ROBIN JACOB ROY

Pioneering Researcher in Deep Learning and Computer Vision | Ph.D. Candidate

robinjacobroy1@gmail.com (+91) 8113980670 Kerala, India robinjacobroy.github.io
github.com/robinjacobroy linkedin.com/in/robin-jacob-roy orcid.org/0000-0003-3001-4692

RESEARCH EXPERIENCE

Machine Learning Research Scholar

airis4D

June 2019 – September 2023 Thelliyoor, Kerala

- Developed an innovative Semantic Segmentation algorithm for extracting protein particles from cryo-electron photomicrographs, enhancing protein particle resolution beyond existing standards. This accomplishment led to the publication of India's first research paper on cryoEM structural biology methodologies.
- Automated protein particle labeling in cryo-electron micrographs, eliminating the need for manual clicking process that typically consume hours of human labor, is achieved in mere seconds with the assistance of interactive sliders, dramatically reducing time and effort expended.
- Implemented YOLO Deep Learning algorithm for swift and accurate species identification of Odonata within photographic images.
- Developed a Convolutional Neural Network (CNN) based Computer Vision model for activity recognition of Drosophila melanogaster from observational video feeds.
- Contributed to the development of a U-Net based Semantic Segmentation algorithm tailored for precise delineation of tree canopies in satellite imagery.

Machine Learning Intern

Santhom Computing Facility

June 2018 – June 2019 Kozhencherry, Kerala

- Crafted Image processing algorithms for species identification of freshwater fishes from underwater camera footage.

PUBLICATIONS AND PRESENTATIONS

- Blesson George, Anshul Assaiya, **Robin Jacob Roy**, Ajit Kembhavi, Radha Chauhan, Geetha Paul, Janesh Kumar, Ninan Sajeeth Philip. *"CASSPER is a semantic segmentation-based particle picking algorithm for single-particle cryo-electron microscopy"*. ***Communications Biology - Nature*** (February 2021).

Conference Proceedings:

- **Robin Jacob Roy**, Ligi Cherian, Ninan Sajeeth Philip. "Image Enhancement using Deep Learning GAN" at the National Seminar, NSAMAP-2023, organized by St. Thomas College Kozhencherry (January 2023).
- Geetha Paul, **Robin Jacob Roy**, Gigi K Joseph, Ninan Sajeeth Philip. "Classification and Quantification of Odonata Biodiversity using Machine Learning Methods". SciCon Series - 3rd International Conference 'In Sync - With Next Generation Biosciences (INGB)-2019' (November 2019).
- ***Poster Presentation:*** **Robin Jacob Roy**, Geetha Paul, Ninan Sajeeth Philip. "Automated Feature Extraction and Classification of Odonates" at the National Seminar, SIAP-2019, organized by Govt. Women's College, Thiruvananthapuram (October 2019).

SKILLS

Deep Learning | Tensorflow | Keras | PyTorch | Machine Learning | OpenCV | Python | Scikit-Learn | Scipy | Pandas | Numpy | Matplotlib | C++ | SQL | Git | LaTeX | Vim

EDUCATION

Ph.D. in Physics (Ongoing)

University of Kerala, Thiruvananthapuram, Kerala

2021 - PRESENT

Thesis: **Multispectral Image Analysis using Machine Learning Techniques.**
Supervisor: Dr. Ligi Cherian.

M.Phil. in Physics

Mahatma Gandhi University, Kerala

2018 - 2020 CGPA: 8.2/10.0

Dissertation: **Automated Identification of Physical Properties of an Object for its Classification based on Machine Learning Methods.**
Advisor: Dr. Ninan Sajeeth Philip.

M.Sc. in Physics

Mahatma Gandhi University, Kerala

2015 - 2017 CGPA: 2.85/4.0

Project: **Classification of Transients Using Machine Learning Methods.**

B.Sc. in Physics

Mahatma Gandhi University, Kerala

2012 - 2015 CGPA: 3.20/4.0

Specialization: **Astronomy and Astrophysics.**

TALKS

- Talk on "Artificial Intelligence and its Opportunities" at 'Sastrapadham: a Science Enrichment residential camp', organized by Samagra Shiksha, Kerala (2 February 2020).
- Talk on "Automated Feature Extraction and Classification of Odonates" at One-day Science Seminar, Pavanathma College, Murickassery (3 January 2020).

CERTIFICATIONS

- Diploma in Computer Assembling and Maintenance (UGC).
- Online Distance Learning Certificate on “Machine learning to Deep Learning: A journey for remote sensing data classification” - Indian Institute of Remote Sensing (IIRS), Indian Space Research Organization (ISRO).
- Geodata Processing using Python - Indian Institute of Remote Sensing (IIRS), Indian Space Research Organization (ISRO).
- Generative Adversarial Networks (GANs) Specialization - Coursera.
- Natural Language Processing in TensorFlow - Coursera.
- Convolutional Neural Networks in TensorFlow - Coursera.
- Python Data Structures - Coursera.

HONORS & AWARDS

- Best Paper Presentation Award for the work “Image Enhancement using Deep Learning GAN” at the National Seminar, NSAMAP-2023, organized by St. Thomas College Kozhencherry (January 2023).
- Best Poster Presentation Award for the Poster “Automated Feature Extraction and Classification of Odonates” at the National Seminar, SIAP-2019, organized by Govt. Women’s College, Thiruvananthapuram (October 2019).

TEACHING EXPERIENCE

- Lecturer (Ad-hoc) in Biophysics: Muthoot Nursing College, Pathanamthitta (November 2023 - February 2024).
- Python Instructor: M.Phil Physics, St. Berchmans College, Chenganacherry (October - November 2021).
- Python Instructor: M.Sc. Physics, St. Berchmans College, Changanacherry (October 2020 - January 2021).
- Python Instructor: M.Phil Physics, St. Berchmans College, Chenganacherry (August 2020).
- Course Instructor: Add-on Course: Real World Applications in Python, CMS College, Kottayam (November 2019).
- Course Instructor: Certificate Course in Computer Assembling and Maintenance, Santhom Computing Facility, St Thomas College, Kozhencherry (August - October 2015).