

Jie Yuan

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<https://penguinflys.github.io/penguinflys/about>

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EDUCATION

- **Leibniz University Hannover** Hanover, Germany
Master of Science in Navigation and Field Robotics (interdisciplinary); GPA: 3.3/4.0 Oct. 2017 – Feb. 2021
- **China University of Mining and Technology** Xuzhou, China
Bachelor of Engineering in geodesy and geoinformatics; GPA: 3.57/4.0 (6/157) Sept. 2013 – July. 2017

EXPERIENCE

- **Institute of Photogrammetry and Geoinformation at Leibniz University** Hanover, Germany
Research Assitant (part-time) May. 2019 - Apr. 2020
 - **Research Paper Investigation:** Collection of papers on object detection and application on aerial images
 - **Algorithm Development:** Development of object detection algorithms on aerial images
- **Rainbow Business Solution GmbH.** Hanover, Germany
Office Coordinator(part-time) Oct. 2018 - Jan. 2020
 - **Scheduling:** Appointments arrangement, Meeting organization, Conference setup
 - **Office Coordination:** Customer reception, invoice and document management, equipment maintenance
 - **Interpretation and Translation:** Key points conveying between German and Chinese and English
- **Institute of Cartography and Geoinformatics at Leibniz University** Hanover, Germany
Laboratory Mentor (part-time) Apr. 2018 - Apr. 2019
 - **Laboratory Supervision:** Support for students on poles detection with point cloud data
 - **Result Examination:** Evaluation the result of experiments and homework correction
- **Institute of Cartography and Geoinformatics at Leibniz University** Hanover, Germany
GUI Programmer for HD Mapping system (part-time) Feb. 2018 - Sep. 2018
 - **GUI Design:** Design of multiple interfaces under tabs for different threads with Qt5 library
 - **Multi Threading:** Configuration of front end and back-end process in multiple tabs
 - **Sensor Data IO:** Automatic data transferring from sensors to HD mapping system
 - **Scene Visualization:** Visualization of a fused 3D scene of point cloud and binocular camera
 - **Algorithm Adaptation:** Adaptation of research paper code to the system, such as Fast Global Registration
- **Zhonghong Geodesy Technology Research Institute** Changzhou, China
surveyor(intern) Jan. 2017 - July. 2017
 - **Survey Plan Design:** Estimation of surveying precision and feasibility
 - **Scheduling:** Time planing on each part of surveying task
 - **Result Adjustment:** Adjustment of the GPS antenna collected data and technical report

PROFESSIONAL CERTIFICATE

- **Sensor Fusion Engineer** Udacity Nanodegree
- **Deep Reinforcement Learning Expert** Udacity Nanodegree

SKILLS

- **Programming Languages** C++, Python, Matlab, Html, Markdown, etc.
- **Tools** CMAKE, ROS, PCL, OpenCV, OpenGL, PCL, Eigen, g2o, ceres, Pytorch, Qt5, etc.
- **Speaking Languages** English(C1), German(B2-C1), Chinese(C2).

PROJECTS

- **Digital Earth based on Web Map Service** Individual, 2017
Digital Earth; C++; Web Service; Tomcat; OpenGL; Pangolin; CMake; GDAL Windows/Ubuntu
 - **Web Map Service(WMS):** Broadcasting web map service of grid maps on a local server with Apache Tomcat
 - **Client Application:** Prototype of a digital earth with function to download satellite images with UI
 - **Geographic Grid Technology:** Densification of Ikosaeder in different sampling resolutions
- **LEGO Robot Courier Simulation** Team, 2017-2018
Mobile Robot; Sensor Fusion; SLAM; Embedded System; C++; ROS; CMake; OpenCV Ubuntu
 - **Sensor & Motion Model:** Lidar/Ultrasonic Unit/Camera; Differential drive kinematics
 - **Platform Calibration:** Camera(Zhang's Algorithm); Odometer: driven circle(CW and CCW); Lidar(calibrated)
 - **Localization:** Transform estimation via ICP; Global localization with camera; state optimized by KF
 - **Mapping:** 2 dimensional grid map with VoxelGrid filter
 - **Path Planning:** A* algorithm with cost map
- **Sensor Fusion based on Set-membership KF with GPS and IMU** Team, 2018
SMKF; Matlab Windows
 - **Uncertainty Model:** Ellipsoid space enclosed by Gaussian distribution.
 - **Application:** Non-rigid body Transformation
- **LiDAR-based Georeferencing of Kinematic Multi-Sensor-Systems** Team, 2018
Map Alignment; Georeferencing; IEKF; Matlab Windows
 - **PointCloud Assignment:** Assignment of points to building facades (plains) and lanterns (poles)
 - **Measurement Updating:** Robot state optimization by IEKF with implicit constraint.
- **Dynamic Landmark based Visual Odometry** Team, 2019
SFM; VIO; SLAM; 3D Reconstruction; Matlab; Python Windows
 - **Keypoints and Descriptors:** Traditional Keypoints(SIFT,SURF,ORB,FREAK,BRISK); Deep learning keypoint(SuperPoint); Evaluated on different scenes.
 - **Keypoints Matching:** RANSAC framework with epipolar constraint.
 - **Motion Estimation:** Rigid body transformation estimation with matching points
 - **Sparse Map Reconstruction:** Keypoints reprojection to local 3d coordinate system by stereo configuration
 - **Dynamic filtering:** Pose Estimation w.r.t preceding car; optimization with EKF.
 - **Performance Evaluation:** Accuracy and Efficiency in different scenes.
- **Object Tracking and Motion Prediction via KFs** Individual, 2019
Object tracking; Deep learning; Kalman Filtering; C++ Ubuntu
 - **Object Extraction:** Camera(Deep learning bounding box) and Lidar(RANSAC surface matching/Euclidean clustering and segmentation)
 - **Object Matching:** Matching bounding box with MAD/SAD/SSD/MSD/NCC and 3D Bbox with point cloud.
 - **Motion Prediction:** Application of Unscented Kalman Filter(UKF) and Extended Kalman Filter(EKF) to predict motion of preceding cars.
- **Real-time Point Cloud Rectification with Multiple Lidars** Team, 2019
HD Mapping; ROS; C++; CMAKE Ubuntu
 - **Platform Calibration:** ICP transformation estimation in a closed geometric space configuration
 - **Time Synchronization:** GPS Time synchronization consistent with Mobile Mapping System
 - **Point Cloud Rectification:** GPS coordinate interpolation in the last time interval/Point cloud interpolation between recording time frames
- **PanUrban Dataset - A panoptic dataset in aerial imagery** Individual, 2020
Benchmark; Python; OpenCV; Annotation Interface Ubuntu
 - **Semi-automatic Workflow:** Workflow from semantic dataset to instance dataset then to panoptic dataset
 - **Annotation Format:** COCO style annotation format.
 - **Full Range Augmentation:** Sampling annotation and source image from a large training patch.
- **Panoptic Segmentation in urban Area with aerial Imagery** Individual, 2020-2021
Object Detection; Semantic Segmentation; Instance segmentation Ubuntu/Cloud Platform
 - **Rotational Object:** Rotational Bounding box better enclose buildings and cars
 - **Multiple tasks:** Rotated Faster RCNN/ Rotated Mask-RCNN/ Rotated PanopticFPN
 - **Evaluation:** instance segment and bounding box(AP); stuff segment(IoU and ACC); all segments(PQ/RQ/SQ).