Aarush Gupta

Third Year Undergraduate · Computer Science and Engineering
Indian Institute of Technology Roorkee, India
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Interests

Deep Learning

- Computer Vision, Natural Language Processing and related applications.

Education

Indian Institute of Technology Roorkee — *Roorkee, India*

B.Tech. in Computer Science & Engineering — *2016 - Present*

- Cumulative Grade Point Average: 8.589/10

DAV Senior Secondary School (Lahore) — *Chandigarh, India*

Senior Secondary Education — *2014 - 2016*

- Secured 90.4% in 12^{th} standard (Examination conducted by Central Board of Secondary Education, India).

Navy Children School — *Port Blair, India*

Secondary Education — *2012 - 2014*

- Secured 10.0/10.0 CGPA in 10^{th} standard (Examination conducted by Central Board of Secondary Education, India).

Publications

An Attention Model for Group-Level Emotion Recognition

Aarush Gupta*, Dakshit Agrawal*, Hardik Chauhan, Jose Dolz, Marco Pedersoli

Accepted for ACM International Conference on Multimodal Interaction(ICMI) 2018 **[Link]**.

Experience

Indian Institute of Science Bangalore, India

Research Internship | Dr. Venkatesh Babu — *December 2018 - January 2019*

- Developed a neural network that generates a high dynamic range image from a group of images captured with different exposure settings.
- Designed a neural network loss function to extract the brightness invariant features of images for use in HDR image fusion.

École de Technologie Supérieure, Montreal

Research Internship | Dr. Marco Pedersoli — *May 2018 - July 2018*

- Developed a two-branched neural network for jointly learning the scene and facial features of an image for group-level emotion recognition **[GitHub Link]**.
- Employed the DenseNet161 model to take into account the features of each image as a whole while predicting the emotions.
- Developed various attention mechanisms for effectively merging the facial features of people in the images.
- Trained and evaluated the neural network on the Group Affect Dataset 2.0 and the EmotiC Dataset.

Projects

Triplet VAE for Zero-Shot Learning — *IIT Roorkee*

Advised by Prof. Biplab Banerjee — *January 2018 – April 2018*

- Developed a classifier based on Zero-Shot Learning for the Animals with Attributes dataset.
- Used Deep Metric Learning to learn a joint latent embedding of the visual and semantic features of the data points using a VAE based on the Triplet Loss function.

Unsupervised Human Action Detection in Videos

IIT Roorkee

Advised by Prof. Biplab Banerjee *August 2017 – January 2018*

- Developed a model which divides a video into clusters of video frames based on the human actions depicted by the frames.
- Implemented Spectral Clustering, using the Normalized Cuts Algorithm, for unsupervised clustering of video frames which constitute a common human action.
- Used Gaussian Mixture Models and Conditional Random Fields for incorporating the temporal features of the frames into the clustering algorithm.

Sentiment Analysis

IIT Roorkee

Advised by Prof. Balasubramaniam Raman *August 2017 - October 2017*

- Applied various DNN architectures on the Twitter Dataset to predict the sentiments of the tweets.
- Also developed a Keras-based Ensemble model for generalized text-based multiclass classification.

SMS Classifier

SDSLabs Hackathon, IIT Roorkee *September 2017*

- Developed an app, which classifies SMS messages into spam and non-spam categories, during SDSLabs Hackathon conducted by SDSLabs **[GitHub Link]**.

Other Significant Projects

Some other significant projects are as follows:

- **Course Project-Survey Report on Open-Source Computing Hardware:** Undertaken during the course CSN-221 Computer Architecture and Microprocessors. Prepared a survey report on open-source computing hardware with focus on hardware like Arduino, Raspberry Pi and BeagleBoard, their use cases, ground-level applications and future scope **[Report Link]**.
- **Course Project-Multilevel Feedback Queue Scheduling Algorithm:** Undertaken during the course CSN-232 Operating Systems. Implemented the MLFQ job scheduling algorithm using Python **[Report Link]**.
- **Course Project-SIC-XE Assembler:** Undertaken during the course CSN-252 System Software. Implemented an assembler for the SIC-XE architecture.

Achievements

International

2018 **4th Rank**, EmotiW 2018 Group-Level Emotion Recognition Challenge *Colorado, USA*

National

2016 **All India Rank 363**, Joint Entrance Examination(Advanced); 200,000 candidates *India*

2016 **Air India Rank 3436**, Joint Entrance Examination(Mains); 1,000,000 candidates *India*

2015 **Fellowship Holder**, **Kishore Vaigyanik Protsahan Yojana**, one of the most prestigious national fellowships awarded by **Indian Institute of Science** and **Government of India** to students who show talent and aptitude in research **[Link]** *India*

Extracurricular Activities

Vision & Language Group (VLG)

Roorkee, India

Core Member *July 2018- Present*

- Core member of VLG, a student group that promotes **Deep Learning research culture** in the campus by discussing relevant research papers and working on related projects. **[Website Link]**.
- Involved in overall planning of the group, including organizing and moderating paper discussions, contributing to projects, etc.

Student Mentorship Program IIT Roorkee

Student Mentor

- Involved in guiding the freshmen of IIT Roorkee through various spheres of campus life.

Programming Skills

Languages	Python, C++, C
Operating Systems	Windows, Linux
Tools	Keras, PyTorch, Jupyter Notebook, Spyder, Git
Familiar with	Tensorflow, Java, JavaScript

References

Prof. Marco Pedersoli *Montreal, Canada*

Assistant Professor, École de Technologie Supérieure (ETS), Montreal

Email: Marco.Pedersoli@etsmtl.ca

Prof. Biplab Banerjee *Mumbai, India*

Assistant Professor, Centre of Studies in Resource Engineering, IIT Bombay

Email: bbanerjee@iitb.ac.in

Prof. Ranita Biswas *Roorkee, India*

Assistant Professor, Dept. of Computer Science and Engineering, IIT Roorkee

Email: ranitafcs@iitr.ac.in