance SLURM cluster.
- Student supervision.

Research Assistant

Freiburg, Germany

Autonomous Intelligent Systems Lab, University of Freiburg — *Sep. 2019 - Jan. 2020*

- Design and implementation of deep reinforcement learning algorithms for real-world robot manipulation with KUKA iiwa.

Student Research Assistant

Freiburg, Germany

Autonomous Intelligent Systems Lab, University of Freiburg — *Jun. 2016 - Aug. 2016*

- 3d reconstruction of everyday objects for robot manipulation (for tracking and training in simulation).

Student Research Assistant

Freiburg, Germany

Autonomous Intelligent Systems Lab, University of Freiburg — *Sep. 2015 - Nov. 2015*

- Trained a mouth detection system for robotics applications.

Skills

Programming	Python, C++, Java, Bash
Frameworks	NumPy, PyTorch, SciPy, Scikit-learn, Pytorch Lightning, Pandas, Huggingface, ROS, PyBullet, OpenCV, RDKit
Miscellaneous	Linux, Docker, AWS, SLurm, Latex
Languages	German (native), English (highly proficient), Spanish (fluent), Italian (good command)

Publications

- What Matters in Language Conditioned Robotic Imitation Learning over Unstructured Data
  Oier Mees*, **Lukas Hermann***, Wolfram Burgard
  Proceedings of the International Conference on Intelligent Robots and Systems (IROS), 2022, Kyoto, Japan
- CALVIN: A Benchmark for Language-Conditioned Policy Learning for Long-Horizon Robot Manipulation Tasks
  Oier Mees*, **Lukas Hermann***, Erick Rosete-Beas, Wolfram Burgard
  IEEE Robotics and Automation Letters (RA-L), vol. 7, n. 3, pp. 7327-7334, 2022
- Affordance Learning from Play for Sample-Efficient Policy Learning
  Jessica Borja-Diaz*, Oier Mees*, Gabriel Kalweit, **Lukas Hermann**, Joschka Boedecker, Wolfram Burgard
  Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2022, Philadelphia, USA
- FlowControl: Optical Flow Based Visual Servoing
  Maximilian Argus, **Lukas Hermann**, Jon Long, Thomas Brox
  Proceedings of the International Conference on Intelligent Robots and Systems (IROS), 2020, Las Vegas, USA
- Hindsight for Foresight: Unsupervised Structured Dynamics Models from Physical Interaction
  Iman Nematollahi, Oier Mees, **Lukas Hermann**, Wolfram Burgard
  Proceedings of the International Conference on Intelligent Robots and Systems (IROS), 2020, Las Vegas, USA
- Adaptive Curriculum Generation from Demonstrations for Sim-To-Real Visuomotor Control
  Lukas Hermann*, Maximilian Argus*, Andreas Eitel, Artemij Amiranashvili, Wolfram Burgard, Thomas Brox
  Proceedings of the International Conference on Robotics and Automation (ICRA), 2020, Paris, France

Awards

2023 **IEEE Robotics and Automation Letters Best Paper Award**, CALVIN *London, UK*

Software & Datasets

CALVIN

GITHUB.COM/MEES/CALVIN

- Open-source simulated benchmark for learning long-horizon language-conditioned tasks.
- 24 hours of teleoperated robot environment interaction with 20K language instructions.
- Multi-context imitation learning baselines.

HULC

GITHUB.COM/LUKASHERMANN/HULC

- State-of-the-art model that can learn a wide variety of language-conditioned robot skills from offline free-form imitation datasets.

Student Supervision

2021 **Ilia Dobrusin**, Self-Supervised Consistency Loss for Sim-to-Real Domain Adaptation *Master Thesis*
2021 **Mikel Martinez**, Self-supervised Control with Vision and Language *Master Project*
2021 **Jessica Borja**, Affordance Learning from Play for Sample-Efficient Policy Learning *Master Project*
2021 **Group Project**, Object Grasping on Point Clouds *Deep Learning Lab*

Extracurricular Activity

Voluntary social year

Jinotepe, Nicaragua

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) *Aug. 2010 - Aug. 2011*

- Organized activities for schoolchildren in a local library.
- Accompanied a local NGO's environmental education program in rural communities.

References

Wolfram Burgard Professor at University of Technology Nuremberg, wolfram.burgard@utn.de, relation: supervisor MSc/PhD
Oier Mees PostDoc at UC Berkeley, oier.mees@eecs.berkeley.edu, relation: PhD colleague
Andreas Bender Pangea Bio / Professor at University of Cambridge, andreas@pangeabio.com, relation: supervisor internship