

Sara Hatami

Computer Vision and Robotics Software Developer

📍 Vancouver, CA

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🌐 Scholar Profile

📞 (+1)2508850076

SKILLS

Operating Systems	Microsoft Windows, Ubuntu Linux
Software Dev skills	Python, MATLAB, C/C++, ROS, Git, Docker
Machine Learning	PyTorch, TensorFlow, Pandas, OpenAI Gym, JAX, Flax, OpenCV, Open3D, CNNs, RNNs, Attention, SAM, YOLO
Estimation and Controls	MPC, PID, Extended and Unscented Kalman Filter, Particle Filter, Search Algorithms
Sensors	Inertial Measurement Units (IMUs), LiDARs, Stereo and Mono Cameras
Technical Skills	Robot Control and Navigation, Machine Learning, Reinforcement Learning, Image Processing, Computer Vision, Bayesian Statistics, Multi-view 3D Reconstruction, Geospatial Processing, Mathematical Optimization, Remote Sensing, Optimal Experiment Design

EXPERIENCE

Algorithms, Optimization, and Control Laboratory, University of British Columbia

Oct. 2023 - Present

Graduate Research Assistant

Vancouver, CA

- Developed and implemented feedback control strategies to maximize data informativity for mobile sensing, infrastructure inspection, and machine learning applications.
- Devised and deployed active plume modeling solutions via variational inference of Gaussian mixture models enhanced with transport maps.
- Utilized Bayesian optimization and evolution strategies to implement Python-based, information-theoretic optimal experiment design methods for active robotic data acquisition.

National Research Council Canada

Nov. 2023 - Jan. 2025

Independent Research Contractor

Vancouver, CA (Remote)

- Developed custom training and inference procedures for SAM (segmentation) and Stable Diffusion XL 1.0 (generative inpainting), powering a novel end-to-end target segmentation and anomaly detection pipeline.
- Deployed advanced prompt-based generative models for reconstruction-based anomaly detection of powerline components, achieving 96% ROC-AUC and 98% detection accuracy.
- Created fully automated visual anomaly detection pipelines for powerline insulators using classical image processing methods.

Advanced Control and Intelligent Systems Laboratory, University of Victoria

Jan. 2022 - Aug. 2023

Graduate Research Assistant

Victoria, CA

- Developed a novel unsupervised learning algorithm to assign utilities to various 3D object viewpoints, enhancing their effectiveness in 3D reconstruction.
- Developed a novel reinforcement learning method for aerial imaging view planning that cuts required images for multi-view 3D reconstruction by 70% and lowers 3D reconstruction error by 33.5% compared to the standard approach.
- Designed a multi-task deep learning model for aerial image depth completion and target detection by combining a ResNet-based Faster R-CNN detector (with a Feature Pyramid Network neck) and a ResNet-based autoencoder.

Human and Robot Interaction Laboratory, University of Tehran

Jun. 2020 - Jun. 2021

Research Intern

Tehran, IR

- Programmed a 3Dof Industrial Delta Robot from scratch and implemented various trajectory planning methods including a spline-based trajectory for smooth, high-speed pick-and-place operation.

Robotics Engineering Center (Robome, a.k.a. Tart Robotics)

Jul. 2019 - Jun. 2020

Undergraduate Assistant

Tehran, IR

- Designed and implemented robotic challenges for young robotics learners.

PUBLICATIONS

Bag of Views: An Appearance-Based Approach to Next-Best-View Planning for 3D Reconstruction ([Paper](#), [Code](#))

S. Hatami, F. Dadboud, M. Bolic, I. Mantegh and H. Najjaran. In 2023 IEEE Robotics and Automation Letters (RA-L).

Object Semantics Give Us the Depth We Need: Multi-Task Approach to Aerial Depth Completion ([Paper](#))

S. Hatami, M. Tucsok, I. Mantegh and H. Najjaran. In 2023 IEEE International Conference on Systems, Man, and Cybernetics (SMC).

3D Reconstruction from 2D Images: A Two-part Autoencoder-like Tool ([Paper](#))

M. Tucsok*, S. Hatami*, K. Gupta and H. Najjaran. In 2022 IEEE International Conference on Systems, Man, and Cybernetics (SMC). *Authors share first authorship

EDUCATION

University of Victoria

Victoria, CA

M.A.Sc., Mechanical Engineering (AI and Robotics), GPA: 8.8/9.0

Thesis: Towards an Intelligent Data Acquisition System for UAV-based 3D Reconstruction ([Link](#))

University of Tehran

Tehran, IR

B.Sc., Mechanical Engineering, Minor in Computer Engineering

Thesis: Deep MPC-based Motion Planning of an Omnidirectional Mobile Robot in Unknown Environments