



Anup Karekar

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Home: Kolhapur (India)

PUBLICATIONS

[2025]
Pulsar Detection from Imbalanced Datasets Using Hybrid 3-layer Model Without Artificial Class Balancing
(Under Review) - Anup Karekar* - Astronomy and Computing

[2025]
Galaxy Classification Using Edge Segmentation and Convolutional Neural Networks
(In Preparation) - Anup Karekar* Dr. Rajiv Vhatkar* - Shivaji University, Kolhapur/

WORK EXPERIENCE

Research Intern

Deep Space Initiative [04/06/2024 – Current]

City: Colorado | Country: United States

Mobile Asteroid Mining and Processing Unit (MAMPU): Developing a mobile, robotic asteroid mining and processing unit for efficient in-situ resource utilization (ISRU) on near-Earth asteroids.

Project Team Head

Colorado Space Grant Consortium [10/2022 – Current]

City: Colorado | Country: United States

Leading a team in the Great Lunar Expedition, we are currently deploying LunaSat at the lunar South Pole to study magnetic, thermal, and electrostatic properties, track seismic events, and analyze the effects of gravity and sunlight on the Moon's surface, enhancing our understanding of its environment and geology.

Summer Research Student

Green Bank Observatory [10/2023 – 12/2023]

City: West Virginia | Country: United States

Project aims for orbit detection and determining the PB from the variation of spin period of PSR J0437-4715 pulsar using the ATNF Catalog

Research Student

Instituto de Astrofísica e Ciências do Espaço (IA), Portugal [07/2022 – 08/2022]

City: Porto | Country: Portugal

Conducted the MOSFIRE Deep Evolution Field (MOS DEF) Survey, performing rest-frame optical spectroscopy on approximately 1500 H-selected galaxies within the redshift range of 1.37 to 3.80.

EDUCATION AND TRAINING

Diploma in Quantum Computing & Programming (QBronze)

Womanium Global Quantum + AI Program [06/06/2024 – Current]

City: Remote | Website: <https://womanium.org/Quantum/AI>

Teaching Assistant

Rajaram College [07/2022 – Current]

City: Kolhapur | Country: India

Master in Science

Institute of Science [12/2020 – 06/2022]

City: Mumbai | Country: India | Final grade: 9.1 | Thesis: Deep Learning and Computer Vision-Based Detection of Active Galactic Nuclei in the NGC 6946 Galaxy

Bachelor in Science

Rajaram College [06/2017 – 04/2020]

City: Kolhapur | Country: India | Final grade: 76% | Thesis: Comprehensive Analysis of the Supernova Remnant CAS-A Using SAOImage DS9: Expansion Rate, Spectroscopic Analysis, and Classification

DIGITAL SKILLS

Programming Skills

Python-Programming / Machine Learning / Computer vision / Deep Learning - AI - ANN - DNN / Deep Neural Networks (CNNs, GANs) / Digital Image Processing

PROJECTS

[01/07/2024 – Current]

LunaSat Lunar South Pole Environmental Monitoring and Seismic Analysis

- Simulated and analyzed temperature variations replicating the lunar South Pole's geography in a laboratory to study the thermal properties of lunar regolith.
- Designed and implemented algorithms to detect and differentiate between meteor impacts and lunar quakes using high-precision accelerometers in a controlled lab environment.
- Led a research project simulating and analyzing moonquake wave propagation to explore lunar geophysics, utilizing parameters like frequency, depth, and seismic wave velocity.
- Conducted numerical simulations, developed 3D visualizations, and optimized computational models to enhance understanding of lunar seismic activity and its interaction with geological layers.

Link: <https://github.com/KarekarAnup/LunaSat-Lunar-South-Pole-Environmental-Monitoring-and-Seismic-Analysis>

[04/2024 – 05/2024]

Near-Earth-Object Analysis and Impact Risk Assessment Project

Applied data mining techniques to analyze NEO datasets, classify risk levels, and contribute to planetary defense strategies and impact mitigation.

Link: <https://github.com/KarekarAnup/Near-Earth-Object-Classification>

CONFERENCES AND SEMINARS

[02/12/2024 – 04/12/2024] Raman Research Institute, Bangalore, India

ASI Symposium : Astronomy from Moon in the era of Indian lunar missions

[08/2023 – 08/2023]

India-Japan Science and Technology Conclave: International Conference on Frontier Areas of Science and Technology.

Presented a research study on the exploration of NGC6946 leveraging advanced methodologies in computer vision and deep learning algorithms for the detection of Active Galactic Nuclei (AGN).

[01/2023 – 01/2023]

Research Poster Presentation – Avishkar Competition University Level Competition

Delivered a research presentation on the project focused on Stellar Classification utilizing spectral data sourced from the SDSS (Sloan Digital Sky Survey) catalog.

SUMMER SCHOOL, WINTER SCHOOL, CERTIFICATION

[11/2023 – 12/2023]

Womanium Scholarship for the Global Quantum Program 2023

[08/2023 – 10/2023]

Exo-Planets: A Short Course on Planets Orbiting Stars Other than the Sun, Pune Knowledge Cluster, 2023

[12/2021 – 01/2022]

SOKENDAI Asian Winter School 2022, National Astronomical Observatory of Japan, 2022

[08/2022 – 09/2022]

PyHEP Workshop 2022, Hep Software Foundation, 2022

[06/2022 – 07/2022]

Particle Acceleration in Astrophysical Objects, Astronomical Observatory of Rome, 2022

[08/2020 – 09/2020]

Online Workshop on High-Performance Computing for Astronomy and Astrophysics, Indian Institute of Technology, Kharagpur, 2020