Iou-Sheng (Danny) Chang

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Education

Johns Hopkins University, Laboratory for Computational Sensing and Robotics
Baltimore, MD, USA

M.S.E. in Robotics — *Expected 2024*

- Relevant Coursework: Robot Devices, Kinematics, Dynamics, and Control; Applied optimal Control; Machine Perception

University of California - Los Angeles, Henry Samueli School of Engineering
Los Angeles, CA, USA

B.S. in Electrical Engineering — *Sep. 2016 - Jun. 2019*

- **Dean's Honors List** · Senior Capstone Project: Design of Robotic Systems · Technical Breadth Area: Engineering Science

Skills

Programming Languages	Python, C++, C, Java, MATLAB, Simulink, Arduino, LaTeX
Technologies/Frameworks	Linux, Robot Operating System (ROS), Git/Repo, Tensorflow, Pytorch, OpenCV
CAD and Analysis	Solidworks, AutoCAD
Languages	**Native/Bilingual Proficiency:** Mandarin Chinese, Taiwanese · **Full Professional Proficiency:** English

Professional Experience

Jochu Technology Co., Ltd.
Hsinchu, Taiwan

Mechatronics and Control Engineer — *Jan. 2021 - Jul. 2022*

- Led the controls and electronics team for power mobility scooter — a qualified MDR Class I and FDA Class II medical device — project, including design of the electrical and wiring diagram, and implementation of the Vehicle Control System.
- Utilized Kalman filter to eliminate noise in the parking sensors designed and implemented for the power mobility scooter.
- Collaborated with partner company to design and implement the Obstacle Avoidance and Autopilot Control Algorithm for medical power wheelchair — WHILL Model M — designed by WHILL Inc.

Enhanced Handling Automation Technology Inc.
Taichung, Taiwan

Automation and Control Engineer | Internship — *May.- Dec. 2020 | Jul.- Sep. 2017*

- Programmed FANUC/YASKAWA industrial articulated robotic manipulator and designed paths for Transfer Machines.
- Used state estimation, and motion planning algorithm (RRT*) to design optimal path for robotic arms to avoid obstacles and prevent collisions. The path found proved to have improved assembly line efficiency, and reduced the manufacturing lead time by 20%.

Extracurricular Experience

Baja SAE | UCLA Bruin Racing
Los Angeles, CA, USA

Electronic Continuously Variable Transmission (ECVT) Control Lead [Demo][Demo] — *Sep. 2017 - Jun. 2019*

- Designed, implemented, and validated digital feedback control system for the electromechanically actuated CVT (ECVT) in a Baja SAE competition (3rd ever electromechanical transmission in the 44-year history of the Baja competition).
- Executed system identification and control of full vehicle powertrain by step and chirp response about region of interest using a custom MATLAB scripts, and synthesized a finite-state machine and closed loop control algorithm for the system.
- Created nonlinear plant model of the powertrain system in Simulink for use in control law design and simulation.

Project Experience

Machine Perception
Fall 2022

Team Project, 2 members | Python / Pytorch — *JHU*

- **Deep Convolutional Neural Network, Adversarial Attacks and Defense**: Built the GoogLeNet architecture with Pytorch, trained and tested on CIFAR-10 Dataset, and received a 92.68% test accuracy. [Report]
  - Successfully implemented various adversarial attacks methods (Fast Gradient Sign Method (FGSM), Noise, Semantic) on GoogLeNet.
  - Implemented Definsive Dillusion as a defense method against FGSM attack, and retained a test accuracy of 89%.
- **Structure from Motion**: Reconstructed 3-D rigid structure from motion using the Tomasi-Kanade Factorization method. [Report]

UCLA Senior Capstone Project - Design of Robotic Systems
Winter 2019 - Spring 2019

Team Project, 4 members | MATLAB / C++ / OpenCV — *UCLA*

- Controlled the printable 2 wheeled paper robot to find an optimal obstacle free path from the initial state to the final state (target positions) and performed parallel parking by implementing the developed RRT based planner (RRT*) , Markov Decision Process (MDP) model, and Kalman filter in MATLAB. [Report] [Demo]
- Built a Remote Control Facial Detection Snack Launching Robot by designing 3D printable mechanism, performing facial detection with OpenCV, deriving the mathematical launch/trajectory model, and implementing the control system in MATLAB. [Report] [Demo]