

# Aniket Agarwal

APPLIED MATHEMATICS UNDERGRADUATE · DEEP LEARNING ENTHUSIAST

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## Interests

My research interest domain mainly lies in the broader fields of Computer Vision and Natural Language Processing and their applications. I have a special interest in the field of Generative models and Graph networks along with making models robust and immune to adversarial examples. I am deeply interested in learning more about the theoretical aspects behind deep learning in general.

## Education

### Indian Institute of Technology Roorkee

INTEGRATED MSc APPLIED MATHEMATICS

- Cumulative Grade Point, CGPA:7.71/10

Roorkee, India

July 2017-Present

### Maharaja Agrasen Model School

PCM(ALONG WITH COMPUTER SCIENCE)

- Percentage:94.8%

New Delhi, India

March 2015-March 2017

## Publications

### RelTransformer: Balancing the Visual Relationship Detection from Local Context, Scene and Memory

JUN CHEN, ANIKET AGARWAL, SHERIF ABDELKARIM, DEYAO ZHU, MOHAMED ELHOSEINY

- Under Review
- ArXiv Preprint: [\[Link\]](#)

### Exploring Long Tail Visual Relationship Recognition at Scale

ANIKET AGARWAL\*, SHERIF ABDELKARIM\*, PANOS ACHLIOPTAS, JUN CHEN, JIAJI HUANG, BOYANG LI, KENNETH CHURCH, MOHAMED ELHOSEINY

- The paper is accepted for ICCV 2021
- ArXiv Preprint: [\[Link\]](#)

### Visual Relationship Detection using Scene Graphs: A Survey

ANIKET AGARWAL\*, AYUSH MANGAL\*, VIPUL\*

- The paper is under review in ACM CSUR journal
- ArXiv Preprint: [\[Link\]](#)

### Revisiting CycleGAN for semi-supervised segmentation

ARNAB MONDAL, ANIKET AGARWAL, JOSE DOLZ, CHRISTIAN DESROSIER

- ArXiv Preprint: [\[Link\]](#)

## Research Experience

### Research Project with NUS CVML group

UNDER THE SUPERVISION OF PROF ANGELA YAO, NUS

- Working on the task of 3D action recognition using various modalities such as depth map, joint information, etc.
- Specifically targetting on the problem of hand-action recognition, along with the pose estimation.

Singapore

Jun 2021 - Present

### Research Collaboration with CAIR group, KAUST

UNDER THE SUPERVISION OF PROF MOHAMED ELHOSEINY

- Developing a new Scene Graph Generation technique to get a more unbiased result by solving the problem of long-tail of infrequent relationships in datasets.
- Specifically developing further upon the ideas set up by paper 'Long-tail Visual Relationship Recognition with a Visiolinguistic Hubless Loss' for long-tail visual relationship detection.
- A paper of the work done for the same is also currently under review for ICCV 2021.

Saudi Arabia

May 2020 - Feb 2021

## Research Project on Steerable Networks

Montreal, Canada

UNDER THE SUPERVISION OF ARNAB K. MONDAL, PHD MCGILL UNIVERSITY

July 2020 - Sep 2020

- Developing upon the ideas presented in the paper 'General E(2)-Equivariant Steerable CNNs'.
- The main target is to adapt this framework for other downstream tasks such as image translation, super-resolution, etc. by exploiting the learning capacity of steerable networks.

## Research Project with LIVIA group, ETS Montreal

Montreal, Canada

UNDER THE SUPERVISION OF PROF JOSE DOLZ AND PROF CHRISTIAN DESROSIERS, ETS MONTREAL

May 2019 - July 2019

- Developed a new training procedure for semi-supervised segmentation using normal losses along with adversarial ones, with ideas inspired from CycleGAN model [\[GitHub Link\]](#).
- The model was thoroughly tested and experimented on various normal context and medical datasets.

## Research project on medical image segmentation

Roorkee, India

UNDER THE SUPERVISION OF R. BALASUBRAMANIAN, PROFESSOR, COMPUTER SCIENCE DEPARTMENT, IIT ROORKEE

August 2018 - March 2019

- Using 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.

## Projects

### vGraph: A Generative model for joint community detection and node representational learning

Roorkee, India

UNDER NEURIPS REPRODUCIBILITY CHALLENGE

October 2019 - November 2019

- Implementing the paper along with reproducing the experiments and baselines reported in the paper under NeurIPS reproducibility challenge 2019
- Github Repo: [Link](#)

### Papers We Read

UNDER VISION AND LANGUAGE GROUP

Roorkee, India

September 2019 - Present

- Core Contributor to the repo containing summaries of the various papers that we as a group have discussed
- Github Repo: [Link](#)

### LEDNet

Roorkee, India

SELF-INTEREST PROJECT

May 2019

- Implementation of LEDNet architecture in pytorch, a model for semantic segmentation with very few parameters
- Github Repo: [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 Repo: [Link](#)

## Achievements & Scholarships

2018	<b>Participation</b> , Inter IIT Tech Meet in Engineer's Conclave Event	Mumbai, India
2018	<b>Scholarship</b> , Inspire Scholarship Fellow under the Ministry of Science and Technology	Roorkee, India
2018	<b>All India Rank 49</b> , In Amex Analyze This 2018(among the 800 participated teams)	Roorkee, India
2018	<b>Dedicated Member Award</b> , Awarded Dedicated member award by NSS, IIT Roorkee for my excellent work	Roorkee, India
2017	<b>All India Rank 4605</b> , Joint Entrance Exam Advanced(among 150,000 candidates)	India

## Extracurricular Activity

### Vision and Language Group

Roorkee, India

CO-PRESIDENT

Oct 2018-PRESENT

- We conduct various open sessions for paper discussions on recent papers accepted in various ML/CV/NLP related conferences
- We also take up research projects on in collaboration with Professors from various universities with the aim of publication in various DL/CV/NLP conferences.
- Website: [\[Link\]](#)

### ACM IIT Roorkee Chapter

Roorkee, India

TREASURER

April 2019-PRESENT

- We are a bunch of Computer Science enthusiasts aiming at fostering a culture of research in the field of Theoretical Computer Science and its applications in various fields

## Academic Reinforcement Programme

UGTA MEMBER

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

*Roorkee, India*

*Aug 2018-Nov 2018*

## NSS IIT ROORKEE

EDITORIAL TEAM MEMBER

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

*Roorkee, India*

*Aug 2017-May 2018*

## References

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### Prof Mohamed Elhoseiny

ASSISTANT PROFESSOR, KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY(KAUST), SAUDI ARABIA

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

*Saudi Arabia*

### Prof Christian Desrosiers

PROFESSOR, ÉCOLE DE TECHNOLOGIE SUPÉRIEURE(ETS), MONTREAL

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

*Montreal, Canada*

### Prof Jose Dolz

ASSISTANT PROFESSOR, ÉCOLE DE TECHNOLOGIE SUPÉRIEURE(ETS), MONTREAL

- **Email:** jose.dolz@etsmtl.ca

*Montreal, Canada*

### Prof R. Balasubramanian

PROFESSOR, DEPT. OF COMPUTER SCIENCE AND ENGINEERING, IIT ROORKEE

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

*Roorkee, India*

### Arnab K. Mondal

PHD CANDIDATE, MCGILL UNIVERSITY

- **Email:** arnabm@cim.mcgill.ca

*Montreal, Canada*