Divyam Goel

SENIOR YEAR - ELECTRONICS AND COMMUNICATIONS
Indian Institute of Technology Roorkee, India

📞 (+91)8826034373 | ✉ divyamgoel3@gmail.com | 🏠 dv-fenix.github.io | ⌂ dv-fenix | in divyamgoel3

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**

Delhi Public School Gurgaon
Gurgaon, India

SENIOR SECONDARY EDUCATION   *2014 - 2017*
- All India Senior School Certificate Examination - **93.75%**
- All India Secondary School Examination - **9.8/10.0**

Work Experience

Research Assistant | GIST Vision Lab
Gwangju, South Korea

PROF. JONGHYUN CHOI | GIST   *July 2021 - Present*
- Working on improving the current state of prompt-based learning for story visualization in a zero-shot setup.
- Collaborated on a research project which aims to build multi-modal transformers for story visualization.

MITACS Globalink Research Intern
Kelowna, Canada

PROF. FATEMEH H. FARD | UNIVERSITY OF BRITISH COLUMBIA   *June 2021 - Sept. 2021*
- Led a collaborative effort to develop efficient but accurate language models for software engineering tasks.
- Exploited cross-modal transfer of adapters to achieve 140×better parameter budget and ∼95% efficient storage over SOTA.
- Built the Super Code Clone Detection - 88 (SCD-88) dataset for evaluation on python-specific code clone detection.

Research Intern | Pando Labs
Chennai, India

PANDO CORP PLC   *Aug 2020 - Nov 2020*
- Worked on developing novel deep reinforcement learning solutions to optimize shipping costs in the freight industry.
- My project made big strides in solving the 3D bin packing and capacitative vehicle routing problems using off-policy agents.
- Re-architected a heuristic algorithm to improve efficiency and allow parallelised operations on GPUs.

Selected Projects

Semi-NMF Regularized Autoencoders for Hyperspectral Unmixing
IIT Roorkee

PROF. SAURABH KHANNA | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE   *Feb. 2021 - July 2021*
- Derived a new regularization scheme for autoencoders based on Semi-NMF optimization constraints.
- Applied to hyperspectral unmixing, showing improvements in performance over synthetic and real world datasets.

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

PROF. RAKSHA SHARMA | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE   *Sept. 2020 - Feb. 2021*
- Led a collaborative effort to develop a novel Multi-Task learning approach for code-mixed POS tagging (Hindi & English).
- Proposed methodology augments the capacity of word embeddings and can be extended to other low-resource domains.

Leveraging Dependency Grammar for Offensive Language Detection
IIT Roorkee

PROF. RAKSHA SHARMA | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE   *June 2020 - Sept. 2020*
- Developed a novel approach for hate speech detection on Twitter which achieves state-of-the-art performance.
- The proposed approach utilizes inherent dependency structures to overcome biases introduced by pejorative word senses.

Customer Churn Management
IIT Roorkee

PROF. JONGENDRA KUMAR NAYAK | INDIAN INSTITUTE OF TECHNOLOGY ROORKEE   *Aug. 2020 - Dec. 2020*
- Led a collaborative effort to develop an agent that predicts consumer churn in the Indian Telecom Industry.
- Conducted an empirical analysis of the interpretability of data mining techniques as customer churn prediction models.
- Hosted the demo agent on the heroku-app. **[Report] [Demo]**

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

Prof. Balasubramanian Raman | Indian Institute of Technology Roorkee   *Dec 2019 - March 2020*

- Designed an agent using dilated convolutions, trained using an active contour loss for segmentation.
- Developed a conditional-GAN 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.

Self Driving Car
IIT Roorkee

Team Member | Artifical 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]**

Notable Achievements

2021	**MITACS GRI Scholar**: Research grant awarded by the **Mitacs-SICI partnership** to top international undergraduates for a research internship under the supervision of Canadian university faculty members.
2020	**IIT Roorkee Heritage Foundation Excellence Award**: Awarded for excellence in academia & leadership.
2017	**The Special Award For Academic Excellence**: Awarded to the top 3 students of DPS Gurgaon for academic excellence.

Relevant Courses

Machine Learning	Artificial Intelligence, Deep Learning for Computer Vision, Natural Language Processing
Mathematics	Probability and Statistics, Linear Algebra, Calculus, Discrete Mathematics
Fundamentals	Data Structures, Computer Architecture, Computer Programming, Digital Logic Design
Electronics	Digital Signal Processing, Digital Image Processing, Signals and Systems, Automatic Control Systems, Communication Systems and Techniques, Digital Communication
MOOCs	Reinforcement Learning (David Silver), Deep Learning Specialization (DeepLearning.AI), Convex Optimization (Stephen Boyd)

Datasets

Super Code Clone Detection - 88 (SCD-88)
Kelowna, Canada

Prof. Fatemeh H. Fard | University of British Columbia   *Sept. 2021*

- The dataset contains 11,400 python code examples for a retrieval based code clone detection task.
- The dataset is a python-specific subset of the cross-language code clone detection dataset scraped from AtCoder.

Programming Skills

Languages	Python, Java, C++, Matlab, Octave, PERL
Tools and Libraries	PyTorch, Keras, Tensorflow, Scikit, Jupyter, Numpy, OpenCV, Flask, Streamlit
Others	Git, Vim, LaTex, Bash, HTML/CSS, Docker

Extracurricular Activities

Vision and Language Group | Core Member
Dec 2020 - Present

- Organised deep learning centric paper reading sessions and contributing to ongoing research projects.

IEEE Student Chapter | Core Member
Feb. 2020 - Present

- Organised several paper reading sessions and invited talks to promote student interest in electronics and computing.

Watch Out! | Chief News Coordinator
Aug. 2018 - Present

- Leading a team of over 75 editors, designers and web-developers at the official student media body of IIT Roorkee.

National Sports Organisation | Squash Team
Aug. 2018 - April 2020

- Participated in both inter and intra college sporting events.

References

- **Fatemeh H. Fard**, Assistant Professor, University of British Columbia (fatemeh.fard@ubc.ca)
- **Saurabh Khanna**, Assistant Professor, IIT Roorkee (sakhanna@ece.iitr.ac.in)
- **Raksha Sharma**, Assistant Professor, IIT Roorkee (raksha.sharma@cs.iitr.ac.in)