

Harnaik Singh Dhami

dhami@umd.edu

EDUCATION

UNIVERSITY OF MARYLAND

Doctor of Philosophy (Ph.D.) in Computer Science
Specializing in Artificial Intelligence and Robotics
GPA: 3.85

College Park, MD

August 2019-Present

VIRGINIA TECH

Master of Science (M.S.) in Computer Engineering
Specialized in Software and Machine Intelligence
GPA: 3.77

Blacksburg, VA

January 2018-August 2019

VIRGINIA TECH

Bachelor of Science (B.S.) in Computer Engineering
Graduated Cum Laude

Blacksburg, VA

August 2014-December 2017

EXPERIENCE

Robotic Algorithms and Autonomous Systems (RAAS) Lab at University of Maryland

Graduate Research Assistant

College Park, MD

August 2019-Present

- PhD student advised by Dr. Pratap Tokekar
- Utilizing path planning, perception, and machine learning algorithms to solve exploration, inspection, monitoring, and 3D reconstruction tasks with UAV and 3D LiDAR

NASA Jet Propulsion Laboratory via ANRE Technologies Inc.

Intern

Pasadena, CA (Virtual)

January 2021-June 2021

- Interned for 397K – Artificial Intelligence, Observation Planning and Analysis Group
- Helped develop simulation framework for semi-autonomous inspection robot

Central Intelligence Agency

Graduate Fellow

Washington, DC

May 2018-August 2018

- Worked on Android WearOS application development
- Briefed project developments to senior office leadership

Central Intelligence Agency

Graduate Fellow

Washington, DC

December 2017-January 2018

- Continued data modem work from summer 2016

Central Intelligence Agency

Intern

Washington, DC

May 2017-August 2017

- Setup and tested a new configuration of a network system. Presented findings to senior office leadership
- Fixed several malfunctioning network devices for other officers
- Worked with other interns by helping solve some of their project-related problems
- Supported officers in training

Robotic Algorithms and Autonomous Systems (RAAS) Lab at Virginia Tech

Undergraduate Research Assistant

Blacksburg, VA

January 2017-May 2017

- Learned about visual teach and repeat, ROS, and controlling the Husky robot

Central Intelligence Agency

Intern

Washington, DC

July 2016-August 2016

- Obtained TS/SCI clearance
- Worked with the configuration of data modems

TEACHING

University of Maryland

Graduate Teaching Assistant

College Park, MD

August 2020-December 2020

- Worked as a teaching assistant for the Computer Science Course CMSC818B: Decision Making for Robotics

Virginia Tech

Graduate Teaching Assistant

Blacksburg, VA

January 2018-May 2019

- Worked as a teaching assistant for the Master of Information Technology Course ECE5484: Fundamental Computer Systems

CONFERENCE PUBLICATIONS

Pred-NBV: Prediction-guided Next-Best-View Planning for 3D Object Reconstruction

- **Harnaik Dhami**, Vishnu Dutt Sharma, and Pratap Tokekar
- *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023

GATSBI: An Online GTSP-Based Algorithm for Targeted Surface Bridge Inspection

- **Harnaik Dhami**, Kevin Yu, Troi Williams, Vineeth Vajipey, and Pratap Tokekar
- *International Conference on Unmanned Aerial Systems (ICUAS)*, 2023

Intermittent Deployment for Large-Scale Multi-Robot Forage Perception: Data Synthesis, Prediction, and Planning

- Jun Liu, Murtaza Rangwala, Kulbir Ahluwalia, Shayan Ghajar, **Harnaik Dhami**, Pratap Tokekar, Ben Tracy, and Ryan Williams
- *IEEE Transactions on Automation Science and Engineering (TASE)*, 2022

Intermittent Deployment for Large-Scale Multi-Robot Forage Perception: Data Synthesis, Prediction, and Planning

- Murtaza Rangwala, Jun Liu, Kulbir Ahluwalia, Shayan Ghajar, **Harnaik Dhami**, Pratap Tokekar, Ben Tracy, and Ryan Williams
- *MDPI Agronomy*, 2021

Crop Height and Plot Estimation for Phenotyping from Unmanned Aerial Vehicles using 3D LiDAR

- **Harnaik Dhami**, Kevin Yu, Tianshu Xu, Qian Zhu, Kshitiz Dhakal, James Friel, Song Li, and Pratap Tokekar
- *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2020

WORKSHOP PUBLICATIONS

Pred-NBV: Prediction-guided Next-Best-View Planning for 3D Object Reconstruction

- **Harnaik Dhami**, Vishnu Dutt Sharma, and Pratap Tokekar
- *Robotics: Science and Systems (RSS) Workshop: Robot Representations for Scene Understanding, Reasoning, and Planning*, 2023

Pred-NBV: Prediction-guided Next-Best-View Planning for 3D Object Reconstruction

- **Harnaik Dhami**, Vishnu Dutt Sharma, and Pratap Tokekar
- *Robotics: Science and Systems (RSS) Workshop: Inference and Decision Making for Autonomous Vehicles*, 2023

PRESENTATIONS

Using UAV Mounted 3D LiDAR to Estimate Plant Height

- **Harnaik Dhami**, Kevin Yu, Tianshu Xu, Qian Zhu, Kshitiz Dhakal, James Friel, Song Li, and Pratap Tokekar
- *International Conference on Digital Technologies for Sustainable Crop Production (DIGICROP)*, 2020

Autonomous Crop Height Estimation and Navigation using an Unmanned Ground Vehicle in Row-based Farmlands

- Tianshu Xu, **Harnaik Dhami**, Song Li, and Pratap Tokekar
- *Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping V*, 2020

Using UAV Mounted 3D LiDAR to Estimate Plant Height

- **Harnaik Dhami**, Kevin Yu, Tianshu Xu, Qian Zhu, Song Li, and Pratap Tokekar
- *Do Good Robotics Symposium*, 2019

ACTIVITIES

Residential Leadership Community

Resident

Blacksburg, VA

August 2014 – May 2014

- Living/learning community that promotes leadership, public speaking, and teamwork

SKILLS

Programming

- Advanced knowledge in ROS, C, C++, and Python
- Network programming with sockets (TCP and UDP)

Advanced Linux Knowledge

- Command line interfacing, shell scripts, and reconfiguring Linux to be used on an embedded device

General Amateur Radio License