Yutian Chen

yutianch@andrew.cmu.edu | github/MarkChenYutian | linkedIn/yutian-chen-469602223

## **EDUCATION**

Carnegie Mellon University | Expected Graduation Date: May 2025

Pittsburgh, PA | Sep 2021 - Now

BSc. Computer Science, Minor in Mathematical Science GPA: 3.95/4.0

Teaching Assistant: 10701 Intro to Machine Learning, 15122 Principles of Imperative Programming

# PUBLICATIONS

- MAC-VO: Metrics-aware Covariance for Learning-based Stereo Visual Odometry [link], arXiv
  - Qiu, Y.\*, **Chen, Y.**\*, Zhang, Z., Wang, W., Scherer, S.
- AirIMU: Learning Uncertainty Propagation for Inertial Odometry [link], arXiv Qiu, Y., Wang, C., Xu, C., Chen Y., Zhou, X., Xia, Y., Scherer, S.
- Token Prediction as Implicit Classification to Identify LLM-Generated Text [link], EMNLP, 2023 Chen, Y.\*, Kang, H.\*, Zhai, Y., Li, L., Singh, R., Raj, B.
- PyPose v0.6: The Imperative Programming Interface for Robotics [link], IROS Workshop, 2023 Zhan, Z., Li, X., Li, Q., He, H., Pandey, A., Xiao, H., Xu, Y., Chen, X., Xu, K., Cao, K., Zhao, Z., (...), Wang, C.
- Myocardial Segmentation of Cardiac MRI Sequences with Temporal Consistency for Coronary Artery Disease Diagnosis

#### [link], Frontier of Cardiovascular Medicine, 2022

**Chen, Y.**, Xie, W., Zhang, J., Qiu, H., Zeng, D., Shi, Y., Yuan, H., Zhuang, J., Jia, Q., Zhang, Y.,(...), Xu, X.

# **RESEARCH EXPERIENCE**

## Visual-Inertial SLAM | AIRLAB, ROBOTICS INSTITUTE, CMU

- Develop the MAC-VO, a visual odometry that outperforms the state-of-the-art visual odomtries like DPVO by 30%+ on relative translation error (RTE) and relative rotation error (ROE) in multiple public datasets.
- Utilize **conformal prediction** to estimate **metric-aware covariance**, which facilitates selecting high quality features and weighs the residual of backend optimization, improving the robustness of system under challenging scenes.
- Deploy the MAC-VO as ROS2 node on Orin-AGX on real drone and speedup the system by 4 times with Tensor RT.

## Embodied Al Simulator | IBM-MIT WATSON AI LAB

- City-scale 3D scene reconstruction based on real world satellite/street-view image for multi-agent simulator.
- Built an automatic scene refinement pipeline with Blender and diffusion model that produces **photo-realistic scene**.

## Differentiable Robotics Library | OPEN SOURCE DEVELOPER

• Contribute to PyPose, an auto-differentiation framework for Lie Algebra and Lie Group based on PyTorch.

## **LLM Detection** | LANGUAGE TECHNOLOGY INSTITUTE, CMU

- Propose, implement and evaluate a deep-learning model to detect textual content generated by multiple large language models. Reach accuracy of 95%, significantly out-perform existing detectors by large margin.
- Collect an open-source dataset OpenLLMText that contains 300k high-quality LLM generated text samples.

# WORK EXPERIENCE

#### Full Stack Developer | CARNEGIE MELLON UNIVERSITY

- Mentored by <u>Prof. Cervesato</u> and <u>Prof. Pfenning</u>, I worked on improving course's experience by designing and implementing an online CO language virtual machine using **TypeScript** and **React** and built visualizations for it.
- Used by 500+ students per semester in 15122 Principles of Imperative Programming. [Link] [GitHub Repo]

#### Sep 2022 - Now

May 2023 - Now

Mar 2024 - Now

Mar 2023 - Sep 2023

Pittsburgh, PA | Jul 2022 - Sep 2022