

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.