Aniket **Agarwal**

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Education

Indian Institute of Technology Roorkee — *Roorkee, India*

Integrated MSc Applied Mathematics — *July 2017-June 2022*

- Cumulative Grade Point, CGPA:7.82/10

Maharaja Agrasen Model School — *New Delhi, India*

High School | PCM(along with Computer Science) — *March 2015-March 2017*

- Percentage:94.8%

Publications

Exploring Long Tail Visual Relationship Recognition with Large Vocabulary — *ICCV 2021*

Aniket Agarwal*, Sherif Abdelkarim*, Panos Achlioptas, Jun Chen, Jiaji Huang, Boyang Li, Kenneth Church, Mohamed Elhoseiny — *Paper Link*

RelTransformer: A Transformer-Based Long-Tail Visual Relationship Recognition — *CVPR 2022*

Jun Chen, **Aniket Agarwal**, Sherif Abdelkarim, Deyao Zhu, Mohamed Elhoseiny — *Paper Link*

Visual Relationship Detection using Scene Graphs: A Survey — *Survey paper*

Aniket Agarwal*, Ayush Mangal*, Vipul* — *Paper Link*

Revisiting CycleGAN for semi-supervised segmentation — *Arxiv Preprint*

Arnab Mondal, **Aniket Agarwal**, Jose Dolz, Christian Desrosiers — *Paper Link*

Research Experience

Princeton NLP group — *New Jersey, USA*

Research Internship | Prof Karthik Narasimhan — *Oct 2021 - Sep 2022*

- Worked on the problem of Long Horizon Video Understanding.
- Proposed an automated annotation pipeline, dubbed ASAP, for generating LVU bechmarks from sports videos. The pipeline is composed various basic operations like OCR calls, template matching, etc making it easy to adapt for most sports.
- Created a new benchmark using ASAP using cricket videos, dubbed LCric, with an average clip length of 55 mins. Also proposed an automated query generation algorithm specifically designed for sports-based benchmarks.
- We plan to submit a paper for the same at ICCV 2023.

NUS CVML group — *Singapore*

Research Internship | Prof Angela Yao — *Jun 2021 - Nov 2021*

- Worked on the task of egocentric hand action recognition, where we propose an egocentric hand actions dataset with three states, 'pre-action', 'action' & 'post-action', labelled.
- The labeling of three states enabled us to propose new tasks such as state modifcation recognition along with vanilla action recognition.
- Developed the annotation pipeline, and benchmarked the dataset on various baselines like MSG3D, ST-GCN, H+O unified pose estimation, etc.

Vision-CAIR group, KAUST — *Saudi Arabia*

Research Internship | Prof Mohamed Elhoseiny — *May 2020 - Mar 2021*

- Proposed two new benchmarks, GQA-LT & VG8K-LT, for solving the problem of long-tail detection in Visual Relationship Recognition(VRR) task.
- Implemented various baselines for the proposed benchmark. Also proposed two novel techniques, RelMix and VilHub, which can be used to improve on tail accuracy for a VRR model.
- A paper for the same is accepted at ICCV 2021. [**Project Page**]
- Organized a challenge using our proposed benchmark in the ICCV 2021 CLVL workshop. [**Challenge Page**]
- Proposed another method for rectifying the long-tail VRR task using a novel RelTransformer architecture along with a memory module. Tested the approach on various baselines and was able to improve upon almost all the models by approx 20% on tail classes.
- A paper for this work is accepted at CVPR 2022. [**Arxiv Link**]

LIVIA group, ETS Montreal *Montreal, Canada*

Reseach Internship | Prof Christian Desrosiers | Prof Jose Dolz *May 2019 - July 2019*

- Worked on the problem of semi-supervised medical image segmentation
- Developed a new architecture for solving the same inspired by the CycleGAN architecture and tested it on various datasets like VOC, Cityspaces and ACDC. The model was able to improve the previous SOTA models by 2-4% on the said datasets. [**Arxiv Link**] [**GitHub Link**].

Professional Experience

Microsoft *Hyderabad, India*

Data & Applied Scietist | MSAI *July 2022 - Present*

- Working with E+M Squad on the problem of Learning To Rank systems for message relevance.
- Experimenting on using a combination of Neural Net appproach along with FastRank models to further improve upon the LTR baselines. Also, experimenting with various dimensionality reduction techniques to further optimize on the feature stack.
- Proposed and experimenting on usage of alternative user signals for improving upon the current ground truth signals for better ranking.

