



EDUCATION

- M.Sc. - Computer Science, The University of Freiburg 04/2021 – 09/2023
 - **Courses:** Computer Vision, Mobile Robotics, Pattern Recognition, Deep Learning, Numerical Optimization, Numerical Optimal Control **Grade: 1.3**
 - **Master Project:** Compositional Servoing by Recombining Demonstrations (Paper, Website)
 - Performing **robot manipulation** tasks with minimum number of demonstrations
 - Enable skill sharing between different tasks by defining **demonstration trajectories**
 - **Master Thesis:** Radar Localization on Prior Lidar Maps (Paper, Website, Video)
 - **Cross-modal localization** using radar sensors for perception and lidar maps of the environment
 - Coarse-to-fine strategy – Global localization (without GPS) followed by metric localization
- B.E – Electronics and Communication, R. V. College of Engineering 08/2013 – 08/2017
 - **Courses:** Applied Mathematics, Digital Signal Processing, Digital Circuits **Grade: 8.97 / 10.0**
 - **Thesis:** Generation of Simulated Inputs to Image-based Advanced Driver Assistance Systems

PROFESSIONAL EXPERIENCE

- Student Assistant – Production Control Group, Fraunhofer IPM 09/2022 – 10/2023
 - Software development for the Freefall Inspection System
 - Machine Learning applications in the detection of anomalies in industrial parts
 - Configured a CIFX device with Profinet IO for real-time communication
 - Developed QT applications for better data visualization that helped improve product efficiency
- Teaching Assistant – Computer Graphics and Image Processing Course 04/2022 – 08/2022
 - Designed and conducted practical exercise sessions for a class of more than 50 students
- Research Intern – National Institute of Informatics, Japan 12/2021 – 04/2022
 - NII International Internship Program, 2021
 - **3rd rank** in the Drone-vs-Bird Detection Challenge
- Engineer – Mercedes-Benz Research & Development India 09/2017 – 04/2021
 - Developed algorithms for **lane localization** of the vehicle for a *Level-3 Automated driving project*
 - Conceptualized and developed algorithms for **fusion and tracking of static objects**
 - Automated **large-scale analysis** of test-drive data along with the creation of a dashboard
 - **Vehicle set up** with various sensors to collect data for a mapping research project
 - Generated a map in real time using state-of-the-art **SLAM** algorithms
 - Trained networks such as ERFNET to detect lane markings on the test-drive data

PUBLICATIONS

- **Nayak, A.**, Cattaneo, D., & Valada, A. (2023). RaLF: Flow-based Global and Metric Radar Localization in LiDAR Maps. arXiv preprint arXiv:2309.09875 (accepted at ICRA 2024)
- Argus, M., **Nayak, A.**, Büchner, M., Galessio, S., Valada, A., & Brox, T. (2023). Compositional Servoing by Recombining Demonstrations. arXiv preprint arXiv:2310.04271 (accepted at ICRA 2024)
- **Nayak, A.**, et al. Evaluation of Fully Convolutional One-Stage Object Detection for Drone Detection. International Conference on Image Analysis and Processing. Cham: Springer International Publishing, 2022
- L. Kenye, R. Palugulla, M. Arora, B. Bhat, R. Kala, and **A. Nayak**, Re-localization for Self-Driving Cars using Semantic Maps, 2020 Fourth IEEE International Conference on Robotic Computing (IRC)
- Patent: A System and Method for Lane-Determination of a Vehicle (published)
 - Using **sensor fusion** to define trajectories of dynamic objects (E.g., Neighboring vehicles)
 - Utilize these defined trajectories and the HD map to localize the vehicle on the road
 - Implementation is functional on series production **Mercedes-Benz S-Class 2021**

SKILLS

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|--------------------------------|------------------------|----------------------------|
| - C / C++ / Python Programming | - OpenCV | - Data Analysis |
| - Robot Operating System | - PyTorch / Tensorflow | - Deep Learning |
| - Apache Spark (PySpark) | - Geospatial Analysis | - Algorithm Design |
| - State Estimation | - SQL | - Object Tracking / Fusion |

HONOURS AND AWARDS

- 1st Place, Deep Learning Competition – Large Networks Track, University of Freiburg *03/2022*
- Inventor Trophy – Daimler AG *05/2019*
 - Appreciation for inventive achievements
- Bronze Star Award – Mercedes-Benz Research & Development India *12/2019*
 - Award for the best performer of the department