

EDUCATION

- **Indian Institute of Technology, Roorkee** Roorkee, India
Bachelor of Technology in Electronics and Communication Engineering; GPA: 8.554/10.000 July 2016 - July 2020

RESEARCH EXPERIENCE

- **Research Assistant** Hyderabad, India
Supervised by Dr CV Jawahar and Dr Vinay Namboodiri July 2020 - Present
 - Studying the problem of low resource neural machine translation through the lens of transfer learning particularly in the context of Indian languages.
- **Undergraduate thesis** Shanghai, China
Supervised by Dr Lu Hongtao and Dr Debasis Ghosh August 2019 - May 2020
 - Undergraduate [thesis](#); partly carried out at Shanghai Jiaotong University.
 - Studied the problem of continual learning in neural networks and the problem of catastrophic interference with special focus on a setting where the information signal from the task boundaries is not made available to the model beforehand
 - Attempted to provide an empirical basis for reported findings that a class of approaches (regularization based methods) in isolation were insufficient to mitigate catastrophic forgetting in neural networks.
- **Research Project** Roorkee, India
Dr Partha Pratim Roy September 2018 - December 2018
 - Worked on the problem of text detection from images especially text inclined at an angle
 - Experimented with an approach which could learn a more general quadrilateral shape instead of a regular rectangular bounding box by introducing parameters to offset the co-ordinates of a rectangular bounding box
 - Designed experiments to test this idea against the present state of the art approaches in text detection
- **Research Project** Roorkee, India
Dr Biplab Banerjee December 2017 - February 2018
 - Designed and conducted experiments on various architectures that were based on the idea of Siamese neural networks
 - Conducted an extensive literature survey over the problem of stereo vision

INTERNSHIPS

- **BCMI Lab, SJTU** Shanghai, China
Supervised by Dr Lu Hongtao May 2018 - July 2018
 - Studied the literature on the then state of the art object detection networks
 - Performed a comparative study on two-stage and one-stage object detectors to determine the advantages and disadvantages of each approach
 - Put together an implementation of Mask R-CNN to gain a better understanding of some of the ideas introduced in that particular paper

American Express

Bengaluru, India

Machine Learning Engineer

May 2019 - July 2019

- Involved in the development of architectures based on CNN's as an alternative to the RNN based architectures; effort to achieve better performances in terms of time and speed
- Implemented a CNN model using the principles established in Neural Ordinary Differential Equations; established the initial benchmarks for this model to motivate further internal research
- Proposed a change in the data preparation strategy which led to a significant increase over the previously established in-house benchmarks

PROJECTS

WAT 2020

[\[link\]](#)

- Proposed an approach which utilized encoder pre-training and fine-tuning routines to train a multilingual model.
- On the leaderboard, the approach was ranked second on the En-Te task and fourth on the En-Od task

ExpertNet-PyTorch

[\[link\]](#)

- Implemented and open-sourced the ideas presented in the CVPR 2017 paper "Expert-gate: Lifelong learning with a network of experts"
- Designed and conducted experiments to enable testing these ideas on a lower scale (in terms of the size of the datasets used and computational resources required)

MaS-PyTorch

[\[link\]](#)

- Implemented and open-sourced the ideas presented in the ECCV 2018 paper "Memory Aware Synapses: Learning what (not) to forget"
- Minimized the redundancies present in the author's implementation

Habitat-API

[\[link\]](#)

- Habitat-API is a modular high-level library maintained by Facebook Research for end-to-end development in embodied AI
- Implemented a Behavioral cloning baseline to enable bench-marking of future embodied AI algorithms

Mask RCNN

[\[link\]](#)

- Worked on developing an open sourced version of Mask R-CNN built using PyTorch
- Was a part of GitHub Trending when released to the public

PredictX: Open Health Hackathon

[\[link\]](#)

- A recommender system that the team built which predicted colleges (among a limited number of options) and grades using the datasets of the students from Kaggle
- Trained model gave a commendable accuracy of 77.6 % on the predictions made. Model was also substantially resistant to outliers

Course Project: Computer Architecture

[\[link\]](#)

- Developed an implementation of a 24 bit RISC processor in Verilog
- Used a self developed Instruction Set Architecture
- Optimized performance by implementing necessary pipelining protocols

- **Course Project: Digital Image Processing**
 - [\[link\]](#) [\[report\]](#) [\[slides\]](#)
 - Implemented and open sourced the ideas presented in the paper "When sparsity meets low-rankness: Transform learning with non-local low-rank constraint for image restoration" in Python
 - Developed an experimental procedure to prove the solution of the optimization equation proposed and used by the authors
- **Optical Character Recognition for the submission of forms**
 - [\[link\]](#)
 - Part of a team responsible for the development of a module that could recognize the package number (delivery services) using convolutional neural networks
- **Steps: Smart India Hackathon**
 - [\[link\]](#)
 - Developed a chatbot for a proposed platform for startups and investors to enable direct communication regarding funding between the interested parties

RELEVANT COURSES (INCLUDING ONLINE)

- **CS231N:** CNNs for Visual Recognition; Stanford course by Dr Andrej Karpathy
- **Reinforcement Learning:** UCL course by Dr Dave Silver
- **deeplearning.ai:** Coursera courses by Dr Andrew Ng
- **Digital Image Processing:** Part of coursework at IIT Roorkee
- **Linear Algebra:** Part of coursework at IIT Roorkee

ACHIEVEMENTS

- **ComedK 2016:** Ranked 3 among a pool of more than ten thousand applicants for the examination
- **JEE Advanced 2016:** Ranked 1247 among a pool of hundred thousand applicants for the examination
- **Smart India Hackathon:** The team made it to the final round alongside 250 other teams selected nation-wide

PROGRAMMING SKILLS

- **Languages:** Python, C++, Verilog
- **Technologies:** PyTorch, Keras, Tensorflow, Git, Linux