Projects

Deep Learning for Novel View Synthesis *Roorkee, India*

Thesis Project *Jaunary 2022 - April 2022*

- Did a thorough literature review for GAN-based approaches used for view synthesis problem.
- Implemented ConditionalGAN and HoloGAN for the problem setting and reproduced their results.
- Also proposed a minor addition on top of HoloGAN by introducing sinusoidal activations to have a minor performance boost, termed as Holo-GAN++
- The full thesis report can be found here: [**Report Link**]

vGraph: A Generative model for joint community detection and node representational learning *Roorkee, India*

Under NeurIPS Reproducibility Challenge 2019 *October 2019 - November 2019*

- Implemented the paper along with reproducing the experiments and baselines reported in the paper under the reproducibility challenge. [**Github Link**]

Papers We Read *Roorkee, India*

Under Vision and Language Group *September 2019 - Jan 2020*

- Core Contributor to the repo containing summaries of the various CV/NLP papers accepted in top conferences, that are discussed in VLG. [**Github Link**]

LeDoc *Roorkee, India*

Selected for Inter IIT Tech Meet, 2018 held in IIT Bombay *December 2018*

- This is a project aimed to assist doctors in preliminary stages of Medical Image Analysis.
- The main purpose of the app is to segment out the affected region and also determine the severity of the disease. [**Github Link**]

Research project on medical image segmentation *Roorkee, India*

Under the supervision of Prof R. Balasubramanian, professor, Computer Science Department, IIT Roorkee *August 2018 - Nov 2019*

- Used clustering algorithms to segment out the affected region in the case of skin cancer and brain stroke.
- To further improve the results, various evolutionary algorithms like Genetic Algorithms, Particle Swarm Optimization and Whale Optimization were used along with usage of certain encryption techniques to maintain user privacy.

Achievements & Scholarships

2022	**Reviewer**, Serving as a Reviewer for CVPR 2023 conference	*India*
2018	**Participation**, Inter IIT Tech Meet in Engineer's Conclave Event	*Mumbai, India*
2018	**Scholarship**, Inspire Scholarship Fellow under the Ministry of Science and Technology	*Roorkee, India*
2018	**All India Rank 49**, In Amex Analyze This 2018(among the 800 participated teams)	*Roorkee, India*
2018	**Dedicated Member Award**, Awarded Dedicated member award by NSS, IIT Roorkee for my excellent work	*Roorkee, India*
2017	**All India Rank 4605**, Joint Entrance Exam(Advanced); 200,000 candidates	*India*
2017	**All India Rank 3751**, Joint Entrance Exam(Mains); 1,000,000 candidates	*India*

Extracurricular Activity

Vision and Language Group

Roorkee, India

Co-President

Oct 2018-PRESENT

- An open paper-discussion group on recent papers accepted in various ML/CV/NLP related conferences. [**Link**]
- Involved in overall planning of the group, including organizing and moderating paper discussions, contributing to projects, etc.

ACM IIT Roorkee Chapter

Roorkee, India

Treasurer

April 2019-PRESENT

- Served as the Treasurer for ACM IIT Roorkee Chapter, and was involved in conducting discussions pertaining to core-CS topics like Systems, Networking, etc. [**Link**]

Academic Reinforcement Programme

Roorkee, India

UGTA member

Aug 2018-Nov 2018

- Served as a Teaching Assistant for MAN-001 course taught to the freshmen batch.

NSS IIT ROORKEE

Roorkee, India

Editorial Team Member

Aug 2017-May 2018

- Organized various events like Swachh Bharat Abhiyaan, Cloth distribution drives and encouraged people towards the advantages of the same.

References

Prof Karthik Narsimhan

New Jersey, USA

Assistant Professor, Computer Science Department, Princeton University

- **Email:** karthikn@princeton.edu

Prof Mohamed Elhoseiny

Saudi Arabia

Assistant Professor, Computer Science Department, King Abdullah University of Science and Technology(KAUST)

- **Email:** mohamed.elhoseiny@kaust.edu.sa

Prof Christian Desrosiers

Montreal, Canada

Professor, École de Technologie Supérieure(ETS)

- **Email:** christian.desrosiers@etsmtl.ca

Prof Sanjeev Kumar

Roorkee, India

Associate Professor, Mathematics Department, IIT Roorkee

- **Email:** malikfma@iitr.ac.in