VARUN BHAVIN DESAI

ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	B.Tech in Electrical Engineering	Indian Institute of Technology, Delhi	9.606
2018	CSBE	DPS Bopal, Ahmedabad	93.4%
2016	CBSE	DPS Bopal, Ahmedabad	10

SCHOLASTIC ACHIEVEMENTS

- **Department Rank 2**, *Electrical Engineering Department*: on the basis of CGPA after 6 semesters, out of 90+ students
- **Honoured with IIT Delhi Merit Prize** four times consecutively: For outstanding academic performance in Semesters-I, II, III, IV
- **Kishore Vaigyanik Protsahan Yojana(KVPY 2018)**: Conferred fellowship through 2-tier process by DST, Govt. of India
- **Awarded Certificate of Merit** by DPS Bopal and CBSE for consistent academic excellence; outstanding performance in AISSE

INTERNSHIPS

• **APT Portfolio Pvt. Ltd., Bangalore** : *RTL Design and Verification*, FPGA-based Simulation Acceleration [May,2021-July,2021]
- Ideated, designed, tested architecture for emulating **RTL** model on an **FPGA** to speed up verification process more than **100x**
- Developed and tested digital circuit using **Verilog** to (de)serialize data to and from compressed format for efficient transmission
- Used **Riviera-PRO** and Cocotb to debug and test design, Xilinx **Vivado** for synthesis and ensuring timing requirements

• **Greenleap Robotics, Delhi** : *Automated Fault Diagnosis of Solar Panels* [May, 2020 - July, 2020]
- Implemented Machine Learning based **Computer Vision** techniques along with statistical methods to automate fault diagnosis
- Trained a **ConvNet** with state of the art architecture(**Mask-RCNN**) to localize solar panels in aerial drone-shot thermal images
- Used Image Processing and Unsupervised Learning(**DBSCAN algorithm**) to detect temperature hotspots as statistical outlierss
- Achieved over **90%** precision and recall on test dataset; developed simple **frontend** using python libraries such as tkinter

PROJECTS

• **Analog ConvNet** | *Prof. Debanjan Bhowmik, Neuromorphic Training Accelerator* [January, 2021-Present]
- Matrix multiplication occurs in O(1) time in a **crossbar array** but with volatile **transistors** various non-idealities hinder scalability
- Introduced **weight decay** of the synaptic device while training by mathematically modelling the decay curve; used **tensorflow**
- Experimented with different **quantization** precision, rate of decay, and distributing the weight between volatile and non-volatile devices

• **Navigo**: *Winner, i4 Challenge by IIT Delhi*; Solution for problem posed by IRD, IIT Delhi [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; highlights path taken for every agent; used **JS**, Flask
- Awarded **best solution** after evaluation by professors & experts in the field, out of **70+ submissions** for 28 proposed problems

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

• **Machine Intelligence & Learning** | *Prof. Prathosh AP* [August,2020-January,2021]
- EM for GMM implemented, Used **PCA** for dimensionality reduction on Medical MNIST dataset, reduced convergence time
- Neural Net(L1 and L2 regularization), LeNet, AlexNet, VGG-16 trained with Adam Optimizer using **PyTorch** on HPC, IITD

• **Blind Source Separation** | *Prof Lalan Kumar, Digital Signal Processing* [March, 2020]
- Implemented Independent Component Analysis algorithm to separate a mixture into original sources with no prior information
- Investigated different approaches to ICA namely MLE, maximising Kurtosis or Neg Entropy; Implemented **Fast-ICA** in MATLAB

• **Triangulation of 3D Objects** | *Prof. Subodh Kumar, Data Structures and Algorithms* [November, 2019]
- Approximated 3D objects as collection of triangles: **Graph** used to store the triangles as nodes and vertices as edges.
- Breadth/Depth First Search, **Dijkstra's Algorithm** implemented for answering various queries about orientation of objects

