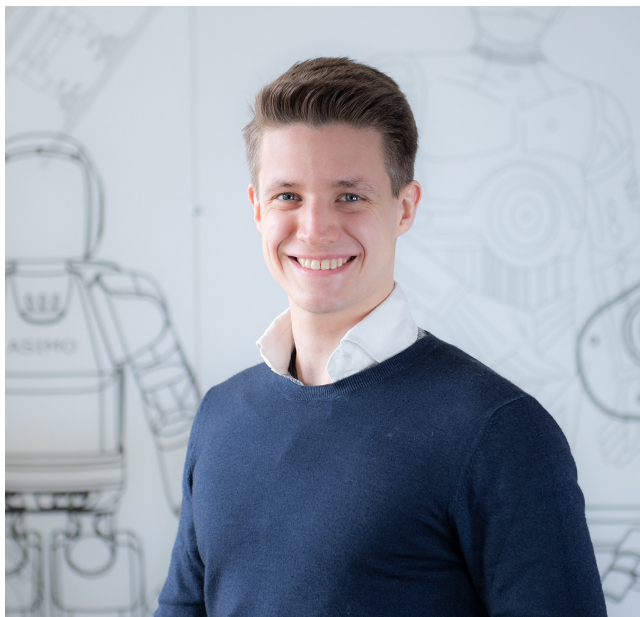# Curriculum Vitae

Dr. Lukas Schmid

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Research Interests

I'm passionate about autonomy for intelligent mobile systems. In particular, my work focuses on active and passive perception and understanding of changing environments for robotic interaction and augmented reality. This includes building dense geometric and semantic representations of an environment, scene abstraction and understanding, lifelong learning and mapping, as well as active path and interaction planning to build these representations and abstractions autonomously and in unknown environments.

Education

7.2019-10.2022	**Dr. Sc. with Autonomous Systems Lab (ASL) at ETH Zürich**
	◦ Thesis: Robust Active Perception and Volumetric Mapping in Unknown Changing Environments. Cumulative thesis of 6 first-authored papers.
	◦ Supervised by Prof. Roland Siegwart, Cesar Cadena, and Juan Nieto, in collaboration with Prof. Marc Pollefeys, Jeffrey Delmerico, Johannes Schönberger, and Helen Oleynikova at Microsoft.
9.2017-6.2019	**M. Sc. Robotics, Systems and Control (RSC) at ETH Zürich**
	◦ Graduated with Distinction.
	◦ Awarded the Willi Studer Prize for the best graduate in M. Sc. RSC.
	◦ Awarded the ETH Medal for outstanding Master Theses.
9.2013-9.2016	**B. Sc. Mechanical Engineering at ETH Zürich**
9.2013-9.2016	**Grammar School in Frauenfeld**
	◦ Graduated with Distinction.
	◦ Honored with the Outstanding Matura Thesis Award.

Employment

2.2023-current	**Postdoctoral Fellow**, MIT, Cambridge, MA.
	○ Working with Prof. Luca Carlone at the MIT-SPARK Lab on higher-level scene understanding and dynamic 3D scene graphs.
10.2022-1.2023	**Postdoctoral Researcher**, ETH Zürich.
	○ Working with Prof. Roland Siegwart at the Autonomous Systems Lab.
11.2021-2.2022	**Research Exchange** at Microsoft Mixed Reality and AI Lab, Zürich.
	○ Working with Prof. Marc Pollefeys, Juan Nieto, Jeffrey Delmerico, and Johannes Schönberger on Panoptic Multi-TSDFs and Active Perception in Changing Scenes.
	○ Proposed and started two joint Master Theses, one on Incremental 3D Scene Graph Generation and one on Active Perception for Visual Long-term Re-localization.
9.2018-2.2019	**Teaching Assistant** at ETH Zürich, with Prof. Joachim Buhmann, D-INFK.
2.2017-6.2017	**Maintenance Engineer** at BOSCH, sia Abrasives Industries AG, 8500 Frauenfeld.
9.2016-2.2017	**Engineering Intern** at BOSCH, sia Abrasives Industries AG, 8500 Frauenfeld, Department of Technical Functions.
1.2014-2.2014	**Workshop Intern**, at Phoenix Mechano, 8260 Stein am Rhein.

Awards

2020	Willi Studer Prize for the best graduate in M.Sc. RSC at ETH Zürich.
2020	ETH Medal for outstanding master thesis.
2013	Grammar School Frauenfeld Award for excellent graduates.
2013	Grammar School Frauenfeld Award for outstanding matura thesis.

Awarded Grants

2022	Swiss National Science Foundations (SNSF) Postdoc.Mobility Grant.

Invited Talks

12.2022	"Robust Active Perception and Volumetric Mapping in Unknown Changing Environments", presented at the *Joint Control and Robotics Seminar*, University of Manchester.
4.2022	"Semantics and Learning for Robust Active Perception in Changing Environments", presented at the Google *Semantic Perception Reading Group*.

