Varun Desai

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EDUCATION

Indian Institute of Technology, Delhi — **August, 2018 - May, 2022**

Bachelor of Technology in Electrical Engineering, GPA 9.625/10.0.

- Relevant Courses: Intro to Computer Science, Intro to Electrical Engineering, Data Structures and Algorithms, Computer Architecture, Intro to Machine Learning, Special Topics in Artificial Intelligence, Signals and Systems, Synthesis of Hardware Systems, Digital Electronics, Probability and Stochastic Processes

SCHOLASTIC ACHIEVEMENTS

- **IIT Delhi Silver Medallist:** Department Rank 1, out of more than 100 students, after 8 semesters.
- **IIT Delhi Semester Merit Award:** For outstanding academic performance, for 4 out of 8 semesters.
- **JEE Advanced 2018**: Achieved All India Rank of 301, achieved AIR 2200 in JEE Mains 2018
- **KVPY 2018**: Conferred fellowship via 2-step process by Department of Science and Technology, India

PUBLICATIONS

On-chip Learning of a Domain-Wall-Synapse-Crossbar-Array-Based Convolutional Neural Network

Varun Bhavin Desai et al, 2022. Neuromorphic Computing and Engineering Vol. 2, 024006.

- Designed crossbar array architecture for novel neuromorphic synaptic device to facilitate on chip learning for a convolutional neutral network. Analysis of robustness against noise and other non idealities also performed.

WORK EXPERIENCE

Quantitative Researcher, Graviton Research Capital — **June, 2022 - Present**   *Gurugram, India*

- Researched upon and developed predictive trading signals, which exploit inefficiencies in the market, to be used for algorithmic trading at a high frequency trading firm.
- Work involved exploratory data analysis using C++ and python.

Hardware Verification Intern, APT Portfolio — **May, 2021 - July, 2021**   *Bangalore, India*

- Designed, tested architecture for emulating RTL model on an FPGA to speed up verification process more than 100x
- Developed digital circuit using Verilog to (de)serialise data to and from compressed format for efficient transmission

Computer Vision Intern, Greenleap Robotics — **May, 2020 - July, 2020**   *New Delhi, India*

- Implemented ML based Computer Vision techniques to automate fault diagnosis of Solar Panels via Drone Imagery
- Mask-RCNN used to localise solar panels in aerial drone-shot thermal images, clustering algorithm (DBSCAN) used to detect temperature hotspots as statistical outliers, achieved over 90% precision and recall on test dataset.

Teaching Assistant, Signals and Systems (ELL205), IIT Delhi - January, 2022 - May, 2022   *New Delhi, India*

- Teaching assistant for Undergraduate course on Signal Processing. Responsible for organising tutorial sessions and grading mid-terms and finals. Course was later nominated as best-taught course in the semester.

RELEVANT PROJECTS

Capacitated Vehicle Routing Problem, i4 Challenge, Winner — May, 2020
- Capacitated Vehicle Routing formulated as an **Integer Programming** problem; Researched existing solutions and improved upon them - Developed attractive, aesthetic front-end for various stakeholders.
- Awarded **best solution** after evaluation by Professors & experts in the field, out of **70**+ **submissions**

Planning and Estimation for Autonomous Systems — **Prof. Rohan Paul**, January, 2021 - April, 2021,
- Implemented value iteration for solving an MDP, **reinforcement learning** algorithms(SARSA,Q-learning); Viterbi Algorithm for **HMMs** also implemented.
- Devised algorithm for estimating position of multiple agents with no data association as an extension to **Kalman Filtering**

Data Structures and Algorithms - Prof. Subodh Kumar, August, 2019 - November, 2019
- Approximated 3D objects as collection of triangles: **Graph** used to store the triangles as nodes and vertices as edges.
- BFS, DFS, **Dijkstra's Algorithm** implemented for answering various queries about orientation of objects.
- Implemented **Double Hashing**, and separate chaining using binary search trees from scratch on Java, to decrease lookup time

SKILLS

Python, C(++), Java, LaTeX, SystemVerilog, VHDL, Adobe Creative Suite

POSITIONS OF RESPONSIBILITY AND EXTRA CURRICULAR ACTIVITIES

Station Manager, IIT Delhi OnAir — July 2021 - May 2022
- Managed team of 30+ people, generated 10M+ hits on YouTube, producing diverse content for campus community
- Collaborated interviews with Netflix, TVF for interviews with cast of Alma Matters, a Netflix Special
- Innovated yearly operations in the online semester, leading to a 98% YoY increase in views

Graphic Designer, Board for Student Publications, IIT Delhi — July 2021 - May 2022
- Brought out campus issues creatively, used aesthetic designs, creative infographics in magazines and articles
- Awarded Best Technical Editor award, as recognition for punctuality and quality of work

Director(Video Editing), Photography and Films Club, IIT Delhi — July 2021 - May 2022
- Reinforced the culture by conducting video editing workshops, tutoring freshmen and providing guidance in club events. Conferred award for Significant Contribution to the Club.
- Conceptualised, designed and organised an institute wide graphic design marathon twice, co-founded Design Club, IIT Delhi.

- Winner: Inter Hostel Ad Making, Inter Hostel Group Dance. (IIT Delhi)
- Runner Up: Photography and Films Club Trophy, Inter Hostel Music Video (IIT Delhi)