(858) 588-1141
La Jolla, California
chw120@ucsd.edu

Chung-Pang Wang

Estimation and Control in Robotics, Machine Learning

fefei69
Chung-Pang

Education

University of California, San Diego (UC San Diego) *San Diego, CA*
MS, Department of Electrical and Computer Engineering *Sep. 2023 - Jun. 2025*
- Cum. GPA: 3.63/4.0
- Coursework: (*Theoretical*) Linear System Theory, Linear Algebra and Application, Statistical Learning, Semidefinite and Sum-of-squares Optimization. (*Applied*) Sensing and Estimation in Robotics, Planning and Learning in Robotics, Intro to Visual Learning.

National Sun Yat-sen University (NSYSU) *Kaoshiung, Taiwan*
BS, Department of Mechanical and Electro-Mechanical Engineering *Sep. 2018 - Jun. 2022*
- Cum. GPA: 3.84/4.0 | Ranking: 8/132
- Coursework: (*Theoretical*) Stochastic Process and Modeling, Classical/Digital Control, Digital Signal Processing. (*Applied*) Introduction to Neural Networks, Introduction to Artificial Intelligence, Machine Vision.

Publications

† indicates equal contributions

Xiao Liang†, **Chung-Pang Wang**†, Nikhil Uday Shinde, Fei Liu, Florian Richter, Michael Yip. MEDiC: Autonomous Surgical Robotic Assistance to Maximizing Exposure for Dissection and Cautery.
IEEE International Conference on Robotics and Automation (ICRA), 2025. ***Under Review***

Ching-Fang Chien†, Jia-Li Sung†, **Chung-Pang Wang**, Chen-Wen Yen, Yuan-Han Yang. Analyzing Facial Asymmetry in Alzheimer's Dementia Using Image-Based Technology. *Biomedicines 2023*, *11, 2802*.

Research Experience

Advanced Robotics and Controls Lab (ARCLAB), UC San Diego
Graduate Student Researcher, Advised by Prof. Michael Yip *Oct. 2023 - Present*
- Proposed a framework to autonomously maximize visual exposure for surgical dissection assistance through **visual-servoing control** with the Jacobian of the differentiable physics model.
- Designed a novel metric to select the optimal points on the tissue to manipulate, **maximizing its controllability** for effective retraction and visual exposure.
- Developed a data-driven approach to learn **sim-to-real residual dynamics** online from past soft-body deformation trajectories using GNN. This method bridged the positional gap between XPBD simulations and real soft-body states, improving future deformation rollouts and potentially advancing deformable object manipulation.
- Trained ArtEq, a part-based **SE(3)-equivariant neural network**, to estimate Panda Arm's pose from point cloud inputs. Aimed to enable data-efficient transfer of motion tasks between robotic arms.

Mechatronics in Medicine Lab, NSYSU
Undergraduate Student Researcher, Advised by Prof. Chen-Wen Yen *Nov. 2021 - Dec. 2022*
- Trained a rank-consistent ordinal regression network with transfer learning to estimate age from facial images, demonstrating that Alzheimer's patients visually appear older than their actual age, aiding physicians in fast and accurate diagnosis.

Selected Projects

Infinite-Horizon Stochastic Optimal Control *Jun. 2024 - Jul. 2024*
- Developed a safe trajectory tracking algorithm for a ground differential-drive robot by formulating a discounted infinite-horizon stochastic optimal control problem. Solved the problem using both **certainty equivalent control (CEC)** and **generalized policy iteration (GPI)**.

LiDAR-based SLAM *Mar. 2024 - Apr. 2024*
- Implemented SLAM on a differential-drive robot using encoder and IMU odometry with LiDAR scan matching to build occupancy and texture maps. Enhanced trajectory estimation through **pose graph optimization** with loop closure constraints using **GTSAM**.

Awards & Services

Summer Research Internship Program (ARCLAB, UC San Diego) Jul. 2024 - Aug. 2024
Teaching Assistant for Engineering Math I & II (NSYSU) Sep. 2021 - Jan. 2022
NSYSU Academic Excellence Award*2 (Top 5% in class) Jun. 2020, Feb. 2021
NSYSU Calculus Contest Distinguished Award (Cross-Departmental) May. 2019

Skills

Programming Python, MATLAB, C++, PyTorch, NumPy, PyVista, JAX, ROS, Linux, Git, LaTeX