Yuanhang Liu

Email:yuanhang.liu@kcl.ac.uk

Education Background

King's College London London–UK

Master of Robotics *Sep.2023 - Current*

SEM1(Present): Robot Kinematics and Motion Planning, Machine Learning for Engineers, Computer Vision
SEM2: Intelligence and Autonomy, Sensing and Perception, Technologies, Innovation and Management

China University of Mining and Technology (Beijing) Beijing–China

Robot Engineering *Sep.2019-Jun.2023*

GPA: 3.68/4
School Honors: University-level Scholarships
Main courses: Control Engineering, Robotics, Fundamentals of Robot Operating System, Machine Vision and Intelligent Control, Mobile Robot Localization and Navigation ect.

Languages and Skills

- **Language Skills**: Chinese (Native); English (IELTS Band6.5: R8 L6 W6 S5.5)
- **Software Skills**: CAD; SOLIDWORKS; LaTex; ROS
- **Programming Languages**: C; C++; Python; OpenCV

Awards

First Prize for Beijing Engineering Practice and Innovation Ability Competition *2022 - 2023*

Beijing Municipal Commission of Education

- Use physical outcome from program **"Constrained Space Autonomous Sensing Technology with Information Fusion"** to take part in this competition
- Use PPT to introduce and present the working videos of the physical product

Successful Participant for China Undergraduate Mathematical Contest in Modeling *2021 - 2022*

Chinese Society of Industrial and Applied Mathematics

- Finish a thesis whose name is "An enterprise raw material ordering and transportation planning model based on optimization method" and
- Use Matlab to program to get results and typeset articles using latex
- Use Principal Component Analysis (PCAs) and Analytic Hierarchy Process (AHP), respectively, to reduce the dimension of data and set the weight of data

Second Prize for The National Mathematics Competitions for College Student *2020 - 2021*

Chinese mathematical association

- Complete the written examination with knowledge of advanced mathematics and linear algebra

Third Prize for Mathematical Knowledge Contest (School-Level) *2020 - 2021*

Science School of China University of Mining and Technology (Beijing)

- Pass the preliminary test first and then collaborate with team members to complete the math and physics problems on the spot in time

Academic Projects

Research on Visual Odometry Based on Optical Flow Method (Dissertation Project) *Jan.2023-Jun.2023*

- Conduct the literature review about visual odometry and find the localization problem under scenes with no rich feature
- Research feature extraction algorithms Harris and Fast and examine and compare abilities of feature extraction and time consumption levels
- Research feature extraction algorithms Harris and Fast and examine and compare the ability of feature extraction and time consumption level

- Analyse different and traditional optical flow calculation methods, including HS and LK, to feed the time requirement of visual odometry and deal with the LK's disadvantage on excessive constraints by choosing LK based on image pyramid
- Combine extraction algorithms, optical flow method and visual odometry basic model, creating a visual odometry system and testing the location ability of the system under scenes with no rich feature

Constrained Space Autonomous Sensing Technology with Information Fusion *May.2021-May.2022*

- Conduct the literature review to learn about the design of stereo omnidirectional vision sensor and the camera calibration method of single plane checkerboard
- Use the calibration board to calibrate the sensor and obtain the internal and external parameters of the camera
- Build the sensor model linking the two-dimensional pixel point coordinates and the point coordinates of the world coordinate system (WCS)

COVID-19 Prediction Based on Spatio-Temporal Deep Neural Network Model *Jan.2021-Mar.2021*

- Use Python and web developer tools to collect data on the number of COVID-19 infections in cities in the US, China, the UK, and France, the number of population movements at airports or train stations, the level of economic development, medical conditions and environmental quality through public information
- Build up the environment of Python and Anaconda (Python function library) in personal computer
- Understand the overall process of deep learning model training and input the collected data into our Spatio-temporal neural network to train the model on a high-performance GPU
- Collect figures of train error and test error of deep neural network modules (STNN, STNN-A, STNN-I) and change figures of hidden layers and learning rate to improve abilities of prediction and fitting of the modules

Social Practice and School Activities

Social Practice with Spreading Knowledge and Spirit of the Winter Olympics *Aug.2021*

- Conduct interviews and gather photo and video materials at venues related to the Winter Olympics

Social Practice with the Theme of "Fight the Pandemic Together" *Aug.2020*

- Interview people about their daily lives as a team member during the pandemic and collect evaluations from people regarding the government's epidemic prevention capabilities

Volunteer Sevice in China Medical University Aviation General Hospital *Nov.2019*

- Guide patients to seek medical treatment in an orderly manner while also assisting them in printing out their examination results from the self-service machines

Welcome Party of Institute of Mechanical and Electrical Engineering *Oct.2019*

- Describe the history stories of our college with other students using the local Chinese dialect