Teaching

2019-current	**Supervised 40+ students in projects.** ○ Supervised 30+ student theses (Master-, Semester-, or Bachelor Thesis). ○ Supervised 10 students in projects (Perception and Learning for Robotics).
2018-current	**Teaching Assistant in Courses.** Topic selection, preparation, and teaching of exercise sessions. Q&A Sessions. Question preparation, verification, supervision, and correction of exams. ○ M.Sc. Course "Autonomous Mobile Robots" (2020, 2021, 2022) ○ M.Sc. Course "Perception and Learning for Robotics" (2020, 2021, 2022) ○ M.Sc. Course "Advanced Machine Learning" (2018)
2008-2015	**Supervised 10+ students in private mathematics and physics classes.** ○ Middle school, grammar school, and adult qualification to university entrance (TSME) students. ○ Admission or final exam preparations (with 100% success rate).
2021-current	**Representative of PhDs and Postdocs in the Teaching Commission of the Department of Mechanical and Process Engineering at ETHZ.**
2022-current	**Member of the working group to restructure curriculum of B.Sc. Mechanical Engineering at ETHZ.**
2018-current	**Didactic Education** ○ Didactics for Teaching Assistants, 1 week training at ETH Zürich, 2018. ○ Power and Leadership, 6 month course at ETH Zürich, 2022. ○ Selection Procedures and Bias, workshop at ETH Zürich, 2022.

Engagements

2020-current	**Reviewer for Journals, Conferences, and Workshops.** ○ IEEE Transaction on Robotics (T-RO) - 2022 ○ Autonomous Robots - 2023 ○ Pattern Recognition - 2022 ○ IEEE Robotics and Automation Letters (RA-L) - 2020, 2021, 2022 ○ IEEE/CAA Journal of Automatica Sinica - 2022 ○ Robotics: Science and Systems (RSS) - 2023 ○ IEEE Int. Conf. on Robotics and Automation (ICRA) - 2021, 2022 ○ IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS) - 2021, 2022 ○ Conf. on Neural Information Processing Systems (NeurIPS) - 2021
2.2020-2.2022	**Member of Board, Association of Scientific Staff of the Department of Mechanical and Process Engineering (AV-MAVT), ETH Zürich.** ○ Representative of PhDs and postdocs in the department conference. ○ Representative of PhDs and postdocs in the dept. teaching commission. ○ Representative of PhDs and postdocs in the working group restructuring the curriculum of B.Sc. Mechanical Engineering at ETHZ.

6.2018-6.2022	**Member of Board, Student Wine Association Zürich (SWAZ).**
	◦ Joint association of ETHZ and University Zürich.
	◦ Collaboration with industry partners (Landolt, Zweifel, Baur au Lac, Mövenpick, Smith&Smith, Rare Wines Zürich, Provins, and others).
2019-current	**IEEE Robotics and Automation Society (RAS), Graduate Student Member.**

Languages

German	Mother Tongue. Also includes Swiss German.
English	Fluent. Level C2, Cambridge Certificate in Advanced English (CAE), Grade A, 2013. 5+ years of study and work in English.
French	Conversant. Level B2, Diplôme d'Études en Langue Française (DELF), 2012.

Skills

Programming	C++, Python, LaTex, C#, Matlab, and VisualBasic.
Open-source	I am a strong proponent of open-source code and make most of my projects publicly available. A selection of code-bases is given below: `https://github.com/ethz-asl/panoptic_mapping`, `https://github.com/ethz-asl/mav_active_3d_planning`, `https://github.com/ethz-asl/glocal_exploration`, `https://github.com/ethz-asl/unreal_airsim`, `https://github.com/ethz-asl/config_utilities`
Simulation	Unreal Engine 4, AirSim, Unity, Gazebo, CoppeliaSim, Siemens NX CAD, and COMSOL Multiphysics FEM.
Robotics	ROS, Matlab, and Simulink.
UAVs	BAZL/EASA UAV Operator License Categories A1/A3.
Deep Learning	PyTorch, Tensorflow, Keras, and SciKit Learn.
IT	Maintained websites and newsletters for multiple associations.

Interests

Besides my work, I am a passionate classical pianist (four times winner of the 1st prize at the Thurgauer Youth Music Competition, 3 times with award). Furthermore, I enjoy team sports such as volleyball, especially beach volleyball during summer. I love exploring, tasting, and presenting wines (WSET Level 2 Award in Wines, passed with distinction) and sharing these experiences with others. For recreation, I relish various water sports such as scuba diving (PADI Advanced Open Water Diver), sailing (Swiss Yachting Certificate) as well as wave, wake, and wind surfing.