

RESEARCH INTERESTS

Multidisciplinary combination of Artificial Intelligence, Machine Learning and Robotics,

EDUCATION

- **University of Petroleum and Energy Studies, Dehradun** Uttarakhand, India
Bachelor of Technology (B.Tech.), Computer Science and Engineering *Aug. 2020 – Present*
- **Sacred Heart Convent Sr. Sec. School, Jagadhri** Haryana, India
High School *2017 – 2019*

PUBLICATIONS

- **Jaskirat Singh***, Neel Adwani*, Harikumar Kandath, K. Madhava Krishna. RHFSafeUAV: Real-Time Heuristic Framework for Safe Landing of UAVs in Dynamic Scenarios. In *International Conference on Unmanned Aircraft Systems (ICUAS), 2023*. [[Project Page](#)]
- Kushagra Srivastava, Dhruv Patel, Aditya Kumar Jha, Mohhit Kumar Jha, **Jaskirat Singh**, Ravi Kiran Sarvadevabhatla, Pradeep Kumar Ramancharla, Harikumar Kandath, and K. Madhava Krishna. UAV-based Visual Remote Sensing for Automated Building Inspection. In *European Conference on Computer Vision (ECCV) - CVCIE Workshop, 2022*. [[Project Page](#)]

* indicates equal contribution

RESEARCH EXPERIENCE

- **Human-Computer Interaction Lab, University of New Brunswick** Fredericton, Canada
Research Assistant/Visiting Researcher *Oct 2022 - May 2023*
 - **Encouraging Flow State in Teleoperated Robot Navigation**
Advised by: [Dr. Daniel J. Rea](#)
 - * Worked on improving Human-Robotics Interaction methods during navigation
 - * Developed novel approach for assisting teleoperated robots while authoring micro challenges.
 - * Developed methods for detecting the breakage of flow in navigation.
 - * Developed a module to detect boredom from joystick inputs while operation.

Keywords: *Human-Robotics Interaction, Robotics, Navigation, Flow*
- **Robotics Research Center, IIIT-Hyderabad** Hyderabad, India
Research Assistant *May 2022 - Mar 2023*
 - **Safe Landing of UAVs in Dynamic Scenario**
Advised by: [Dr. Harikumar Kandath](#), and [Dr. Madhava Krishna](#)
 - * Developed novel architecture for safe landing of UAV in dynamic scenarios, by estimating through different parameters.
 - * Worked on identifying suitable landing potential landing zones through state estimation.
 - * Developed an open source framework for safe landing of UAVs that can be embedded into any microprocessors.
 - **UAV-based Visual Remote Sensing Automated Building Inspection**
Advised by: [Dr. Madhava Krishna](#), [Dr. Harikumar Kandath](#), and [Dr. Ravi Kiran Sarvadevabhatla](#)
 - * Worked on automating the inspection of buildings through UAV-based image data collection and a post-processing modules to infer and quantify the details with the help of computer vision.
 - * Worked on developing the architecture for estimating the distance between adjacent buildings and structures with the help of drone based technique.
 - * Developed and curated a dataset from UAV, comprising of various building rooftop and civil-structure evidences.
 - * Developed roof-area estimation techniques through UAV.

Keywords: *Aerial Robotics, Autonomous UAVs, Computer Vision, Deep Learning*

• **Robotics Research lab, UPES**

Uttarakhand, India

Undergraduate Researcher

Feb 2022 - May 2022

◦ **Autonomous Terrestrial Robot Localization, and Map-building**

Advised by: [Dr. Ashish Karn](#)

- * Worked on cost-effective optimised approach
- * Developed an algorithmic method based on ultrasonic sensors that can be used for localization, and map-building of a Terrestrial Robot.

Keywords: *Terrestrial Robot, Localization, Map-building, Obstacle Avoidance*

• **Network Research Lab, IIIT-Delhi**

New Delhi, India

Research Intern

May 2021 - Aug 2021

◦ **Scalable Vehicle Detection on Edge Devices**

Advised by: [Dr. Arani Bhattacharya](#)

- * Explored various computer vision techniques that could help in computing optimised cost.
- * Developed techniques to run and find latency of Yolo variants on Jetson Nano, and Raspberry Pi 4, and Raspberry Pi Pico.
- * Developed methods to reduce latency of network layers, while exploring GPUs and CPU based machines.

Keywords: *Computer Vision, YOLO, Latency, Jetson Nano, Raspberry Pi Devices*

WORK EXPERIENCE

• **Mattermost Inc.**

Remote

Community Manager Contractor

Mar 2022 - Feb 2023

◦ **Research Product Documentation Team:**

- * Helping them maintaining docs for end-users.
- * Developed research estimation product strategies for Mattermost Documentation.

Keywords: *Research, Technical Writing, Community Management*

• **The Linux Foundation**

Remote

Project Administrator - CommunityBridge Mentorship (Codeuino)

Aug 2020 - Jan 2021

◦ **Codeuino Mentorship:**

- * Mentored 3 interns on social networking platform project
- * Worked as community liason and coordinated program for Codeuino, organizing task, and evaluations.

