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Chung-Pang Wang

SENSING AND CONTROL IN ROBOTICS, MACHINE LEARNING

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Chung-Pang

Education

University of California San Diego (UCSD) *San Diego, CA*

MS, Department of Electrical and Computer Engineering *Sep. 2023 - Present*

- Cum. GPA: 3.66/4.0

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

Publications

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 Internation 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, UCSD

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 a differentiable physics model. Designed a metric to select the optimal control position using **deformable Jacobian analysis.**
- Developed a data-driven approach using a GNN to learn **sim-to-real residual dynamics** online from past soft-body deformation trajectories. Bridged the gap between XPBD simulations and real tissue state to improve future deformation rollouts and further enhance soft-body manipulation.
- Trained ArtEq, a part-based **SE(3)-equivariant neural network**, to predict Panda Arm's pose from point cloud inputs. Aimed to enable data-efficient transfer of motion tasks from one robotic arm to others.

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 for estimating age from elderly facial images with transfer learning techniques, demonstrating that Alzheimer's patients visually appear older than their actual age, aiding physicians in faster and more 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**.

Honor / Competition

Calculus Contest distinguished award (Cross-Departmental) *May. 2019*
Academic Excellence Award*2 (Top 5% in class) *Jun. 2020, Feb. 2021*

Work Experience

Summer Research Internship Program (ARCLAB, UCSD) *Jul. 2024 - Aug. 2024*
Teaching Assistant for Engineering Math (ME Dept., NSYSU) *Sep. 2021 - Jun. 2022*

Skills

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