|  |  |  |
| --- | --- | --- |
|  | Sebastian Koch *Doctoral Researcher (3rd year)* |  |
| [koch.sebastian@mail.com](mailto:koch.sebastian@mail.com) | <https://kochsebastian.com> | Stuttgart, Germany |

|  |
| --- |
| **Education** |

|  |  |
| --- | --- |
| 2022 – 2026 | **Ulm University, Germany** |
|  | PhD in Computer Science |
|  | * *Advisor*: [Prof. Timo Ropinski](https://viscom.uni-ulm.de/members/timo-ropinski/) * *Thesis*: Open-Vocabulary 3D Scene Understanding and Reasoning with 3D Scene Graphs * *Apr 2022 – Apr 2025*: Bosch Research Doctoral Program * *May 2025 – Nov 2025*: Google Student Researcher |

|  |  |
| --- | --- |
| 2020 – 2022 | **Tübingen University, Germany** |
|  | Master of Science in Computer Science |
|  | * *Advisors*: Prof. [Gerhard Neumann](https://alr.anthropomatik.kit.edu/21_65.php) & [Prof. Andreas Geiger](https://www.cvlibs.net/) * *Thesis project*: Multi-View RGB-D Fusion for 6D Pose Estimation * *GPA*: 1.4 (1.0 is the best) * *Selected courses*: Computer Vision, Deep Learning, Reinforcement Learning, Mobile Robotics, Mathematics for Machine Learning, 3D Computer Vision |

|  |  |
| --- | --- |
| 2016 – 2020 | **Baden-Württemberg Cooperative State University (DHBW), Germany** |
|  | Bachelor of Engineering in Computer Science |
|  | * *Thesis project*: Improvement of the robustness of a SLAM system using Object Semantics * *GPA*: 1.8 (1.0 is the best) |

|  |
| --- |
| **Experience** |

|  |  |
| --- | --- |
| **Google Research** | |
| May 2025 – Nov 2025 | Student Researcher – 3D Scene Understanding for AR/VR Applications | |
| * Advisors: [Johanna Wald](https://scholar.google.de/citations?user=dfjN3YAAAAAJ&hl=en) & [Federico Tombari](https://federicotombari.github.io/) * *Role*: Research on open-vocabulary 3D scene understanding for augmented reality solutions. | |

|  |  |
| --- | --- |
| **Bosch Center for Artificial Intelligence** | |
| Apr 2022 – Apr 2025 | Bosch Research Doctoral Program – 3D Scene Understanding for indoor Robotic Applications | |
| * Advisors: [Narunas Vaskevicius](https://scholar.google.com/citations?user=U3KSTwkAAAAJ&hl=en) & [Mirco Colosi](https://scholar.google.com/citations?user=k4m1c6EAAAAJ&hl=en&oi=ao) * *Role*: Research and development on 3D Scene Graphs for indoor 3D scene understanding, achieving over 50% reduction in labeled sample requirements through self-supervised learning, and introducing open-vocabulary relationship predictions for fine-grained inter-object reasoning. This work resulted in four first-author publications [1], [3], [4], [5]. | |
| Oct 2021 – Mar 2022 | Industrial Master Thesis – 6D Pose Estimation | |
| * *Advisor*: [Fabian Duffhauss](https://scholar.google.com/citations?user=efxPCRAAAAAJ&hl=en&oi=ao) * *Role*: Developed a multi-view RGB-D fusion method with a symmetry-aware keypoint voting approach, improving 6D Pose Estimation accuracy by 7.6% and achieving state-of-the-art results, resulting in a publication [6]. | |

|  |  |
| --- | --- |
| **University of Tübingen** | |
| Sep 2020 – Oct 2021 | Research Assistant – Real-time high-resolution remote sensing | |
| * *Advisors*: [Leon-Amadeus Varga](https://scholar.google.com/citations?hl=en&user=4XOjpZ8AAAAJ&view_op=list_works) & [Prof. Andreas Zell](https://uni-tuebingen.de/fakultaeten/mathematisch-naturwissenschaftliche-fakultaet/fachbereiche/informatik/lehrstuehle/kognitive-systeme/the-chair/staff/prof-dr-andreas-zell/) * *Role*: Research on encoder-only region proposal techniques combined with hardware-optimized TensorRT and CUDA implementations on embedded GPUs for real-time object detection in high-resolution images. Studied the impact of on-device image pre-processing for enhanced remote sensing object detection accuracy, resulting in a publication [7]. | |

|  |  |
| --- | --- |
| **Bosch Research** | |
| Apr 2020 – Oct 2020 | Research Intern – Object-level Semantics for SLAM | |
| * *Advisor*: [Stefan Benz](https://www.linkedin.com/in/stefan-benz-95940b154/?originalSubdomain=de) * *Role*: Integrated an object detection pipeline into a ROS system for enhanced localization and mapping. Led synthetic data generation using Unreal Engine to enable reproducible mapping runs used in the evaluation section of a published paper. | |

|  |  |
| --- | --- |
| **Bosch Group** | |
| Oct 2016 – Mar 2020 | Industrial Bachelor Student | |
| * *Role*: Alongside my bachelor’s in computer science at the university, I worked on scientific projects in different departments at Bosch, applying learned knowledge and collaborating with experienced developers and researchers. * *Mentors*: Stefan Benz, Hanna Ziesche, Christopher Baker, Stephan Stühmer * *Nov 2017 – Feb 2018*: Analyzed false-positive ultrasonic reflections in automotive sensors. * *Jun 2018 – Sep 2018*: Implemented a play-back recording feature for ECU failure analysis. * *Jun 2019 – Sep 2019*: Implemented a pedestrian simulator for ML-based human behavior prediction. * *Sep 2019 – Mar 2020*: Researched the impact of semantic features for improved SLAM accuracy. | |
| **Honors & Awards** | | |

