

# MINGXUAN LIU

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## EDUCATION

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### KTH Royal Institute of Technology

*EIT Digital Master's programme in Autonomous Systems*

Sep. 2020 – Jun. 2022

Stockholm, Sweden

### Università di Trento

*EIT Digital Master's programme in Autonomous Systems, Average Mark: 29.25/30*

Sep. 2020 – Jun. 2022

Trento, Italy

### Beijing University of Civil Engineering and Architecture

*Bachelor of Engineering in Energy and Power Engineering*

Sep. 2013 – Jun. 2017

Beijing, China

## EXPERIENCE

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### Beijing Siemens Cerberus Electronics Co., Ltd.

*Innovation Engineer, Department of Innovation*

Jul. 2017 – Jul. 2020

Beijing, China

- Conducted innovative scenario research, market analysis and competitive product analysis in building automation industry
- Designed software and hardware solution for innovative scenarios and demonstrated the solution
- Defined features and functions for the innovative products based on the new use cases
- Cooperated with the internal R&D and production departments, third-party partners (OEM manufacturers, value-added partners, system integrators) to develop innovative products
- Managed the pilot project of the innovative products

## PROJECTS

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### Visual odometry research and implementation on AUV (ongoing) | *C++, SLAM*

Jul. 2021 – Present

- Conducting the visual odometry research for the AUV (Autonomous Underwater Vehicle) in SMaRC (Swedish Maritime Robotics Centre) lab.

### Steel manufacturing process optimization | *Python, PyTorch, OpenCV*

Jul. 2021 – Aug. 2021

- Deployed YOLOv5 Small deep learning model to complete the object detection, classification and tracking task for the hot and cold steel plates on the production line.
- Designed and implemented the PCA algorithm with image binarization to detect the rotation angle of the hot steel plates on the production line.

### Deep neural network design for person re-identification task | *Python, PyTorch, OpenCV*

Apr. 2021 – Jul. 2021

- Designed and trained a multi-task CNN with 12 classifiers with relation-aware attention module and ResNet-50 backbone to extract local attributes of and global structural information of the person image.
- Used the trained-model as feature extractor to re-identify the query image from the surveillance image gallery according to the similarity of the feature.

### Modeling and simulation of lightweight quadruped robot leg | *Maple*

Mar. 2021 – Jul. 2021

- Designed a three-segment quadruped robot leg with 2 degrees of freedom, 3 revolute joints, 2 RC servo motor as active actuators and 2 springs as passive actuators.
- Modeled and simulated the kinematics and dynamics of the leg in Maple.

### Comparison of feature descriptors for point cloud registration | *C++, PCL, Unity*

Oct. 2020 – Jan. 2021

- Developed a RGB-D camera and simulation scene in Unity to generate RGB point cloud data for the experiment.
- Developed point cloud registration pipelines with different feature descriptors (SI, PFH, FPFH, SHOT, CSHOT) and keypoint extraction algorithm (SIFT3D, ISS3D).

### IoT electric valve with NB-IoT communication | *NB-IoT*

Sep. 2019 – Jun. 2020

- Identified the new customer requirements of the district heating grid industry in China.
- Defined the features and functions of the electric valve with NB-IoT communication.
- Managed the R&D process of and pilot project of the IoT electric valve with NB-IoT communication.

### Small IoT PLC with ZigBee communication for small building automation | *ZigBee*

May 2018 – Jul. 2019

- Identified the customer requirements for wireless PLC and cloud platforms in building automation industry.
- Defined the features and functions of the small IoT PLC with ZigBee communication module.
- Designed the solution for the new use case in small commercial building automation.
- Managed the R&D process of and pilot project of the small IoT PLC.

## TECHNICAL SKILLS

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**Languages:** Python, C/C++, Maple, Unity, Ada

**Frameworks:** ORB-SLAM-3 (learning), PyTorch, Pandas, NumPy, OpenCV, PCL, G2O, Eigen, Ceres, Sophus