

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

- **IPI in 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:** Business operation by calling, answering and scheduling, files archive, fixing devices.
 - **Interpretation and Translation:** Key points conveying between German and Chinese
- **IKG in Leibniz University** Hanover, Germany
Labor Mentor (part-time) Apr. 2018 - Apr. 2019
 - **Labor Supervision:** Support for students on poles detection with point cloud data
 - **Result Examination:** Evaluation the result of experiments and homework
- **IKG in 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 fresh research papers to the mapping system
- **Zhonghong Geodesy Technology Research Institute** Changzhou, China
surveyor(intern) Jan. 2017 - July. 2017
 - **Survey Plan Design:** Estimation of surveying accuracy and feasibility
 - **Scheduling:** Time planing on each part of surveying task
 - **Result Adjustment:** Adjustment of the GPS antenna collected data and technical report

PROJECTS

- **Digital Earth based on Web Map Service** Individual, 2017
Digital Earth; C++; Web Service; Tomcat; OpenGL; Pangolin; CMake 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 interface, written in C++ with GDAL library
 - **Geographic Grid Technology:** Densification of Ikosaeder in different sampling resolutions
- **LEGO 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

- **Calibration:** External Camera: Localization by Arena Square; Odometer: clockwise and counter-clockwise square and circle drive. Extrinsic parameters between sensors are ignored.
- **Localization:** Motion estimation with ICP on point cloud; global localization with camera; localization optimized by kalman filtering.
- **Mapping:** 2 dimensional grid map with VoxelGrid filter
- **Path Planning:** A* algorithm with cost map
- **Control:** Iterative going and turning

• **Sensor Fusion based on Set-membership KF**

Team, 2018

SMKF; Matlab

Windows

- **Uncertainty Model:** ellipsoid space enclosed by Gaussian distribution.
- **Application:** Non-rigid body Transformation

• **Dynamic Landmark based Visual Odometry**

Team, 2018

SFM; VIO; SLAM; 3D Reconstruction; Matlab; Python

Windows

- **Keypoints and Descriptors:** Traditional Keypoints: SIFT,SURE,ORB,FREAK,BRISK,and an unknown deep learning keypoint.
- **Keypoints Matching:** RANSAC framework with epipolar constraint.
- **Motion Estimation:** Rigid body transformation with matching points
- **Sparse Map Reconstruction:** Keypoints rejection to local coordinate system.
- **Performance Evaluation:** Accuracy and Efficiency in different scenes.

• **Object Tracking and Motion Prediction via KFs**

Individual, 2018

Object tracking; Deep learning; Kalman Filtering; C++

Ubuntu

- **Object Extraction:** Camera: Deep learning bounding box; Lidar: RANSAC surface matching/Euclidean clustering and segmentation
- **Object Matching:** ID assignment: Matching bounding box with MAD/SAD/SSD/MSD/NCC; 3D bounding box with point cloud.
- **Motion Prediction:** Apply 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**

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:** AP on instance mask and bounding box, IoU and ACC on Semantic, PQ/RQ/SQ on panoptic level.

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, Pytorch, Qt5, etc.

• **Speaking Languages**

English(C1), German(B2-C1), Chinese(C2).