

Jui-Te ‘Ray’ Huang

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Education

Carnegie Mellon University

PhD in Robotics
MS in Robotics (MSR)

Pittsburgh PA.

~ Current
~ May. 2024

National Yang Ming Chiao Tung University

BS, MS in Department of Electrical and Computer Engineering

Hsinchu Taiwan

~ Aug. 2021

Experiences

Research Assistant, Carnegie Mellon University

Sep. 2022 ~ present, Pittsburgh PA.

Robot Perception Lab, Advised by Prof. Michael Kaess.

- Radar-Inertial State Estimation and Mapping using mmWave Imaging Radar.
 - Research on robust state estimation system in adverse environmental condition.
 - Implemented Radar-Visual-Inertial sensor fusion state estimation.
 - Developed large scale out door SLAM system using multiple high resolution imaging radar.
 - Research on learning based radar signal processing for state estimation.
- GPU accelerated Radar signal processing.
 - Implemented MIMO signal processing pipeline generate radar point cloud from digital signal.
 - Implemented Synthetic Aperture Radar algorithm to create mmWave radar occupancy map.
- Built a multi-modal sensor rig (Radar, LiDAR, stereo RGB/thermal/event cameras) and co-led a large-scale data collection campaign.

Research Intern, Bosch Research USA

May. 2026 ~ Aug. 2026, Pittsburgh PA.

May. 2025 ~ Aug. 2025, Pittsburgh PA.

- Research on data driven simulator for mmWave radar spectrum with conditional diffusion modeling.
- Built a large-scale training and evaluation pipeline for radar diffusion model.

Research Intern, University of Washington

Sep. 2021 ~ Feb. 2022, Seattle WA.

Information Processing Lab, Advised by Prof. Jenq-Neng Hwang.

- Built and calibrate sensor system to collect synchronized data for radar multi-object tracking.
- Learning-based Multi-Object Detection and Tracking using mmWave Imaging Radar.
- 3D Multi-Object Tracking using LiDAR and Visual Depth Estimation.

Research Assistant, National Chiao Tung University

Jun. 2018 ~ Aug. 2021, Hsinchu Taiwan

Assistive Robotics Group, Advised by Prof. Hsueh-Cheng Wang

- DARPA Subterranean Challenge, SLAM and Deep Reinforcement Learning Navigation
 - Team NCTU, Software Team Lead and Human Supervisor in SubT Challenge: Urban Circuit.
 - Implement LiDAR SLAM system for large-scale underground environments.
 - Research on navigation system using sim-to-real deep reinforcement learning.
 - Research on cross-modal learning to navigate robot through smoke using mmWave radar.
- Maritime RobotX Challenge, Autonomous Surface Vehicle
 - Built sensor and computation system for autonomous boat (WAM-V).

Research Interest

SLAM, 3D Reconstruction, Multi-Modal Machine Learning,
Radar Perception, Field Robotics

Selected Projects & Publications

- **Radar-Inertial Odometry and Mapping**

- **Jui-Te Huang**, Tianshu Huang, Anthony Rowe and Michael Kaess “UNRIO: Uncertainty-Aware Velocity Learning for Radar-Inertial Odometry” in submission, 2026
- **Jui-Te Huang***, Ruoyang Xu*. Radar in Robotics SLAM challenge 1st place. ICRA 2026 workshop.
- **Jui-Te Huang**, Ruoyang Xu, and Michael Kaess “Millimeter Wave Radar: From Synthetic Aperture to Probabilistic Mapping” *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2026.
- **Jui-Te Huang**, Ruoyang Xu, Akshay Hinduja, and Michael Kaess “Multi-Radar Inertial Odometry for 3D State Estimation using mmWave Imaging Radar” *IEEE International Conference on Robotics and Automation (ICRA)*, 2024.

- **Radar Multi-Object Tracking for autonomous driving applications**

- Wang, Y., Cheng, J.H., **Huang, J.T.**, Kuan, S.Y., Fu, Q., Ni, C., Hao, S., Wang, G., Xing, G., Liu, H. and Hwang, J.N., Vision meets mmWave Radar: 3D Object Perception Benchmark for Autonomous Driving. IEEE Intelligent Vehicles Symposium (IV), 2023.

- **Search and Rescue in DARPA Subterranean Challenge**

- C.-L Lu*, **J.-T. Huang***, C.-I Huang, Z.-Y. Liu, C.-C. Hsu, Y.-Y. Huang, S.-C. Huang, P.-K. Chang, Z. L. Ewe, P.-J. Huang, P.-L. Li, B.-H. Wang, L.-S. Yim, S.-W. Huang, M.-S Bai, H.-C. Wang, “A Heterogeneous Unmanned Ground Vehicle and Blimp Robot Team for Search and Rescue using Data-driven Autonomy and Communication-aware Navigation” *Field Robotics - Special Issue: Advancements and lessons learned during Phase I & II of the DARPA Subterranean Challenge. 2022* (*Equal Contribution)

- **Cross-modal Learning and Reinforcement Learning for Navigation**

- **J.-T. Huang**, C.-L. Lu, P.-K. Chang, C.-I Huang, C.-C. Hsu, Z. L. Ewe, P.-J. Huang, and H.-C. Wang, “Cross-Modal Contrastive Learning of Representations for Navigation using Lightweight, Low-Cost Millimeter Wave Radar for Adverse Environmental Conditions” *IEEE Robotics and Automation Letters 2021, (RA-L)*. 6(2), 3333-3340.
- C.-L. Lu, Z.-Y. Liu, **J.-T. Huang**, C.-I Huang, B.-H. Wang, Y. C., N.-H. Wu, H.-C. Wang, L. Giarre, P.-Y. Kuo, “Assistive Navigation using Deep Reinforcement Learning Guiding Robot with UWB/Voice Beacons and Semantic Feedbacks for Blind and Visually Impaired People” *Frontiers in Robotics and AI 2021*.

Academic Services

- Teaching Assistant, CMU: 16833 Robot Localization and Mapping, 16822 Geometry Methods in Vision
- Teaching Assistant, NCTU: Sensing and Intelligent System, Human-Centric Computing Lab, Introduction to Artificial Intelligence
- Served as reviewer for IEEE IROS, ICRA, RAL, T-ASE.

Skills

- **Programming Language:** C++, Python, CUDA
- **Software, Middleware, and Libraries:** ROS, Docker, OpenCV, Open3D, PCL
- **Deep Learning / Optimization Framework:** PyTorch, JAX, GTSAM