Keywords: *Social Networking Platform, Nodejs, React, Project Design, Open Source*

• **Google Season of Docs**

Remote

Research Technical Writer

Jun 2020 - Dec 2020

◦ **CHAOSS Project (under The Linux Foundation)**

- * Developed and wrote [CHAOSS Community-handbook](#).
- * Developed strategies for the documentation and interviewed different core people to write CHAOSS history.

Keywords: *GSoD, Community Handbook, Technical Writing, Research, Open Source*

• **Google Summer of Code**

Remote

Mentor and Org Administrator

Jan 2018 - Sep 2021

◦ **SugarLabs Community (in 2018)**

- * Worked as a Mentor in "[Interactive Exercises for Turtle Blocks](#)", and "[Beginner's Guide, Developer's Dashboard with Sugarbot](#)" project.

◦ **SugarLabs Community and Jboss Community (in 2019)**

- * Worked as Mentor in "[Create a Sugar Dashboard](#)" project.
- * Worked as an Org Administrator for the Codeuino community under the umbrella org, Jboss Community and mentored "[Development of modules with new UI/UX](#)" project.

- **SugarLabs Community and Terasology Foundation (in 2020)**
 - * Worked as a Mentor in "Music Blocks Javascript Export" project.
 - * Worked as an Org Administrator for the Codeuino community under the umbrella org, Terasology Foundation and mentored "Development of Admin Management mechanism for DONUT, and Proposal Functionality in Donut project.

Keywords: *GSoC, Javascript, Turtle Blocks, Nodejs, Python, Data, Social Networking Platform, Open Source*

Google-Code In

Remote

• *Community Project Lead and Mentor*

Sep 2020 - Jan 2020

- **SugarLabs (in 2017, 2018), Jboss Community (in 2018), and Terasology Foundation (in 2019):**
 - * Worked as a project maintainer, created tasks related to coding, research, documentation, and design, ensuring proper evaluation of mentors and students.
 - * Recognized any conflicts of interest, interpersonal issues, and replaced as necessary & ensure adequate & appropriate mentoring coverage within the community.

Keywords: *GCI, Open Source, Community Management*

PROJECTS

- **Framework for Safe Landing of UAVs in Dynamic-Scenarios**

[\[Code\]](#) [\[Research Paper\]](#) [\[Project Page\]](#)

- * Developed safe landing framework for multi-rotor unmanned aerial vehicles in dynamic scenarios, that can be installed in any companion computer, as long as it contains a GPU.
- * Explored various computer vision techniques and integrated canny edge detection.
- * Developed an area estimation algorithm for that showed greater improvement over all the existing work with the error of less than 2%.
- * Wrote the research paper for novel approaches.

Keywords: *UAV, Robotics, Computer Vision, Deep Learning, EdgeML*

- **UAV-based Visual Remote Sensing Automated Building Inspection**

[\[Code\]](#) [\[Research Paper\]](#) [\[Project Page\]](#)

- * Developed and curated a dataset from UAV, comprising of various building rooftop and civil-structure evidences.
- * Explored roof-area and roof layout estimation techniques.
- * Worked on developing the modules in the form of library for automated building inspection.
- * Wrote the research paper for novel approaches.

Keywords: *UAV, Robotics, Computer Vision, Deep Learning*

- **Autonomous Terrestrial Robot Localization, and Mapping**

[\[Code\]](#) [\[Project Report\]](#)

- * Developed algorithm for mapping, and localization of a terrestrial robot
- * Explored Ultrasonic Sensors and developed techniques to collect data for obstacle avoidance, making it cost-effective.

Keywords: *Turtle Bot, Robotics, Localization, Mapping*

SKILLS

- **Relevant Courses:** Principle of Programming Languages, Introduction to Artificial Intelligence, Design and Analysis of Algorithm , Computer Graphics, Machine Learning, Application of Machine Learning in Industries, Operating Systems, Computer System Architecture, Introduction to Robotic Systems, Pattern Recognition and Anomaly Detection, and Cognitive Analytics
- **Languages:** Python, C++
- **Tools & Technologies:** NumPy, Pandas, Matplotlib, Sci-kit Learn, Git, MySQL
- **Platforms:** Linux, Web, MacOS, Windows, Raspberry Pi, Raspberry Pi Pico, Jetson Nano, PixHawk

ACHIEVEMENTS AND AWARDS

- **University Scholarship Scholar:** Awarded 100% scholarship for academics, accommodation, food, and miscellaneous for 4 years of B.Tech at University of Petroleum and Energy Studies (currently studying) based upon the achievements availed.
- **Google Open Source Peer Bonus Award:** Googler nominates external people who have made exceptional contributions to open source projects that are used by Google and awards the recognition.
- **Linux Foundation Travel Grant:** Awarded full scholarship of \$2500 to attend Open Source Summit Europe Conference, Lyon, France 2020.
- **Google Open Source Travel Grant for GSoC:** Awarded full scholarship for travelling and attending the Google Summer of Code Mentor Summit, USA as a part of mentorship done.
- **Microsoft Educator Community Influencer:** Awarded for excellence education community influence on students and teachers, introducing about research technologies.