
EDUCATION

- **Indian Institute of Technology, Roorkee** Roorkee, India
B.Tech in ECE; CGPA: 8.554/10.000 (First Division with Distinction) 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 catastrophic forgetting in multilingual neural machine translation systems.
- **Undergraduate thesis** Shanghai, China / Roorkee, India
Supervised by Dr Hongtao Lu and Dr Debashis Ghosh July 2019 - May 2020
 - Undergraduate [thesis](#); partly carried out at Shanghai Jiao Tong University (SJTU).
 - Worked on the problem of Continual Learning in neural networks with a special focus on the task-agnostic setting.
 - Provided 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
Supervised by Dr Partha Pratim Roy September 2018 - December 2018
 - Worked on the problem of text detection from images especially irregular text inclined at an angle.
 - Designed an approach to 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 then state of the art approaches in text detection.
- **Research Project** Roorkee, India
Supervised by 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 on the problem of Computer Stereo Vision.

INTERNSHIPS

- **American Express** Bengaluru, India
Machine Learning Engineer May 2019 - July 2019
 - Improved the inference time of the fraud detection system by proposing a CNN based alternative to the in-house RNN based model.
 - Proposed changes to the data preprocessing routines which led to a significant improvement in the system's results over the previously established in-house benchmarks.
 - Implemented a CNN using the principles established in Neural Ordinary Differential Equations; established the initial benchmarks for this model to motivate further internal research.
- **BCMI Lab, SJTU** Shanghai, China
Supervised by Dr Lu Hongtao May 2018 - July 2018
 - Performed a comprehensive comparative study on two-stage and one-stage object detectors.
 - Put together an implementation of Mask R-CNN in an effort to recreate the results reported in the paper.

PUBLICATIONS

- Exploring Pair-Wise NMT for Indian Languages
Sai Himall Allu, ASVS Kartheek, S Sridhar, Zeeshan Khan, Aman Singhal, Vinay Namboodiri, CV Jawahar
ICON 2020: Short Paper

- **WAT 2020**

- [\[link\]](#)

- Proposed an approach which utilized encoder pre-training and fine-tuning routines to train a multilingual neural machine translation model.
 - On the leaderboard, the approach was ranked second on the English-Telugu task and fourth on the English-Odia task.

- **Habitat-Lab Fork**

- [\[link\]](#)

- Habitat-Lab is a modular high-level library maintained by Facebook Research for end-to-end development in Embodied AI.
 - Worked on implementing a Behavioral Cloning baseline in an effort to support bench-marking of future Embodied AI algorithms.

- **Mask R-CNN**

- [\[link\]](#)

- Implemented and open sourced a version of Mask R-CNN built using PyTorch.
 - Was a part of GitHub Trending when released to the public.
 - As of February 8, 2021 the project has 924 stars and 170 forks.

- **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.

- **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 to the optimization problem framed by the authors.

- **Optical Character Recognition for the submission of forms**

- [\[link\]](#)

- Part of a team responsible for the development of a CNN based application to optimize campus delivery services.

- **Steps: Smart India Hackathon**

- [\[link\]](#)

- Developed the chatbot for a proposed platform enabling direct interaction between startup founders and investors.

RELEVANT COURSES (INCLUDING ONLINE)

- **Computer Networks:** Part of coursework at IIT Roorkee
- **Computer Architecture:** Part of coursework at IIT Roorkee
- **Object Oriented Programming:** Part of coursework at IIT Roorkee
- **Data Structures:** Part of coursework at IIT Roorkee
- **Digital Image Processing:** Part of coursework at IIT Roorkee
- **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

ACHIEVEMENTS

- **Undergraduate thesis:** One of the two students selected from the ECE department to conduct our thesis abroad.
- **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/C++, Verilog
- **Technologies:** PyTorch, JAX, Keras, Tensorflow, Git, Linux

VOLUNTEER WORK AND EXTRA-CURRICULARS

- **National Service Scheme (NSS), IIT Roorkee:** Organized and participated in bi-annual blood donation camps hosted by NSS, IIT Roorkee.
- **Cinematic Section, IIT Roorkee:** Wrote and supervised scripts for several productions of the Cinematic Section at IIT Roorkee.
- **WatchOut, IIT Roorkee:** Worked as a junior editor for the official campus magazine of IIT Roorkee.

REFERENCES

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Dr Hongtao Lu
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Dr Vinay Namboodiri
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