

Divyam Goel

JUNIOR YEAR - ELECTRONICS AND COMMUNICATIONS

Indian Institute of Technology Roorkee, India

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Education

Indian Institute of Technology Roorkee

Roorkee, India

B.TECH. IN ELECTRONICS AND COMMUNICATIONS ENGINEERING

2018 - Present

- Cumulative Grade Point Average - **9.16/10.0**
- Relevant Courses: Probability and Statistics (MAN-006), Linear Algebra (MAN-001), Calculus (MAN-002), Data Structures (CSN-103), Signals and Systems (ECN-203), Artificial Intelligence (CSN-371), Digital Signal Processing (ECN-312), and Digital Image Processing (ECN-316)

Delhi Public School Gurgaon

Gurgaon, India

SENIOR SECONDARY EDUCATION

2015 - 2017

- Secured **93.75%** in the All India Secondary School Examination

Delhi Public School Gurgaon

Gurgaon, India

SECONDARY EDUCATION

2014 - 2015

- Cumulative Grade Point Average - **9.8/10.0**

Experience

MITACS Globalink Research Intern | UBC

Kelowna, Canada

DR. FATEMEH H. FARD | UBC

June 2021 - Present

- Working on improving knowledge transfer from large pre-trained language models to other language modalities such as code.

Summer Research Intern | GIST Vision Lab

Gwangju, South Korea

DR. JONGHYUN CHOI | GIST

May 2021 - Present

- Working on improving the generalization performance of AI models in a continual learning setup.

Research Intern | Pando Labs

Chennai, India

PANDO CORP PLC

Aug 2020 - Nov 2020

- Worked on developing a practical Deep Reinforcement Learning Solution to optimize shipping costs in the Supply Chain industry.
- My project made big strides in solving the 3D bin packing and capacitive vehicle routing problems using off-policy agents.
- Re-architected a heuristic algorithm to improve efficiency and allow parallelised operations on GPUs.

Projects

Semi-NMF Regularized Autoencoders for Hyperspectral Unmixing

IIT Roorkee

DR. SAURABH KHANNA | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Feb. 2020 - Present

- Developed a new regularization scheme for autoencoders based on Semi-NMF optimization constraints.
- Applied the approach to hyperspectral unmixing, showing improvements in performance over synthetic and real world datasets.
- Implemented and reproduced the results of the paper 'Hyperspectral Unmixing Using a Neural Network Autoencoder'. [\[Github Link\]](#)

A Multi-Task Approach for the POS Tagging of Code-Mixed Social Media Data

IIT Roorkee

DR. RAKSHA SHARMA | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Sept. 2020 - Feb. 2020

- Developed a novel Multi-Task learning approach for code-mixed POS tagging (Hindi & English).
- Proposed methodology augments the capacity of learned word embeddings and can hence be extended to other low-resource domains.
- A paper for this work has been submitted to CoNLL'21.

Leveraging Dependency Grammar for Offensive Language Detection

IIT Roorkee

DR. RAKSHA SHARMA | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

June 2020 - Sept. 2020

- Developed a novel encoder architecture to utilise syntactic dependency structures for detecting hate speech in Twitter data.
- The encoder integrates the dependency parse tree of a post into the model's deep-feature space using Graph Convolutional Networks.
- A paper for this work has been submitted to EMNLP'21.

Direction Finding Proximity Fuze Sensor

IIT Roorkee

TERM PAPER | ENGINEERING ELECTROMAGNETICS

Feb. 2020 - April 2020

- Surveyed Machine Learning methods employing the use of LIDAR for a proximity fuze sensor.
- Proposed a Gaussian Mixture Model for mesh clutter reduction over the LIDAR generated state space.

Medical Image Segmentation and Classification Problems

IIT Roorkee

DR.BALASUBRAMANIAN RAMAN | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Dec 2019 - March 2020

- Developed a deep learning architecture using dilated convolutions, trained using an active contour loss for segmentation.
- Developed a conditional-GAN as a preprocessing step for data augmentation and noise reduction specific to ultrasound images.
- Reviewed latest research in GANs, HCI and other Deep Learning techniques for improved segmentation in medical imaging.

Exploratory Study of Latest Prefetching Technologies

IIT Roorkee

COURSE PROJECT | COMPUTER ARCHITECTURE

Sept. 2019 - Nov. 2019

- Surveyed modern prefetching mechanisms, identifying present day bottlenecks and pinpointing regions of research interest.
- Investigated the performance and underlying theoretical/practical constructs of RCTP: Region Correlated Temporal Prefetchers.

Self Driving Car

IIT Roorkee

TEAM MEMBER | ARTIFICIAL INTELLIGENCE AND ELECTRONICS SOCIETY

Jan 2019 - April 2019

- Project was presented at the annual technical exhibition - **Srishti**.
- Developed a pipeline for lane detection using a combination of heuristic and deep learning methods.
- Integrated the python codes with Raspbian modules for sensorimotor control of the RC vehicle. [\[Github Link\]](#) [\[Demo\]](#)

Open Source Projects

- **DeepSemiNMF**: Implemented and reproduced the results obtained in the paper 'A Deep Semi-NMF Model for Learning Hidden Representations (Trigeorgis2014)' using PyTorch [\[Github-link\]](#)
- **Sentiment Analysis**: Fine Tuned a BERT model on the SMILE Twitter Emotion Dataset [\[Github-link\]](#)
- **Neural Network Visualizer**: Developed a Web Application using Flask and Streamlit for improved visualization of simple FFNNs trained using the Keras Functional API [\[Github-link\]](#)

Notable Achievements

Selected for the prestigious MITACS Globalink Research Internship program

Dec. 2020

IIT Roorkee Heritage Foundation Excellence Award

March 2020

The Special Award For Academic Excellence

May 2017

Skills

Software Python, C++, Matlab, Octave, Keras, Tensorflow, PyTorch, Git, LaTeX (extensive)
JavaScript, Qiskit, PERL, PyTorch-Lightning, Java (basic)

Languages English, Hindi (native)

Extracurricular Activities

Vision and Language Group

IIT Roorkee

CORE MEMBER

Dec 2020 - Present

- Core member of the Vision and Language Group of IIT Roorkee, a reading group that promotes interest in research in **Deep Learning**.
- Involved in the organisation of paper reading sessions and contributing to the ongoing research projects.

IEEE Student Chapter

IIT Roorkee

CORE MEMBER

Feb. 2020 - Present

- Core member of the IEEE student chapter of IIT Roorkee, a student group that promotes interest in research in **Electronics and Computing**.

Watch Out! Official Student Media Body

IIT Roorkee

CHIEF NEWS COORDINATOR

Aug. 2018 - Present

- Board Member of the official Student Media Body of IIT Roorkee.
- Leading a team of over 75 editors, designers and web-developers for the magazine which covers a plethora of topics including intra-campus journalism, science, technology and philosophy.

National Sports Organisation | Squash Team

IIT Roorkee

TEAM MEMBER

Aug. 2018 - Present

- Participated in both inter and intra college sporting events.

References

Dr. Raksha Sharma

ASSISTANT PROFESSOR

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Dr. Balasubramanian Raman

PROFESSOR

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