|  |  |
| --- | --- |
| 2024 | Accepted into International Computer Vision Summer School (ICVSS) 2024 for excellent PhDs in CV. |

|  |  |
| --- | --- |
| 2021 | 1st place in the AI Chess Variant Competition conducted by the Cognitive Systems Lab of Prof. Andreas Zell. |
|  | 3rd place in the RL Hockey Competition of the MPI Autonomous Learning Group of Prof. Georg Martius. |

|  |  |
| --- | --- |
| 2020 | Accepted into the Students@Bosch program for students who excelled at Bosch internships. |

|  |  |
| --- | --- |
| 2014 | 4th place at the RoboCup World Cup 2014 in Joao Pessoa Brazil in the Rescue Junior competition |

|  |  |
| --- | --- |
| 2013 | German Champion at the RoboCup German Open 2013 in the Rescue Junior competition.  World Champion at the RoboCup World Cup 2013 in Eindhoven in the Rescue Junior competition. |
| **Publications** | | |

For a complete list of all publications, including recent pre-preprints see: [*kochsebastian.com/publications*](http://kochsebastian.com/publications)

|  |  |
| --- | --- |
| 2025 | [1] **S Koch**, J Wald, M Colosi, N Vaskevicius, P Hermosilla, F Tombari, T Ropinski, *“RelationField: Relate Anything in Radiance Fields”,* in Conference on Computer Vision and Pattern Recognition (**CVPR**), 2025.  [2] Y Liu, L Palmieri, **S Koch**, I Georgievski, M Aiello, *“DELTA: Decomposed Efficient Long-Term Robot Task Planning using Large Language Models”*, in IEEE International Conference on Robotics and Automation **(ICRA)**, 2025. |

|  |  |
| --- | --- |
| 2024 | [3] **S Koch**, N Vaskevicius, M Colosi, P Hermosilla, T Ropinski, *“Open3DSG: Open-vocabulary 3D Scene Graphs from Point Clouds with Queryable Objects and Open-Set Relationships”,* in Conference on Computer Vision and Pattern Recognition (**CVPR**), 2024.  [4] **S Koch**, P Hermosilla, N Vaskevicius, M Colosi, T Ropinski, *“Lang3DSG: Language-based contrastive pre-training for 3D Scene Graph prediction”*, in International Conference on 3D Vision (**3DV**), 2024.  [5] **S Koch**, P Hermosilla, N Vaskevicius, M Colosi, T Ropinski, *“SGRec3D: Self-Supervised 3D Scene Graph Learning via Object-Level Scene Reconstruction”,* in Winter Conference on Applications of Computer Vision (**WACV**), 2024. |

|  |  |
| --- | --- |
| 2023 | [6] F Duffhauss, **S Koch**, H Ziesche, NA Vien, G Neumann, *“SyMFM6D: Symmetry-aware Multi-directional Fusion for Multi-View 6D Object Pose Estimation”,* in Robotics and Automation Letters (**RA-L**), 2023. |

|  |  |
| --- | --- |
| 2022 | [7] LA Varga, **S Koch**, A Zell, *“Comprehensive Analysis of the Object Detection Pipeline on UAVs”*, in **Remote Sensing**, 2022. |

|  |
| --- |
| **Invited Talks** |

|  |  |
| --- | --- |
| 2025 | **Huawai Munich Research Center**: *Language-driven Scene Understanding with 3D Scene Graphs*,  Munich 06.02.2025. |

**Languages:** German (native), English (fluent)

|  |  |
| --- | --- |
| 2024 | **RWTH Aachen. Computer Vision Group, Prof. Bastian Leibe**: *3D Scene Understanding with label-efficient and open-vocabulary 3D Scene Graphs*, Remote 27.02.2024.  **Bosch Research US, Sunnyvale.** *3D Scene Understanding with label-efficient and open-vocabulary 3D Scene Graphs*, Remote 07.02.2024 |
| |  | | --- | | **Service** |   **Reviewing**: CVPR 2024–2025, ICCV 2023–2025, ICRA 2025, NeurIPS 2024, IROS 2024–2025 **Volunteering**: I work as a volunteer and referee at RoboCup Junior events on a national and international level.     |  | | --- | | **Qualifications** |   **Programming**: Python, C++, MATLAB, Bash **Libraries**: PyTorch, Lightning, JAX, NumPy, Matplotlib, Open3D, OpenCV, TensorRT **Software**: Git, LATEX, ROS, GNU/Linux, Office **Languages:** German (native), English (fluent)    **References** | | |

|  |  |
| --- | --- |
| **Prof. Timo Ropinski.** Full Professor, Ulm University. | [timo.ropinski@uni-ulm.de](mailto:timo.ropinski@uni-ulm.de) |
| **Dr. Federico Tombari.** Director of Research, Google Zurich. | [tombari@google.com](mailto:tombari@google.com) |
| **Prof. Pedro Hermosilla.** Assistant Professor, TU Wien. | [phermosilla@cvl.tuwien.ac.at](mailto:phermosilla@cvl.tuwien.ac.at) |
| **Dr. Narunas Vaskevicius.** Lead Research Scientist, Bosch Research. | [narunas.vaskevicius@bosch.com](mailto:narunas.vaskevicius@bosch.com) |
| **Prof. Gerard Pons-Moll.** Full Professor, University of Tuebingen. | [gerard.pons-moll@uni-tuebingen.de](mailto:gerard.pons-moll@uni-tuebingen.de) |