

ANWAR AHMAD QURAISHI

Computer Vision / SLAM Engineer | Robotics PhD

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KEY EXPERTISE

- Geometric Computer Vision
- Sensor Fusion / State Estimation / SLAM
- 3D reconstruction
- Object Detection / Segmentation
- Extensive C++ experience

EDUCATION

École Polytechnique Fédérale de Lausanne (EPFL)

- PhD in Robotics. 2016 - 2021
- Master of Science in Robotics. 2013 - 2015

Indian Institute of Technology, Hyderabad (IIT-H)

- Bachelor of Tech. In Mechanical Engineering with minor in Computer Science 2008 - 2012

TECHNICAL SKILLS

- **Programming / Scripting:** C/C++, Python, Matlab
- **Software / Libraries:** OpenCV, GTSAM, Ceres solver, Eigen, PyTorch, ROS, Git

WORK EXPERIENCE

Fixposition AG, Zurich, Switzerland

SLAM / Sensor Fusion Engineer

01/2022 - Present

- ▶ Developed and implemented state-of-the-art algorithms for real-time Visual-Inertial Odometry on embedded hardware, fusing Vision, IMU, GNSS and wheel encoders.
- ▶ Developed Robust keypoint / feature tracking algorithms.
- ▶ Lead development of Visual SLAM / Mapping pipeline for indoor localization.
- ▶ Segmentation as a pre-processing step for SLAM.
- ▶ Developed robust GNSS processing routine for accurate localization in degraded GNSS scenarios.
- ▶ Designed and evaluated various methods for online and offline calibration of extrinsics between various sensors – Camera, IMU, GNSS, and wheel encoder.

Distributed Intelligent Systems and Algorithms Lab, EPFL, Switzerland
PhD, Underwater Robotics

2016 - 2021

Thesis title: Cooperative Multi-Robot Systems for Aquatic Environmental Sensing

- ▶ Developed the localization pipeline for underwater robots, operating in harsh, information-sparse outdoor environments with and without GNSS.
- ▶ Used a combination of Extended Kalman Filter and a windowed optimization-based estimator for state estimation on a resource constrained embedded platform.
- ▶ Contributed to the development of hardware and firmware for underwater acoustic ranging and communication modules.
- ▶ Designed and developed algorithms for cooperative localization using acoustic ranging and communication within a group of underwater robots.
- ▶ Deployed robots in several Swiss lakes for autonomous water-quality monitoring missions in collaboration with lake biologists.

Polycom India (now Poly), Hyderabad, India
Software Engineer

2012 - 2013

- ▶ Worked on software for video-conferencing equipment.
- ▶ Received “Star Award” for best quarterly performance.

ADDITIONAL EXPERIENCE

Immersive VR for simulating Human-Robot interaction
Internship, Cyberbotics Ltd., Lausanne, Switzerland

08/2014 - 02/2015

- ▶ Development of a Virtual Reality interface for in-simulation human-robot interaction.
- ▶ Integration of Microsoft Kinect (for body pose detection) and Oculus Rift Virtual Reality headset.

Multi-Robot SLAM Project
Master thesis, Autonomous Systems Lab, ETH Zurich

03/2015 – 10/2015

- ▶ Worked on developing a system for fully distributed, scalable, concurrent multi-robot mapping.
- ▶ Handled intermittent connectivity losses and communication failures.

OTHER ACTIVITIES

Innosuisse Business Concept course

Attended high-gear course sponsored by Swiss innovation agency. Learnt how to identify technology ideas ripe for turning into practical products.

Co-founder and Coordinator, Robotics Club of IIT Hyderabad

Set up and maintained a club for hobby robotics projects, with active financial support from the university. Conducted lectures and workshops on elementary robotics, participated in robotics competitions and events.