

My Research Journey - Most Important Takeaways

IIITD, Research Assistantship

- Learnt Pytorch, first experience with large object detection code repositories. Customizing them to conduct experiments.
- Dataset challenges in wild unconstrained environments.

Bachelor's thesis project

Me and a friend set out to explore geometric deep learning purely out of interest, convinced our advisor and had a fun 10 months discussing papers and trying different Graph Neural Networks code repositories.

IBM Research Internship

- Collaboration of 5 students and lead them.
- Came across synchronization challenges in multi-modal data.
- Using engineering over research to solve an important social problem.
- Working with limited computational resources.

Short Term Goals

- Collaborate with other students for more active exchange of ideas and faster, effective research.
- Get a top tier publication at the intersection of continual learning and domain adaptation.
- Get a Teaching Assistantship opportunity.
- Learn meta-learning, self-supervised learning and reinforcement learning.
- Give a technical talk.

Summer 2019

2020-2021

Summer 2020

2021-2022

Research Internship, GREYC, CNRS, France

- What it takes to design a new architecture to solve an open ended objective. Innovation at the layer-level is harder. Hyperparameter tuning is a skill.
- Managing and prioritizing parallel experimentation of many architecture and optimization strategy combinations. Started documenting results and ideas.
- Learning from ideas that do not work to reach ideas that might. Only 1/8 architectures surpassed baseline on 1 dataset.
- Got to learn important fundamental concepts in deep learning.
- First attempt at an open-ended research problem and dealt with uncertainty in research for the first time.
- Made me proficient at Pytorch, developed confidence to modify and train any CNN architecture.
- Memorable French experience in a lab with people from all over the world.

CVIT, IIITH, Vision for Mobility Group

- Problem formulation: Learning to ask questions to papers and finding research gaps of interest. Writing down ideas and objectives before the bulk of the experimentation. **I learnt the importance of goal setting** in this project.
- Effective communication: taking a collaboration (of professors) along by connecting the old and new. Aim for concise and crisp presentations, with cogent discussions and defence! Only way to break out of deadlocks, escalate progress and turning around the fate of the project.
- It can be hard to even find starting points in a **yet unattempted, open-ended, multi-objective optimization setting**.
- Learning to take independent decisions to fix a few variables. Taking responsibility and driving the project, while getting the best from everyone on the team.
- Writing the paper and *making diagrams*. 1st paper submission.
- Approaching unexpected reviews from a positive and constructive perspective, helping the reviewers understand better. Adding technical elements that appeal to people outside of the niche.
- The importance of reading group culture.

Long Term Goals

- I want to go to graduate school to fill in gaps in my technical education, especially to take a few advanced mathematics and deep learning foundations courses. One can produce truly original research only with a deep understanding of such concepts.
- Understand how researchers identify at an early stage which projects are likely to result in wider, long-lasting impact.
- Conduct challenging research in an industrial lab, on an application directly impacting people. Currently interested in autonomous driving.
- White board brainstorming discussions with an excited team of interdisciplinary researchers.
- Experience work culture in different countries and travel.