• **Priority Based Job Scheduler** | *Prof. Subodh Kumar, Data Structures and Algorithms* [October, 2019]
- Implemented **Double Hashing**, and separate chaining using binary search trees from scratch on Java, to decrease lookup time
- Implemented a Job Scheduler, which stores jobs in a **MAXHEAP** and executes them on basis of it's projects priority

TECHNICAL SKILLS

Langauges: Python, (System)Verilog, MATLAB, Java, C, SML | **Tools**: LTSpice, KiCAD, Aldec Riviera-PRO, Arduino, Quartus

POSITIONS OF RESPONSIBILITY

• **IITD OnAir**:Production Manager,Production Head; *Official Media and Coverage Body of IIT Delhi* [March, 2019 - July, 2021]
- Managed a team of 20+ people, generated **10M+** hits on YouTube by producing diverse content including **20+ videos**
- Innovated the yearly operations for the online semester, achieving **98%** YoY increase in watch-time and **71%** YoY increase in views
- Coordinated collaborations with **Netfilx, TVF** for live interviews with cast of Netflix Special **Alma Matters**, **Aspirants**; **6M+** impressions

• **Board for Student Publications**: Recognized as **Best Technical Editor** for punctuality and quality of work [April, 2019- August,2020]

Disclaimer: All the information on this page is entered by student.

VARUN BHAVIN DESAI

IIT COURSE

Degree	Institute	CGPA
B.Tech in Electrical Engineering	Indian Institute of Technology, Delhi	9.606

QUALIFYING EXAM

- **Joint Entrance Examination (JEE) Advanced Rank:** 301 AIR

COURSES DONE

Linear Algebra & Diffe. Equa., Intro. To Computer Science, Intro. To Electrical Engg., Calculus, Data Structures And Algorithms, Digital Electronics, Circuit Theory, Signals And Systems, Control Engineering I, Digital Signal Processing, Analog Electronic Circuits, Communication Engineering, Digital Hardware Design, Machine Intelligence& Learning, Computer Architecture, Spl. Topics In Artificial Int.

POSITIONS OF RESPONSIBILITY

- Photography and Films Club Representative Udaigiri, Hostel (May, 2019 - April, 2020)
- Production Manager, Production Manager (January, 2021 - March, 2021)
- Director(Video Making), PFC Directors (November, 2020 - July, 2021)
- Co-Founder, Co-Founder (January, 2021 - March, 2021)
- Production Head, IITD OnAir (May, 2019 - April, 2020)
- Activity Head, Literati (June, 2019 - October, 2019)
- Technical Editor, BSP (May, 2019 - May, 2020)

EXTRA CURRICULAR ACTIVITIES

- Creative Team Achead & Coverage Team Head, Sportech'19 BSA (January, 2019 - March, 2019)
- Best Technical Editor, Board for Student Publications 2019-2020 (September, 2020)
- Runners Up, Inter-Hostel Music Video Competition (February, 2020 - March, 2020)
- Runners Up, Inter- Hostel Photography Competiton (December, 2019 - May, 2020)
- First, Inter Hostel Group Dance Competition 2020 (January, 2020 - March, 2020)
- Second Runners Up, Inter-Hostel Broll Challenge (January, 2020 - May, 2020)
- Winner, Inter-Hostel Ad-Making Competiton (September, 2019 - March, 2020)
- FirstDesign Marathon Udaigiri, Intra Hostel (July, 2018 - April, 2019)
- SecondInstrumedley Udaigiri, Intra Hostel (July, 2018 - April, 2019)
- Team Leader, Fresher's League (December, 2020 - July, 2021)
- Executive Member, Timeline Films (April, 2019 - April, 2020)
- Significant Contribution, PFC Awards 20-21 (June, 2021)
- Second Position, PFC Trophy 2019-20 (July, 2021)
- Member, Timeline (November, 2020 - July, 2021)
- Second, Football Inter Hostel (January, 2019)
- First, Design Revolution (February, 2019)
- 3rd, Symphonia'20 (March, 2020)