Jie Yuan

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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 Assistant (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 Lebiniz 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 thesystem, 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.*
- **Tech Stacks** — *ROS, PCL, OpenCV, OpenGL, PCL, Eigen, g2o, ceres, Pytorch, Qt5, etc.*
- **Tools** — *CMAKE, Docker, WSL, Git, MS Office, Latex, 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: dirven cicle(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 reprejection to local 3d coordinate system by stereo configuration
  - **Dynamic filtering**: Pose Estimation w.r.t preceding car; optimization with EFK.
  - **Performance Evaluation**: Accuracy and Efficiency in different scenes.
- **Object Tracking and Motion Prediction with 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 Extented 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).