Lukas **Hermann**

COMPUTER SCIENCE · MACHINE LEARNING · ROBOTICS

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| 🎓 Google Scholar

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

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, Tensorflow, ROS, PyBullet, OpenCV, Hydra
Miscellaneous	Linux, Git, Latex, Slurm
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

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.

Mentor for international students
Freiburg, Germany
ERASMUS STUDENT NETWORK   *Oct. 2017 - Dec. 2018*
- Organized social events for international students.