Harnaik Singh Dhami

dhami@umd.edu

EDUCATION

UNIVERSITY OF MARYLAND — **College Park, MD**
Doctor of Philosophy (Ph.D.) in Computer Science — August 2019-Present
Specializing in Artificial Intelligence and Robotics
GPA: 3.85

VIRGINIA TECH — **Blacksburg, VA**
Master of Science (M.S.) in Computer Engineering — January 2018-August 2019
Specialized in Software and Machine Intelligence
GPA: 3.77

VIRGINIA TECH — **Blacksburg, VA**
Bachelor of Science (B.S.) in Computer Engineering — August 2014-December 2017
Graduated Cum Laude

EXPERIENCE

Robotic Algorithms and Autonomous Systems (RAAS) Lab at University of Maryland — **College Park, MD**
Graduate Research Assistant — 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. — **Pasadena, CA (Virtual)**
Intern — 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 — **Washington, DC**
Graduate Fellow — May 2018-August 2018

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

Central Intelligence Agency — **Washington, DC**
Graduate Fellow — December 2017-January 2018

- Continued data modem work from summer 2016

Central Intelligence Agency — **Washington, DC**
Intern — 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 — **Blacksburg, VA**
Undergraduate Research Assistant — January 2017-May 2017

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

Central Intelligence Agency — **Washington, DC**
Intern — July 2016-August 2016

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

TEACHING

University of Maryland **College Park, MD**
Graduate Teaching Assistant August 2020-December 2020

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

Virginia Tech **Blacksburg, VA**
Graduate Teaching Assistant 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*

DeepPaSTL: SpatioTemporal Deep Learning Methods for Predicting Long-Term Pasture Terrains using Synthetic Datasets

- Murtaza Rangwala, Jun Liu, Kulbir Ahluwalia, Shayan Ghajar, **Harnaik Dhami**, Ben Tracy, Pratap Tokekar, 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 **Blacksburg, VA**
Resident 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