SEBASTIAN KOCH

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PhD Candidate

Bosch Corporate Research, University of Ulm

EDUCATION

PhD — **Computer Science,** *University of Ulm, Ulm Germany*

Apr 2022 – present — PhD topic: 'Machine Learning for 3D Scene Understanding', collaboration with Bosch Research

M. Sc. — **Computer Science**, *University of Tübingen, Tübingen Germany*

Apr 2020 – Mar 2022 — Computer Science Major with focus on machine learning, computer vision and robotics
Master-Thesis: 'Multi-View RGB-D Fusion for 6D Pose Estimation'
GPA: *1.5 (1.0 is the best)*

B. Eng. — **Computer Science**, *Baden-Württemberg Cooperative State University, Stuttgart Germany*

Oct 2016 - Mar 2020 — Computer Science Major with additional automotive orientated courses
Bachelor-Thesis: 'Improvement of the robustness of a SLAM system with Computer Vision'
Thesis grade: *1.1*, GPA: *1.8 (1.0 is the best)*

EXPERIENCE

BCAI — **Master-Thesis (6D Pose Estimation),** *Bosch Center for Artificial Intelligence, Tübingen*

Oct 2021 – Mar 2022
- Development of a novel Multi-View RGB-D fusion architecture for 6D Pose Estimation
- Focus on improvements in keypoint-voting and symmetry aware pose estimation

University of Tübingen — **Research Assistant (Embedded Object Detection),** *Cognitive Systems Lab, Tübingen*

Sep 2020 – Oct 2021
- Researched novel approaches for real-time *object detection* in very high-resolution images
- Optimizing state-of-the-art *deep learning* models for *object detection* with *CUDA* and *TensorRT* to achieve real time performance on embedded GPUs

Bosch Group — **Working Student (SLAM, Computer Vision & Simulation),** *Bosch Group (CR), Renningen*

Apr 2020 - Oct 2020
- Developed a face detection system with *YOLO* directly integrated into *ROS*
- Responsible for synthetic data generation with *AirSim* for 3D object detection with *computer vision*

Bosch Group — **Cooperative Study Program,** *Bosch Group, Stuttgart*

Oct 2016 - Mar 2020 — The Cooperative Study Program at Bosch provides the possibility to work on scientific projects in different departments at Bosch while pursuing ones Bachelor's degree

Oct 2019 - Jan 2020 — **Bachelor-Thesis (SLAM & Computer Vision),** *Bosch Group (CR), Renningen*
- Researched how to make an existing *SLAM* system more robust regarding environmental changes with semantic understanding of the environment like object detection and semantic segmentation
- Extracted semantic information using *classical computer vision* algorithms and *deep learning*
- Trained various object detectors with *Tensorflow* to benchmark them on a small custom dataset

May 2019 - Sep 2019 — **Intern (Pedestrian Behavior Simulation),** *Bosch Group (CC), Leonberg*
- Implemented a pedestrian simulation for behavior prediction with *machine learning*
- Used *PyTorch* for efficient simulation and integration in the *neural network* pipeline

May 2018 - Aug 2018 — **Intern Abroad (Hardware-in-the-Loop Simulation),** *Bosch Group (Bosch Eng.), Novi USA*
- Designed automated testing functionalities in *MATLAB* and *Simulink* for faster software testing

Nov 2017 - Mar 2018 — **Intern (Filter Algorithm Prototyping),** *Bosch Group (CC), Leonberg*
- Analyzed an interference problem of the new ultrasonic sensor system in the lab
- Used the conducted research to develop a filter algorithm for false-positive detections in *C++*

VOLUNTEERING

RoboCup Fed — Working as a volunteer at RoboCup Junior events (national and international)

Mar 2019 - present — Volunteers act as referees, supervisors and general helpers

HONORS & AWARDS

Bosch Group — Accepted into the Students@Bosch excellency program for students who excelled at previous Bosch internships. Guided by: Stefan Benz

Mar 2020 – Apr 2022

University of Tübingen — 1st place in the yearly AI Chess Variant Competition conducted by the Cognitive Systems Lab of Professor Zell (approx. 100 contestants)

Jan 2021

MPI-IS · Mar 2021 — 3rd place in the RL Hockey Competition of the Autonomous Learning Group (approx. 70 contestants)

RoboCup Fed — 1st place at the RoboCup World Cup 2013 in Eindhoven in the *Rescue* competition

2011 - 2014 — 4th place at the RoboCup World Cup 2014 in João Pessoa in the *Rescue* competition

SKILLS

German | Python | C/C++ | SLAM | Unix | Computer Vision

English | PyTorch | MATLAB | Robotics | ROS | Deep Learning