

# ROBIN JACOB ROY

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

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## RESEARCH EXPERIENCE

### Machine Learning Research Scholar

airis4D

📅 June 2019 – September 2023 📍 Thelliyoor, Kerala

- Automated protein particle labeling in cryo-electron micrographs using Python and OpenCV, eliminating the need for manual clicking and significantly reducing time and effort.
- Designed and implemented an Odonata detection algorithm using the YOLO architecture.
- Developed Computer Vision model for activity recognition of *Drosophila melanogaster* using Convolutional Neural Network(CNN).
- Contributed to the development of a 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

- Developed Image processing algorithms for species identification of freshwater fishes from underwater camera feeds.

## 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).
- Geetha Paul, Blesson George, Linn Abraham, **Robin Jacob Roy**, Ninan Sajeeth Philip. "Preliminary classification of fish fauna in Western Ghats using machine learning tools". SciCon Series on 'Research Interventions and Advancements in Life-science (RIAL)-2018' (August 2018).
- 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', organised 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

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- 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

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- 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

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- Lecturer (Ad-hoc) in Biophysics: Muthoot Nursing College, Pathanamthitta (November 2023 - present).
- Python Instructor: M.Phil Physics, St. Berchmans College, Chenganacherry (October - November 2021).
- Python Instructor: MSc. 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).