Tom Sloan
Computer Systems Engineer
https://github.com/Tom-Sloan || LinkedIn/tom-sloan || www.tom-sloan.com
Willing to relocate

Education

Master of Applied Science in Electrical and Computer Engineering
Thesis: Indoor 3D Modeling Using Consumer Drones and Neural Simultaneous Localization and Mapping (SLAM) for Virtual Reality and a Cloud Architecture
Carleton University, Ottawa
Defending November 25th, 2025

B.Eng. in Computer Systems Engineering (with Distinction)
Carleton University, Ottawa
2022

Papers

T. Sloan, B. Wallace, and R. Goubran, "**System for Drone-Based Indoor Mapping for Augmented Reality**," *in Proc. 2025 IEEE Int. Instrum. and Meas. Technol. Conf. (I2MTC)*, Ottawa, Canada, May 2025, accepted for publication.

T. Sloan, B. Wallace, and R. Goubran, "**Indoor 3D Reconstruction for Augmented Reality Using a Consumer Drone and a Cloud Architecture**," submitted for publication in *Proc. 2025 IEEE Sensors Applications Symposium (SAS)*, July 2025.

Thesis

- Developed a modular, cloud-assisted SLAM framework that enables fully autonomous indoor mapping and navigation with a low-cost consumer drone (DJI Mini 3).
- Developed and compared two distinct SLAM approaches: a traditional visual-inertial system using ORB-SLAM3 with RGB camera and IMU fusion, and a neural SLAM system using SLAM3R that operates with RGB camera data alone.
- Designed a cloud-based architecture using Docker, RabbitMQ, and React.js to offload high-computation tasks (SLAM, 3D reconstruction) to remote servers, achieving near real-time 3D reconstruction at 21.06 frames per second on NVIDIA RTX 4070 Ti.
- Trained the system in a custom Unity-based simulator and validated performance through real-world deployments, achieving trajectory accuracy with 6.61 cm RMSE on the Replica benchmark.
- Enabled high-fidelity map streaming to augmented reality (AR) headsets for on-the-fly visualization and monitoring, demonstrating practical applications for indoor spatial capture.

Independent Projects

Speakeasy, *Google Gemini, ByteDance HLLM, Google Speech-to-Text, React Native, Node.js*
Smart Home, *C, C++, Pytorch, CAD, PCB Design, AWS, Firebase*
Smart Band Project, *C, C++, Python, CAD, PCB Design, AWS, MATLAB*
Portfolio Website, *React, Redux, JavaScript, HTML, Sass*
Twitter Bot, *Python*
These projects and more can be found at www.tom-sloan.com

Work Experience

Researcher, Carleton University *2018-2021 & 2023 to present*

- Engineered contact-based sensor systems using pressure-sensitive mats, embedded sensors, and custom PCBs for real-time physiological monitoring (heart rate, respiration rate, body fluid flow) in older adults, emphasizing low-cost hardware design and continuous data acquisition.
- Deployed multi-modal camera infrastructure integrating LiDAR, thermal imaging, RGB webcams, and privacy-preserving smart cameras for behavioral monitoring in hospital settings, managing time synchronization across heterogeneous sensors and implementing skeletal tracking for privacy compliance.
- Collaborated cross-functionally with faculty, graduate students, and industry partners to synthesize research findings, publish peer-reviewed papers, and guide the continuous improvement of both health-monitoring and UAV-based mapping systems.

DevOps Engineer, Magnet Forensics *2022 – 2023*

- Worked in a small team environment using a variety of Dev-Ops tools including Jenkins, Linux, Python and Powershell to help manage thousands of software builds a day on dozens of on-premise servers.
- Helped with the migration from on-premise to AWS cloud using CloudFormation and EC2 using the knowledge gained from doing AWS Certifications.

Spectrum Engineering Co-Op, Telesat Canada *2020 - 2021*

- Made an alternative user interface and API in python to interact with MATLAB giving the ability to directly use satellite XML data given by the satellite operators without requiring expensive MATLAB add-ons.
- Wrote extensive amounts of tests and code to analysis satellite spectrum use. This allowed the further analysis of various international regulations tests such as regulation 1503 from the International Telecommunication Union

Certifications

AWS Certified Security – Specialty	October 2022
AWS Certified SysOps Administrator – Associate	May 2022
AWS Certified Solutions Architect – Associate	January 2022
AWS Certified Developer – Associate	February 2022
AWS Certified Cloud Practitioner	July 2020
Canadian Securities Course	September 2018