Sauranil Debarshi

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EDUCATION

Indian Institute of Information Technology Guwahati - IIITG *Guwahati, India*
Cumulative GPA: 7.39/10.0 August 2015 - May 2019
Junior + Senior year GPA: 8.31/10.0
B.Tech in Electronics and Communication Engineering

Maharishi Vidya Mandir Silpukhuri *Guwahati, India*
Percentage: 89.0% 2013 - 2015
Senior Secondary School

Delhi Public School ONGC Nazira *Nazira, India*
CGPA: 10.0/10.0 2011 - 2013
Secondary School

RESEARCH INTEREST

Autonomous vehicles, robotics, and intelligent control (Research Profile: Google Scholar)

RESEARCH EXPERIENCE

Project Assistant December 2019 - June 2021
Wipro IISc Research Innovation Network (WIRIN), Indian Institute of Science, Bangalore (IISc)
Advisor: Prof. Suresh Sundaram

- Developed a 16-DOF mathematical model of an ego-vehicle as part of a high fidelity autonomous vehicle (AV) simulator. The sub-modules of the vehicle were written in MATLAB and python for integration with Unreal Engine.
- Proposed an online learning adaptive controller to improve cruise control and path-tracking in autonomous vehicles. The developed method rejects external disturbances and parametric uncertainties, and significantly improves the tracking performance.

Research Assistant August 2019 - December 2019
Collaborative Robotics Lab (CORAL), Indraprastha Institute of Information Technology, Delhi
Advisor: Dr. P. B. Sujit

- Proposed a battle damage assessment (BDA) algorithm for optimizing coalition formation in multi-UAV systems. The project is to form UAV teams to execute search-and-prosecute missions. The developed algorithm minimizes mission completion time and resource requirement with a minimum number of coalitions.
- Implemented a multi-UAV person re-identification network using wireless mesh networking. The project is to identify a person of interest on-board a UAV node and share the information through the network such that another UAV can re-identify the target.

Research Intern May 2018 - December 2018
Collaborative Robotics Lab (CORAL), Indraprastha Institute of Information Technology, Delhi
Guide: Dr. P. B. Sujit

- Created a wireless mesh network (WMN) using stationary/mobile ground nodes and UAVs for establishing communication in various disaster scenarios. It provides a complete end-to-end architecture, where an android application is deployed on smartphones at the user-end, the WMN

comprising of the multifarious nodes, and a graphical user interface (GUI) at a base station to facilitate situational awareness. Developed a software framework based on ROS that acts as the backbone for relaying user information from the app to the base station through the nodes.

Undergraduate Researcher January 2018 - April 2019
Guide: Mohd. Mansoor Khan, Lecturer, Dept. of ECE, IIITG

- Studied and developed a fully-functional low-cost, portable LED-Spectrophotometer that measures and detects sugar, nitrite and blood in urine.

PUBLICATIONS & PREPRINTS

- **S. Debarshi**, S. Sundaram, and N Sundararajan, "Robust EMRAN based Neural Aided Learning Controller for Autonomous Vehicles." *arXiv preprint arXiv:2106.11716 (2021).* [Link] - ***Submitted to Engineering Applications of Artificial Intelligence (EAAI)***
- N. Roy and **S. Debarshi**, "UAV-based Person Re-Identification and Dynamic Image Routing using Wireless Mesh Networking," 2020 7th International Conference on Signal Processing and Integrated Networks (SPIN), Noida, India, 2020, pp. 914-917, doi: 10.1109/SPIN48934.2020.9071078. [Link]
- N. Roy, **S. Debarshi**, and P. B. Sujit (2020). "ROSNet: A WMN based Framework using UAVs and ground nodes for Post-Disaster Management." [Link] - ***Accepted at IEEE HTC 2021***
- **S. Debarshi** and M. M. Khan, "Portable and low-cost LED based Spectrophotometer for the Detection of Nitrite in simulated-Urine," 2019 International Conference on Electrical, Electronics and Computer Engineering (UPCON), ALIGARH, India, 2019, pp.1-4. [Link]

TECHNICAL SKILLS

Programming Languages	Python, MATLAB, C++, C
Frameworks and Simulators	ROS, Gazebo, CARLA, AirSim, Rviz
Libraries	scikit-learn, OpenCV, rospy

ACHIEVEMENTS

- Best paper award, IEEE UPCON 2019.
- Best undergraduate research project, ECE Dept, IIITG, 2018.
- Project shortlisted in top 100 submissions, 5G Hackathon 2020, Govt. of India.
- Top 10 in Rackathon 2021 out of 108 teams.
- Third state rank, International Olympiad of Mathematics, 2013.

EXTRA-CIRRUCULAR

- Team leader of IIITG's table tennis team; Silver Medalist at the 2016 All India Inter-IIIT Sports Competition.
- Part of the soccer team that won the silver medal at the Inter-IIIT Sports Competition 2016.
- Gold medalist in table tennis at the annual sports event of IIITG 2016, 2018, 2019; Silver medalist in 2017.