Yifei Lyu

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EDUCATION

University of California, Berkeley ***Aug. 2022 – Present (Expected May. 2023)***
Master of Engineering in Electronic Engineering Computer Science (EECS)
Concentration: Robotics and Embedded Software
GPA: 3.83/4.0
Fung Institute's Scholarship
Relevant Courses: Deep Reinforcement Learning, Decision Making, and Control, Principles and Techniques of Data Science, Experimental Design for Machine Learning, Embedded System Design: Modeling, Analysis, and Synthesis

Southeast University ***Jul. 2018 – Jul. 2022***
Bachelor of Engineering in Robotics
GPA: 3.88/4.0, Average Score: 91/100, Ranking: 2/37
President's Scholarship (Top 1%)
Relevant Courses: Fundamentals of Data Structures, Introduction to Artificial Intelligence, Digital Image Processing, Robotics Basics, Robot Software Engineering, Robot Dynamics and Control, Intelligent Robot System Synthesis Design

SKILLS

Computer Skills: Python, ROS 1, ROS 2, Gazebo, Webots, PyTorch, OpenCV, NumPy, Pandas, Git
Robot Experience: Mobile Robots (NEXT, Turtlebot, EAI), Robot Arms (FANUC, Yaskawa, ESTUN, ABB)

WORK EXPERIENCE

Deep Learning / Computer Vision Engineering Intern
Jia Kang Zhong Zhi Technology Co., Ltd. ***Feb. 2022 – Mar. 2022***
- Researched and implemented cutting-edge deep learning algorithms in the direction of human key point detection
- Improved and optimized computer vision algorithms for specific needs of medical rehabilitation projects

RESEARCH EXPERIENCE

Assistive Technology for Cursor Control by Capturing Hand Movements

Group Leader, Advisor: Prof. Brian A. Barsky, University of California, Berkeley ***Aug. 2022 – Present***
- Applied Mediapipe for hand key point detection
- Utilized a Transformer-based model to recognize American Sign Language in real-time using a laptop's built-in webcam

Multi-robot SLAM and Perception with Divergent Viewpoints

Research Assistant, Advisor: Assistant Prof. Tin Lun Lam, Chinese University of Hong Kong ***Jun. 2021 – Aug. 2021***
- Researched and gave a comprehensive review presentation on 3D point cloud registration
- Trained a policy network by considering the point cloud registration as a reinforcement learning task
- Built a two-stream encoder-decoder network with an overlap-attention block to handle point-cloud pairs with low overlaps

SELECTED PROJECTS

PUMA560-based Flexible Packaging Item Sorting Robot Software System
- Conducted the simulation in MATLAB Robotics toolbox to model the environment and the PUMA560 robot
- Calculated the robot's operating space using Monte Carlo methods
- Trained the YOLOv5 model for recognition and classification of flexible packaging items
- Calculated and planned the trajectory of the robot arm to grasp-place items using the 5-3-5 approach in MATLAB

Supermarket Grasp-place Robot Software System
- Involved in the robot system requirement modeling for grasping and placing goods in the supermarket
- Processed the simulation based on Webots to build supermarket and goods environment
- Modeled a KUKA-youBot chassis and fork clamp robot
- Utilized depth cameras for object recognition and localization
- Wrote motion control code for the robot arm to grab and place goods and advance

Welcome Reception Robot Software System
- Built the Gazebo simulation environment, used turtlebot3 robot, equipped it with LIDAR and Kinect camera
- Applied three methods for object recognition: YOLOv3, find_object_2d (template matching), and OpenCV image processing
- Called Google Speech API to complete speech recognition; called Baidu API to complete face recognition and age estimation
- Utilized GMapping for SLAM and wrote A*algorithm for path planning
- Used SMACH to integrate all functional modules into a state machine and combined each module