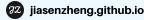
# **JIASEN ZHENG**

jiasenzheng2020@u.northwestern.edu



linkedin.com/in/jiasen-zheng



(224) 204 - 3864

### **EDUCATION**

#### **NORTHWESTERN UNIVERSITY**

MS in ROBOTICS GPA: 3.93/4.00 Sep 2021 - Dec 2022

#### **UNION COLLEGE (NY)**

BS in MECHANICAL ENGINEERING (Departmental Honorary) Sep 2015 - Jun 2019

### **SKILLS**

### **ROBOTICS**

• Perception: OpenCV, PCL • Planning: A\*, RRT, Frontier Exploration

- SLAM: Stereo Visual Odometry, RTAB Map. Slam Toolbox. Sensor Fusion
- Control: PID control, Kinematics,
- Simulation: Lagrangian Dynamics, Coppelia Sim

### **SOFTWARE**

• Programming: Python, C++, C, Matlab

• Robot Operating System (ROS): Movelt, Gazebo, Rviz

• Other: Linux, Git

### **ELECTRICAL**

• Embedded: PIC32, Arduino

· Soldering, Wiring

### **MECHANICAL**

• CAD: SolidWorks, AutoCAD

- Simulation (FEA): Stress-Strain, Heat transfer, Topology Optimization (SolidWorks); Electromagnetic (Ansys); Fluid Dynamics (STAR-CCM+); Simulink (Matlab)
- Prototype: 3D printing, Laser cut, Mill, Lathe, Drill press

### **EXPERIENCE**

First Robotics Team 7522 | Mechanical Mentor (part-time) | Shanghai, CN Jun 2020 - Jun 2021

- Advised a team of 5 to build a ball-shooting mechanism of a robot for the season "Infinite Recharge", which won 1st place at the WE RoboStar 2020 game in Guangzhou
- Guided design, in SolidWorks, of a swerve drivetrain, which significantly improved the agility and traction of the robot
- Mentored students on using SolidWorks and developed an online video tutorial on

### ZF Automotive (ZJG Plant) | Manufacturing Engineer Intern | Suzhou, CN Feb 2020 - May 2020

- Analyzed data from the automated Electric Parking Brake (EPB) assembly line to identify and help correct errors caused by the automatic mechanisms shortening the cycle time by 3%
- Developed a piston press-in approach to reduce the damage to piston seal and excluder of the brake, enhancing the First Pass Yield (FPY) by 0.5%

### Runshan Precision Machinery | Mechanical Engineer | Suzhou, CN July 2019 - Jan 2020

- · Collaborated with a senior engineer to design a new model of knitting machine using SolidWorks and applied FEA for design validation
- Performed topology optimization for load-bearing components to maintain strength and save material costs
- · Participated in the mechanical design of a ring gear driving mechanism of circular knitting machines and filed for domestic patents (China Patent No. 201911363163.5)

## **PROJECTS**

jiasenzheng.github.io

#### Extended Kalman Filter (EKF) SLAM From Scratch on Turtlebot3

- Developed a feature-based EKF SLAM package using C++ and Robot Operating System (ROS) in both simulation and real robot
- Implemented a landmark detection algorithm using supervised learning with unknown data association and wrote a control library for differential drive robot

### 3D SLAM And Point Cloud Colorization on Jackal UGV

- Performed 3D SLAM on Jackal UGV with Velodyne Lidar and Realsense camera using Robot Operating System (ROS) and the RTAB-Map package
- Developed a C++ ROS package to calibrate and compute the extrinsic parameters between lidar and camera using direct linear transform (DLT)
- Wrote a perception algorithm with C++ to align RGB data to the point cloud using PCL

#### Stereo Visual Odometry Using KITTI Dataset

- Created a visual odometry with stereo camera setup on the KITTI dataset using
- Calculated disparity maps and performed feature extractions using SIFT in OpenCV
- Applied RANSAC solver from OpenCV to determine the 3D rigid body transform between each frame
- Estimated the position and orientation of the vehicle within a reasonable drift (lower than 50m at loop closure)

### Marker Assembling Robot

- Collaborated with a team of 5 to control a Franka arm to assemble markers and caps through a sequence of pick, place, press, and sort operations using Robot Operating System (ROS), and Movelt
- Led the development of a computer vision algorithm with OpenCV to detect a wide range of colors and their positions
- In 50 rounds of testing with 9 of markers under different situations, the vision system was 100% reliable