BLERIM ABDULLAI · CURRICULUM VITAE

Blerim Abdullai

GRADUATE STUDENT · COMPUTER SCIENCE

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Education

University of Toronto

MSc Computer Science

- GPA: 4.0/4.0
- · Advisor: Florian Shkurti, Tim Barfoot

University of Illinois

B.S. COMPUTER ENGINEERING (HIGHEST HONORS)

- GPA: 3.92/4.0
- Undergraduate Advisor: Julia Hockenmaier, Alexander Schwing
- Thesis: A System Description For the Kingfisher Simbot (Vision Focus)

College of DuPage

A.S. ENGINEERING SCIENCE (HIGH HONORS)

- GPA: 3.95/4.0
- Relevant Coursework, Machine Learning for Mathematical Optimization, State Estimation, Machine Learning, Deep Learning for Computer Vision, Introduction to Robotics, Mobile Robotics, Algorithms and Models of Computation, Computer Systems Engineering, Digital Systems Lab, Digital Signal Processing, Analog Signal Processing.

Research Experience _____

University of Toronto

ROBOT VISION AND LEARNING LAB

- Developing a custom multi-sensor rig for an autonomous surface vessel, handling all electrical integration, mount design, sensor calibration, and time synchronization using PTP across NavTech radar, Ouster OSO-128 lidar, Oculus m3000d sonar, Starfish sidescan sonar, Teledyne stereo cameras, and post proccessed Novatel GPS for localization dataset publication.
- Developed novel deep learning based localization methods using imaging radar and overhead imagery for an autonomous surface vessel, capable of global localization without GNSS. Outperformed comparable baselines by up to 50% in best-case scenarios and was the first to localize in a marine setting.

Pacific Northwest National Lab

POST BACHELORS RA

- Developed and field tested GPS waypoint following for an autonomous surface vessel for environmental monitoring missions.
- Created an interactive tracker for pedestrians in live video fused across 16 cameras, using Kalman Filters, Deep Association Metrics, and a novel view manager.

University of Illinois - Dept of Computer Science

UNDERGRADUATE RESEARCH ASSISTANT - AMAZON ALEXA PRIZE SIMBOT CHALLENGE

- Competed amongst 10 universities on a team building a multimodal model utilizing a seq2seq transformer, FFNNs, and Mask-RCNN to create collaborative dialog agents within a real-time Alexa deployment.
- Improved the scene understanding of our bot by augmenting the vision dataset, designing evaluation metrics, and training variations of Mask R-CNN, for instance segmentation on AWS EC2 Instances.
- Implemented a dialog manager which uses visual information from current and previous observations to generate clarifying questions for the user to improve task success rate.

Professional Experience _____

JUNE 2025

Toronto, ON Sept 2023 - Sept 2025

Urbana-Champaign, IL May 2021 - May 2023

Glen Ellvn. IL August 2019 - May 2021

> Toronto, ON Sept 2023 - Present

> > Sequim, WA

January 2022 - May 2023

Urbana-Champaign, IL

May 2023 - August 2023

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Caterpillar Inc.

Embedded Software Engineering Intern

- Developed core router features on **production** Engine Control Modules including configurable DHCP server support.
- Supported autonomy team by developing SRT channels for secure low-latency video streams of up to 8 cameras.

Pacific Northwest National Lab

COMPUTER VISION AND EMBEDDED SECURITY INTERN

- Created an automated filtering pipeline for detecting fish near turbines within **passive sonar footage** using Median Filters and Contour Detection algorithms removing 70% of empty frames while detecting 99% of the targets.
- Constructed visualizations for IoT network data to be used with PNNL's CHISSL semi-supervised labeling tool.
- Developed 2 drivers for Z-Wave and ZigBee IoT devices within PNNL's open-source IoT middleware VOLTTRON.

Publications _____

Published

Blerim Abdullai, Tony Wang, Aoran Jiao, Xinyuan Qiao, Florian Shkurti, and Timothy D. Barfoot "RaSCL: Radar to Satellite Crossview Localization" *ICRA Workshop on Field Robotics 2025* (Spotlight talk)

Neeloy Chakraborty, Risham Sidhu, **Blerim Abdullai**, Haomiao Chen, Nikil Ravi, Abhinav Ankur, Devika Prasad, Julia Hockenmaier "BEAST: Building an Embodied Action-prediction System with Trajectory data" *Amazon Science 2023*

UNDER REVIEW

Theodore Nowak, Garrett Staines, **Blerim Abdullai**, "PNNL-TUNAMELT: Towards automating the detection of interactions with marine energy devices using acoustic camera sensors" *Limnology and Oceanography: Methods 2025*

Awards, Fellowships, & Grants _____

2023	CGS-M, NSERC	27,000 CAD
2023	ECE Highest Honors, Awarded to students with a GPA above 3.8 and professor nomination	
2022	ECE 391 Student Kernel Design Competition, Placed 1st among 54 groups.	
2022	UIUC James Scholar, Awarded to students who maintain a GPA of above 3.5.	
2022	Varshney Family Scholarship, ECE Department Scholarship	1,050 USD
2022	Pathways Scholarship, UIUC Grainger Scholarship	5,000 USD
2022	Eta Kappa Nu Member (IEEE HKN), Top 25% of the ECE department.	
2021	High Honors (College of DuPage), Awarded to students graduating with a GPA above 3.6.	
Teaching	Experience	

FA 23	Deep Learning and Neural Networks (CSC 413), Teaching Assistant	UofT
FA 22, SP 23	Computer Systems Engineering (ECE 391), Undergraduate Course Assistant	UIUC
SP 22	Digital Systems Laboratory (ECE 385), Undergraduate Course Assistant	UIUC

Extracurricular Activities_

STUDENT ORGANIZATIONS

Richland, WA

Peoria, IL

June 2021 - January 2022

May 2022 - August 2022

College of DuPage Engineering Club and Robotics Team

President

Glen Ellyn, IL August 2019 - May 2021

- Hosted 10+ STEM outreach events with 250+ underrepresented students, assigned tasks, ran meetings, secured 3 sponsorships with local engineering companies, and managed \$30,000 in club finances.
- Led and designed an outreach project where a user could visit our Node.JS web application and control 3D-printed sumobots via a custom low-latency WebRTC live stream and reverse proxies using Nginx to the ESP8266 Arduinos.
- Developed a Gazebo simulation and embedded systems API using ROS, Real-sense Cameras, NVIDIA Jetson Xavier, I2C, and Teensy for our semi-autonomous robot at the NASA Mining Competition.

Skills_

Programming Languages: Python, C, C++, System Verilog, x86 Assembly, Java, Javascript, Bash

Libraries: PyTorch, GTSAM, OpenCV, Open3D, Tensorflow, NumPy, SciPy, AWS, Node.JS, OpenSSL

Tools: Git, Docker, ROS, AWS, ModelSim, Linux, Nginx, QEMU

Citizenship: United States, Canada