NIRANJAN RAJESH

(+91) 6379 286 963 | niranjanrajesh02@gmail.com | Personal Website | Research Blog

EDUCATION

Ashoka University   Haryana, India
Postgraduate Diploma in Advanced Studies (DipASR) - Advanced Major   *Aug 2023 – Present*
  - Capstone Project and Thesis in Machine Learning

Bachelor of Science (Hons.) - Computer Science   *Aug 2020 – May 2023*
  - Graduated Magna Cum Laude with a 3.86 GPA

WORK EXPERIENCE

Undergraduate Teaching Assistant   Jan 2022 – Present
Ashoka University   *Haryana, India*
  - Assisted in **3** core Computer Science courses:
    * Introduction Computer Programming
    * Data Structures
    * Introduction to Machine Learning
  - Conducted weekly office hours and discussion sections to teach and guide students
  - Managed course logistics including grading and setting exam papers
  - Student Feedback: 4.7/5.0 (220+ students)

Research Intern   April 2022 – May 2023
Mphasis Lab for Computational Thinking and Trivedi School of Biosciences   *Haryana, India*
  - Employed Deep Learning techniques to analyse micro-environments in biopsy slides
  - Conducted comprehensive literature review and model bench-marking
  - Designed novel vision techniques to and address class imbalance in histopathology data

Full Stack Web Developer   Sep 2020 – Jan 2022
Beyond Design Studio   *Tamil Nadu, India*
  - Served as one of the primary software developers for a design startup from day zero
  - Engineered full stack mobile and web applications for companies and organisations
  - Collaborated closely with peers from other departments to meet design requirements of clients

RESEARCH EXPERIENCE

CNN Manifold Identification | Capstone Project   In Progress
  - Analysing the underlying manifolds within CNNs trained in Object Recognition
  - Exploring manifold representation and disentanglement over hierarchical CNN layers
  - Verifying CNN behaviour like adversarial robustness through the lens of manifolds

Developmental Computer Vision | ML + Developmental Cognition   [arXiv link]
  - Conducted literature review in the field of Early Visual Development in infants
  - Explored applications of insights from Developmental Psychology to Computer Vision
  - Developed a phased pre-training approach for CNNs based on visual learning in infants

NeuroCrypt | A coercion-resistant authentication system   In Review
  - Developed an authentication system leveraging concepts from Cognitive Science
  - Carried out literature review in Cryptography and conducted behavioural experiments
  - Published work in the AAAI-22 Student Abstract and Poster Program - link

Deep Learning in Histopathology | Automated Analysis of Triple Negative Breast Cancer   [arXiv link]
  - Developed a suite of fine-tuned supervised CNNs for patch-level classification Biopsy Slide
  - Explored unsupervised learning after several feature-extraction techniques
  - Designed active learning algorithms to tackle annotation burden and class imbalance

Chem X ML | Analysis of Chemical Spectrograms   [arXiv link]
  - Utilised ML algorithms to infer chemical features of a compound from its UV-vis spectra
  - Exploring applications of insights from Developmental Psychology to Computer Vision
  - Developing a phased pre-training approach for CNNs based on visual learning in infants

OTHER ACTIVITIES

IEEE Ashoka Student Branch | Chairperson (2023) and Founding Secretary (2022)
- Co-founded the official Student Branch of IEEE at Ashoka Univerity
- Led a team of 30+ branch members and managed all branch affairs
- Organised and conducted technical workshops, fundraising events and research-oriented events

Neuromatch Academy | Computational Neuroscience Certification
- Learned emerging computational neuroscience tools and techniques
- Employed various machine learning models in the context of understanding brain activity
- Collaborated in a group project where Electrocorticography (ECoG) data was used to model visual perception

IICCSSS Tübingen | Computational Cognitive Science Summer School
- Presented a talk on brain-like CNNs and their consequences
- Won the 'Cognitive Modelling of Human and LLM Data' track in the Hackathon
- Engaged in workshops that covered Cognitive Modelling, Applied Machine Learning and Neuroscience

HONOURS AND AWARDS

- Dean's List for Academic Recognition (every semester) **2020-23**
- Teaching Assistant Excellence Award **2022**
- A-Levels High School Distinction **2020**
- HSK Mandarin Level 3 Proficiency **2018**
- Duke of Edinburgh International Award (Silver and Bronze) **2018**

TECHNICAL SKILLS AND INTERESTS

Programming Languages: Python, C/C++, R, MATLAB, Java, JavaScript, Typescript, Haskell, SQL, HTML/CSS, Assembly

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

Tools and Libraries: High Performance Computing, TensorFlow, PyTorch, scikit-learn, SciPy, Keras, OpenCV, pandas, NumPy, Matplotlib

Interests: Deep Learning, Neuroscience, Computer Vision, Computational Cognitive Science, Software Development, Community (TV- 2009)

REFERENCES

Professor Debayan Gupta | Assistant Professor of CS, Ashoka University | debayan.gupta@ashoka.edu.in

Professor Subhashis Banerjee | Head of CS Department, Ashoka University | suban@ashoka.edu.in

Professor Venkat Ramaswamy | Assistant Professor of CS, BITS Pilani University | venkat@hyderabad.bits-pilani.ac.in

Professor Bittu K | Head of Psychology Department, Ashoka University | bittu@ashoka.edu.in