V Pramodh **Gopalan**

· SOPHOMORE UNDERGRADUATE · COMPUTER SCIENCE AND ENGINEERING ·

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"Know that you don't know. That is superior."

Education

Indian Institute of Technology, Kanpur *Kanpur, Uttar Pradesh*
BACHELOR IN COMPUTER SCIENCE AND ENGINEERING *Jul. 2019 - Apr. 2023(Expected)*
- Cumulative Grade Point: 9.11/10.0 (4 semesters)

Ryan International School *Sanpada, Navi Mumbai*
SECONDARY SCHOOL *Apr. 2017 - Apr. 2019*
- Class 12 CBSE board percentage of 96.2 %

Academic Achievements

2019	**Academic Excellence Award**, Awarded to the top 10% in the batch for excellent academic record	*IIT Kanpur, India*
2019	**All India Rank 217**, among 200,000 candidates in JEE Advanced, 2019	*IIT Roorkee,India*
2019	**All India Rank 217**, among 1.5 million candidates in JEE Mains,2019	*NTA, India*
2019	**KVPY SX Scholarship Awardee**, Scholarship awarded by Indian Institute of Science	*IISc, Bangalore*
2019	**Appeared in INPho and INAO**, Selected to appear in the national level exams for physics and astronomy olympiads	*HBCSE, Mumbai*
2018	**Appeared in Indian National Math Olympiad (INMO)**, Participated in a training camp for appearing in INMO	*TIFR, Mumbai*
2017	**NTSE Scholarship Awardee**, Scholarship awarded by Government of India	*NCERT, New Delhi*

Research Experience

Defending Poisoning Attacks in ML *Northeastern University, Boston, Massachusetts*
ADVISOR: DR.ALINA OPREA *May 2021 - Present*
- Working on Defenses against poisoning attacks in Machine Learning
- Using ensembles of models to evaluate poisoning attacks
- Implement various models and check their effectiveness with diverse datasets

Image Preprocessing as an Adversarial Defense *Department of CS, IIT Delhi*
ADVISOR: DR.VIRESHWAR KUMAR *Aug 2020 - Jan 2021*
- Briefly examined CV based navigation models for Unmanned Aerial Vehicles to determine adversarial weaknesses.
- Read a variety of literature on Adversarial vulnerabilities from Nicholas Carlini's reading list.
- Implemented defenses like Learnable Encryptions and Random Tranformations to build defenses against attacks

Projects

Decentralized Mechanism Design using BlockChains *IIT Kanpur*
COURSE PROJECT: GAME THEORY & MECHANISM DESIGN, MENTOR - SWAPRAVA NATH [GITHUB REPO] *Aug. 2020 - Nov.2020*
- Used Blockchains as a source of decentralized mechanism to eliminate corrupt central parties.
- Used Game Theory to model games where privacy is a concern while using BlockChains.
- Used Secret Network and Secret Contracts to implement auctions while maintaing privacy.

Statistical Simulation

SEMESTER LONG PROJECT - MENTOR KUSHAGRA GUPTA *Mar 2021 - Present*

- Explored Various Estimation methods like Maximum Likelihood Estimation, Moment Estimators, MAP etc.
- Studied stochastic optimization techniques such as Newton Raphson, Gradient Descent, Simulated Annealing

A Study on GANs
Programming Club, IIT Kanpur

SUMMER LONG PROJECT, MENTOR - NIRMAL SUTHAR [GITHUB REPO] *May. 2020 - Jul. 2020*

- Studied convolutional neural networks in depth and implemented architectures like ResNET and VGG using Pytorch.
- Did a basic literature review on GANs and implemented basic GAN and DCGAN on MNIST and CIFAR-10 Datasets.
- Studied Context Encoders and implemented it using Pytorch.
- Studied Audio Generation using WaveGAN and tried implementing it using Pytorch.
- Wrote blogs mentioning related research papers,along with results and architectures.

Skills

Programming Languages : Python, C, C++, Julia, Shell(Bash)
Machine Learning frameworks and Libraries : Pytorch, Numpy, Scikit-Learn, Pytorch-Lightning, Flux.jl, MLJ.jl
Utilites : Git, LaTeX, Markdown, Jekyll, Docker, pip

Relevant Coursework

- Real Analysis   A*
- Fundamentals of Computing   A
- Discrete Mathematics for CS   A
- Data Structures & Algorithms   A
- Game Th. & Mechanism Des.   A

- Computer Organization   A
- Probability Theory
- Bayesian Analysis
- Machine Learning $^{\ddagger\,\S}$
- Reliable AI (ETH Zürich)‡

- Statistical Simulation §
- Numerical Methods §
- Operating Systems §

† - Ongoing   § - Upcoming   ‡ - Audited

Positions of Responsibility

Programming Club, IIT Kanpur
Programming Club IIT Kanpur

SECRETARY *June 2020 - present*

- Part of a team of about 20 students responsible for holding various events to the campus community of more than over 8000 students.
- Conduct and give talks and lectures on selected topics to interested students

Counseling Service IIT Kanpur
IIT Kanpur

STUDENT GUIDE *Aug. 2020 - present*

- Mentoring six freshmen throughout their first year and exposing them to academic and extracurricular opportunities available in the institute

Julia for Machine Learning
IIT Kanpur

PROJECT MENTOR *March 2021 - present*

- Introduced the Julia, A High Performance Computing Language to about a group of 30 students
- Took Lectures on various aspects of Julia, Such as Multiple Dispatch, Type Inference and Loop Fusion
- Introduced them to fundamental concepts in Machine Learning such as Probability and Statistics, Numerical Differentiation, Gradient Descent etc.