En Xu (Thomas) Li

thomasenxu.li@mail.utoronto.ca | 647-922-5333
https://thomas-enxuli.github.io | Toronto, Canada

Education

Sep 2017 – Apr 2022

Bachelor of Applied Science in Engineering Science, University of Toronto
Robotics Major, Artificial Intelligence Minor, Engineering Business Minor
3rd Year Annual GPA: 3.97
University of Toronto Scholar, NSERC Undergrad Student Research Award, Daisy Intelligence Scholarship, Dean's Honour List

Experience

Sep 2021 - Ongoing

University of Toronto Institute of Aerospace Studies | Undergraduate Thesis Student
Supervised by Prof. Steven Waslander, Toronto Robotics and Artificial Intelligence Laboratory

- Independent Research on 4D Panoptic LiDAR Segmentation for Autonomous Vehicles
- Designing and investigating LiDAR segmentation networks that could provide, 1) semantics of both static and dynamic environment, 2) shapes of the surrounding objects, and 3) past trajectories / tracks of the dynamic instances. Paper in preparation for *ECCV 2022*

May 2020 - Aug 2021

Noah's Ark Lab, Huawei Canada | 3D Perception Research Intern
Supervised by Dr. Bingbing Liu, Cognitive IoV Perception Team

- Built a custom PyTorch training pipeline for panoptic segmentation with LiDAR inputs
- Project lead for researching real-time deployable panoptic segmentation networks using LiDAR point cloud as inputs. First author of *CPSeg* and *SMAC-Seg*, state-of-the-art methods on SemanticKITTI panoptic segmentation benchmarks. Three Patents pending (as the main inventor), two paper (as the leading author) under review at *AAAI 2022* and *ICRA 2022*
- Designed and supported the development of high-performance perception models. Co-author of *AF2-S3net* (accepted at *CVPR 2021*) and *GP-S3net* (accepted at *ICCV 2021*). The two models are top ranked on SemanticKITTI and nuScenes semantic segmentation and panoptic segmentation challenges upon publication

May 2019 - Aug 2019

Department of ECE, University of Toronto | Summer Student Researcher
Supervised by Prof. Roman Genov, Intelligent Sensory Microsystems Laboratory

- Designed FSMs and Programmed the FPGA board (Opal Kelly XEM7310) to control 3D imaging cameras with CMOS sensors using Verilog and Python
- Improved the PC-FPGA communication and memory interfacing to allow faster data process by replacing sequential read/write to all-freedom DDR3 memory address mapping

Honors

2020

Daisy Intelligence Scholarship

- awarded to top ranked robotics major student based on course grades in the 3rd year

2019 **NSERC USRA**

- Undergraduate Student Research Award by Natural Sciences and Engineering Research Council of Canada

ESROP-U of T Fellowship [*declined*]

- awarded by Engineering Science Research Opportunities Program to pursue a paid summer research internship at University of Toronto

ESROP-Global Fellowship [*declined*]

- awarded by Engineering Science Research Opportunities Program to pursue a paid summer research internship at National University of Singapore

2017 **University of Toronto Scholar**
The Murray Calder Hendry Scholarship

Publications

2021 [1] **E. Li**, R. Razani, Y. Xu, B. Liu, "CPSeg: Cluster-free Panoptic Segmentation Network of LiDAR Point Clouds," *under review*, **AAAI** 2022
[2] **E. Li**, R. Razani, Y. Xu, B. Liu, "SMAC-Seg: LiDAR Panoptic Segmentation via Sparse Multi-directional Clustering," *under review*, **ICRA** 2022
[3] R. Razani*, R. Cheng*, **E. Li**, E. Tagahvi, Y. Ren, B. Liu, "GP-S3Net: Graph-based Panoptic Sparse Semantic Segmentation Network," **ICCV** 2021
[4] R. Cheng, R. Razani, E. Tagahvi, **E. Li**, B. Liu, "$(AF)^2$-S3Net: Attentive Feature Fusion with Adaptive Feature Selection for Sparse Semantic Segmentation Network," **CVPR** 2021

Patents

2021 [1] **E. Li**, R. Razani, Y. Ren, B. Liu, "METHODS AND SYSTEMS FOR DETERMINISTIC CALCULATION OF SURFACE NORMAL VECTORS FOR SPARSE POINT CLOUDS," *patent filing*, 2021
[2] **E. Li**, R. Razani, B. Liu, "SYSTEM AND METHOD FOR PANOTIC SEGMENTATION SYSTEM OF POINT CLOUDS," *patent filing*, 2021
[3] **E. Li**, R. Razani, B. Liu, "SYSTEM AND METHOD FOR PROPOSAL-FREE AND CLUSTER-FREE PANOPTIC SEGMENTATION SYSTEM OF POINT CLOUDS," *patent filing*, 2021