

Zhijing Hu

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🌐 ZhijingHu-Rey

💬 KikinRey

EDUCATION

Johns Hopkins University

Master of Science in Engineering in Robotics

- Top 20% | Program Track: Perception and Cognitive Systems | Top 10 in AI Course Competition on Kaggle (8th / 102)

Baltimore, MD, US

Aug 2021 - May 2023

Rutgers University - New Brunswick

Bachelor of Science in Mechanical Engineering with Honors

- Top 20% | Honor Student in Dean's Lists | Best Overall ME Senior Design of Class 2021

New Brunswick, NJ, US

Aug 2017 - May 2021

WORK EXPERIENCE

Hangzhou KEQIANG Information Technology Co., Ltd

Research & Development Engineer Intern

- Researched on and operated the Injection Molding Machine to complete an entire molding automation via Python, and learned to build basic OPC servers with Python and C#, and successfully applied 2 demo servers to IFMS
- Collaborated with Back-end team to improve alarming system in High-Net Control System, sending the routine and important notifications and emails on computer interfaces and mobile APP in 3s or emergencies alarms in real-time
- Participated in energy saving reconstruction and monthly system maintenance, saving 9% workshop cost, and monitored the automation production line, filtering out 3,000+ defective products

Zhejiang, CN

June 2021 - Aug 2021

VALEO Automotive System Co.Ltd

Mechanical Engineer Intern

- Worked intensively with research team to sort large data pool of keywords from aftermarket reports via Excel, and participated into building a logistic regression model, resulting in a 80% lift on productivity of target wiping blade
- Collaborated with a team of 12 to investigate the key characteristics of wiping system and the material performances, and worked with product manager to complete the project decisions, product managements and safety plans
- Researched on and analyzed the attack angles of 2 wiper systems, Parallel system and Overlap system, and conducted FEA analysis on all components of both wiper system on SolidWorks

Zhejiang, CN

June 2020 - Aug 2020

PROJECTS

CV & MACHINE PERCEPTION

SLAM Auto-driving Car Robot

- Developed and improved the ORB-SLAM2 algorithm in C++ and implemented 5+ demo simulations in Gazebo and ROS with monocular and RGB-D camera image inputs, drawing satisfying PointCloud2 maps on R-viz after exploring
- Partnered to set up hardware, manipulating images and features using OpenCv with C++, pre-tested the performance and accuracy of the algorithm on the existing dataset with Raspberry Pi and laptop

Various Hand Gestures and Motion Recognition

- Designed and created our own datasets with 8 different hand gestures by collecting 10,000+ RGB images from webcam, classified and tested with the convolutional neural network (CNN) in Python
- Improved the object extraction method based on the landmarks, cropping out the images with 21 key points
- Trained the model with 8,000+ images including both RGB images and landmark images, and later evaluated on the 1,000+ validation images, achieving 97.6% accuracy with real-time speed of 60 (\pm 20) fps via MediaPipe

CONTROL & PLANNING

UR 5 Robot

- Participated in multiple UR5 Rotor motion planning project, studied and developed various algorithms such as Hand-Eye Calibration, RRT, EST and etc. in Probabilistic Roadmap (PRM) problem, using C++ and MATLAB on ROS
- Familiar with Linux and handed on robot operations in the lab, later tested and performed the robotics assignments

Tripod Arms Grabbing Robot based on Delta 3D Printer

- Debugged and improved the functionality of stepper motors in Arduino with C/C++ to preform the locate motion according to the recognition result outputs
- Collaborated with teammates to investigate the 3D rotations, translations and motion velocities of rail joints using ROS and MATLAB with over 2000+ 3D coordinate matrices and optimize the motion path of grabbing hand, increasing the success rate of grabbing target to 98% with 300+ grabbing trails

AUTO & MECHANISM DESIGN

Haptic Vision Cap for Visually Impaired Users

- Developed and improved the system functionality named Detect-to-Signal in C/C++ on Arduino with 4 vibration feedback modes according to different presence of approaching objects to the users
- Led a team of 4 to designed and worked on the Haptic Cap System with 4 direction vibrator motors, IR and Ultrasonic sensors in SolidWorks, and later handcrafted on laser cutting and 3D printing

Low Cost COVID-19 Ventilator

- Developed and debugged the functionality in controlling the stepper motors using C/C++ in Arduino, realizing 3 different speeds of air delivery according to required user modes
- Designed and improved 5+ sub-assemblies of ventilators in air delivery system and bellow-based compressor mechanism using SolidWorks, and helped the teammates to revise the left subsystems in AutoCAD with 5+ versions
- Analyzed and simulated different air flows in 10+ tube models using MATLAB and ANSYS