

NIRANJAN RAJESH

(+91) 6379 286 963 | niranjnrajesh02@gmail.com | [Personal Website](#) | [Research Blog](#)

EDUCATION

Ashoka University

Postgraduate Diploma in Advanced Studies (DipASR)

Haryana, India

Aug 2023 – May 2024

- Advanced Major in Computer Science
- **Capstone Thesis:** Understanding CNN Behaviour through Neural Manifolds

Bachelor of Science (Hons.) in Computer Science

Aug 2020 – May 2023

- **GPA:** 3.88 out of 4.00 (Magna Cum Laude)
- Additional Coursework in Biology, Neuroscience and Mathematics

RESEARCH POSITIONS

Research Assistant | Centre for Neuroscience, Indian Institute of Science, Bangalore

July 2024 - Present

Advisor: Prof. SP Arun

- Investigated the emergence of brain-like phenomena in DNNs using internal network activations and by varying architecture, training data and regime
- Currently studying the contribution of neural visual representations to aesthetic value judgement through a behavioral study of 100+ online participants

Visiting Undergraduate Researcher | Birla Institute of Technology and Science (BITS) Pilani

May 2023 - July 2024

Advisor: Prof. Venkatakrishnan Ramaswamy

- Designed and carried out computational experiments to investigate causal relationships between internal representational geometry of deep networks and their behaviour
- Observed and documented link between class activation manifold dimensionality of networks and their adversarial robustness

Undergraduate Research Assistant | Mphasis Labs, Ashoka University

May 2022 - January 2023

Advisor: Prof. Subhashis Banerjee

- Developed a suite of deep learning models to perform fine-grained cancer detection and quantification in biopsy slides
- Proposed and led design of novel active learning pipelines and sibling-network architectures to overcome the dataset problems of limited data and class overlap

Undergraduate Research Intern | Computer Science Department, Ashoka University

May 2021 - August 2022

Advisor: Prof. Debayan Gupta

- Designed an implicit-memory based authentication system based on cognitive psychology
- Conducted behavioural experiments on over 120 participants to evaluate the effect of visual and auditory stimuli on extent of implicit learning in the system
- Published and presented work in the AAI-22 Student Abstract and Poster Program, Vancouver

WORK EXPERIENCE

Undergraduate Teaching Assistant

Jan 2022 – May 2024

Computer Science Department, Ashoka University

Haryana, India

- Worked closely with instructors to teach the following Computer Science courses:
 - * CS-1101 Introduction to Computer Programming (Spring 2022)
 - * CS-1203 Data Structures (Monsoon 2022)
 - * CS-1390 Introduction to Machine Learning (Monsoon 2023)
 - * CS-2385 Natural Language Processing (Spring 2024)
- Conducted weekly office hours, discussion and tutorial sessions for course students
- Crafted course curricula, created problem sets and graded coursework
- **Student Feedback: 4.7/5.0 (387 students)**

Full Stack Web Developer

Sep 2020 – Jan 2022

Beyond Design Studio

Tamil Nadu, India

- Served as lead developer for 6 client organisations and their application requirements
- Engineered mobile and web applications using JavaScript-stacks while collaborating closely with visual design and UI/UX departments

PAPERS & PRESENTATIONS

Rajesh, N., Jacob, G., Arun, SP. *Brain-like emergent properties in deep networks*

Conference Paper: Under Review [[preprint](#)]

Rajesh, N., Ramaswamy, V., Gupta, D. *Understanding CNN Behavior through Class Activation Manifolds.*

Undergraduate Capstone Thesis, Ashoka University, 2024 [[manuscript](#), [presentation](#)]

Rajesh, N., Ramaswamy, V., Gupta, D. *Investigating Brain-like CNNs and Consequences*

Invited Presentation, ICCSSS Tübingen, 2023 [[presentation](#)]

Rajesh, N., Gupta, D. *Developmental PreTraining (DPT) for Image Classification Networks.*

Research Project, Ashoka University, 2023 [[technical report](#)]

Satish, R., **Rajesh, N.,** et. al. *NeuroCrypt: A multimodal coercion-resistant implicit memory authentication system*

Conference Abstract, AAAI-2022, Vancouver [[abstract](#)]; Conference Paper: Under Review [[paper](#)]

COMMUNITY SERVICE AND EXTRACURRICULAR ACTIVITIES

IEEE Ashoka Student Branch | Co-founder and Chairperson

- Led a team of 36 members to organise technical and research workshops, community-building events, talks and seminars to advance and foster the STEM culture at Ashoka University
- Ideated and organised Ashoka University's first ever inter-university STEM Festival: *Chimera*, with 400+ participants, 5 keynote talks, 6 scientific competitions, poster presentations, and panel discussions in collaboration with the university's Biology, Computer Science and Physics Societies
- Raised 600,000 INR through corporate and academic sponsorships and managed the budget allocation

NEEV: The Community Engagement Club | Core Team member and Curriculum Designer

- Designed weekly science lesson plans for less-privileged primary-school students in rural Haryana
- Investigated school environments and curricula in local villages to identify critical educational gaps, enabling the development of targeted, impactful lesson plans to address challenges effectively

Neuromatch Academy 2021 | Computational Neuroscience Certification

- Collaborated in a group project where we analysed Electrocorticography (ECoG) data to predict noise levels in visual stimuli shown to subjects using power-spectrum based regression analysis

HONOURS AND AWARDS

- Silver Medal, CS Department, Ashoka University **2024**
- Teaching Assistantship Excellence Award **2022, 2024**
- Travel Grant, International Interdisciplinary Computational Cognitive Science Summer School **2023**
- Dean's List for Academic Recognition (3.65+ semester GPA) **all semesters, 2020-24**
- A-Levels High School Distinction **2020**
- HSK Mandarin Level 3 Proficiency **2018**

TECHNICAL SKILLS AND INTERESTS

Programming Languages: Python, MATLAB, JavaScript C/C++ , Haskell

Human Languages: English, Hindi, Malayalam, Tamil, French, Mandarin

Tools and Libraries: High Performance Computing, TensorFlow, PyTorch, scikit-learn, SciPy, Keras, OpenCV, pandas, NumPy, Matplotlib, ~~ETX~~, NodeJS, Hyperledger Fabric

Interests: Deep Learning, Computer Vision, Biological Vision, Computational Neuroscience, Software Development

REFERENCES

Professor SP Arun | Professor & Chair, Centre for Neuroscience, IISc Bangalore

Professor Debayan Gupta | Assistant Professor of Computer Science, Ashoka University

Professor Venkat Ramaswamy | Assistant Professor of Computer Science, BITS Pilani University

Professor Subhashis Banerjee | Head of Department & Professor, Computer Science, Ashoka University

Professor Bittu K | Associate Professor of Biology and Psychology, Ashoka University