Yan Song Hu

University of Waterloo
Systems Design Engineering (MASc)

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Education

University of Waterloo
September 2022 – December 2024

Master of Applied Science (MASc) in Systems Design Engineering
- Leads development in dense neural SLAM research at the Vision and Image Processing Lab
- Developed state-of-the-art 3D Gaussian Splatting SLAM system for thesis
    - Envisioned and designed system, then led team through implementation and testing
    - Implemented machine vision, multi-view geometry, and dense reconstruction techniques using C++
- Mentored undergraduate research assistant in migrating SLAM code to ROS2

McMaster University
September 2016 – April 2022

Bachelor of Engineering with Co-op, Mechatronics with a Mathematics Minor & Business Minor
- Cumulative GPA of 11.8 out of 12.0 (Equivalent to A+)
- Dean's Honour List in all terms (Minimum grade of A-)
- Provost Honour Roll in 3rd year (A+ for all courses)

Publications

MGSO: Monocular Real-time Photometric SLAM with Efficient 3D Gaussian Splatting
Under Review

2025 IEEE International Conference on Robotics & Automation (ICRA) – 1st Author

SplatPose+: Real Time Image-Based Pose-Agnostic 3D Anomaly Detection

2024 European Conference on Computer Vision (ECCV) VISION Workshop
- Presented as poster during workshop session

Towards Real-Time Gaussian Splatting: Accelerating 3DGS through Photometric SLAM
Extended Abstract

40th Anniversary of the IEEE Conference on Robotics and Automation (ICRA@40) – 1st Author
- Presented during poster session

Integrating Inertial Data to a Hybrid Direct-Indirect Visual SLAM System
Extended Abstract

Volume 9 of the Journal of Computational Vision and Imaging Systems (CVIS 2023) – 1st Author
- Presented paper at local Waterloo conference and published in accompanying journal
- Won best vision paper at the conference

Scholarships & Awards

NSERC Canada Graduate Scholarships - Master's
NSERC Award – Spring 2023
$17500 value
- Awarded for research potential

University of Waterloo Engineering Excellence Fellowship
Waterloo Entrance Award – Fall 2022
$25000 value
- Graduate funding for students with a background of academic excellence

University of Waterloo Dean's Entrance Award
Waterloo Entrance Award – Fall 2022
$5000 value
- Entrance award for academic excellence

The University Senate Scholarship
McMaster In-Course Award – Fall 2021
$800 value
- Awarded for academic excellence

NSERC USRA
NSERC Award – Summer 2021 & Summer 2018
$7840 value each
- Awarded to undergraduate students to encourage research

The Provost's Honour Roll Medal
McMaster In-Course Award – Fall 2019
- Named to the Provost's Honour Roll
- Achieved GPA of 12 out of 12 (A+) in all courses for Fall and Winter terms

The Dr. Harry Lyman Hooker Scholarship
McMaster In-Course Award – Fall 2019
$1500 value
- Awarded for academic excellence

The Ray Lawson Scholarship
McMaster In-Course Award – Fall 2019
$275 value
- Awarded to the student with the highest average in year three Engineering and Management

The Richard C. Newman Academic Grant
McMaster In-Course Award – Spring 2019
$1500 value
- Awarded for academic excellence

Pollock Family Academic Grant
McMaster In-Course Award – Fall 2017
$2500 value
- Awarded for academic excellence in the first year of Engineering

Undergraduate Academic Research Experience

McMaster Centre for Software Certification (McSCert)
Summer 2021 – Using NSERC USRA
Supervised by Dr. Mark Lawford

- Assisted in Dr. Mark Lawford's publications: "A Domain-Centralized Automotive Powertrain E/E Architecture" and "Making the Case for Centralized Automotive E/E Architectures"

McMaster Motion Simulator Lab
Summer 2018 - Using NSERC USRA

Supervised by Dr. Martin v. Mohrenschildt

Professional Work Experience

Software Engineering Assistant (Co-op)
Spring 2019 – Summer 2020

Magna Electronics Vision Center, Brampton, Ontario

- Developed C++ and Python code for Magna Electronics' machine vision division
- Showed initiative by improving backup camera GUI code beyond required specifications
- Implemented CAN bus communication and UI under tight deadline while on business trip

Certificates

Stanford Online Machine Learning Course Certificate

- Successfully completed the course on the "Coursera" online education platform