Divyansh Ahuja | CV

Contact Information

Senior Undergraduate
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Education

Indian Institute of Technology (IIT) Bombay, Mumbai, India
Dual Degree (B.Tech+M.Tech), Electrical Engineering, *Expected:* Summer 2022

- **Minor** in Industrial Engineering
- **Cumulative Performance Index (CPI)**: 8.7/10.00

Academic Achievements

- **All India Rank 482** in JEE Advanced 2017 among 220,000 students
- **All India Rank 1263** in JEE Main 2017 among 1.18 million students
- **Awarded** first rank in intra school round of Conquest I.Q. Olympiad in 2014
- **Awarded** Gold medal for securing first rank in school round of SOF's 5^{th} International Mathematics Olympiad and qualified for the final round of IMO

Work Experience

- **Software Development Engineer** July'22 - Present
  HiLabs India
  - Worked on developing the User Interface for the product on .NET core framework.
  - Developed classification models to detect free hand text in provider files to detect incompatibility.
- **Applied Scientist Intern** May'20 - Aug'20
  Amazon India | Popup Detection and identification of user actions for closing the popup
  - Implemented NLP based Classifiers for detection of a popup from a given webpage by tokenising HTML documents using XPaths
  - Designed binary classification models to detect popups in a webpage using features extracted from CSS selectors
  - Implemented a detection mechanism using template matching algorithm for detecting the close button of popups
- **Modem Systems Engineering** 2020
  Qualcomm
  - Designed Digital Low Pass Filters for signal decimation to overcome aliasing effect in IOT devices
  - Used various design techniques like Parks McClellan algorithm, kaiser window method, least squares method, for filter design
  - Analysed and documented the performance of the designed decimation filters by studying the Frequency Domain Response of the filter
  - Analysed the different filters' robustness to noise using metrics like SNR and SQNR

Projects Undertaken

- **Optimizing agents in Social Networks** 2018
  Prof. Subhasis Chaudhary|Computer Vision(Course Project)
  - Estimated the **depth map** from the given image of an object using 'shape from shading' method.
  - **Compared** the effect on shape(depth map) of varying the several parameters in the code
  - **Estimated** the **disparity map** from two stereo images using the 'shape from stereo' method in **python**

- Used the disparity map to find the depth map

- **Estimating depth map from traditional Computer vision methods** 2018
  Prof. Subhasis Chaudhary|Computer Vision(Course Project)
  - Estimated the **depth map** from the given image of an object using 'shape from shading' method.
  - **Compared** the effect on shape(depth map) of varying the several parameters in the code
  - **Estimated** the **disparity map** from two stereo images using the 'shape from stereo' method in **python**
  - Used the disparity map to find the depth map

- **Image Deblurring** Feb'21 - May'21
  Prof. Ajit Rajwade | Image Processing(Course Project)
  - Implemented deblurring of images using reverse heat equation and stabilization in MATLAB.

- **Cascading bandit algorithms** Feb'21 - May'21
  Prof. Manjesh Hanawal | Online Learning(Course Project)
  - Studied, analyzed and implemented existing **Cascading bandit algorithms** in **python** where the goal is to recommend K most attractive items from a large set of L candidate items
  - **Compared** the performance of the algorithms by tweaking the parameters.
  - Compiled a 20 page documentation presenting the problem statement and the results, and proposed a few variants of existing algorithms

- **General Purpose Computing System(IITB proc)** Feb'21 - May'21
  Prof. Virendra Singh| Course Project
  - Designed a 16bit **computing system** using vhdl, using point to point communication infrastructre
  - Implemented **14 instructions** in machine-code instruction formats (R, I and J type)
  - Performed operation of adding content of registers, nand operation, loading and storing operations in the memory and jump operations to an address in the memory

- **All-SAT solver** Feb'21 - May'21
  Prof. Virendra Sule| Course Project
  - Implemented an implicant based Recursive all solution solver for Boolean satisfiability
  - Optimized the implementation of the SAT solver using multi-threading, thereby reducing the run-time of algorithm

- **Deep Reinforcement Learning in Algorithmic Trading** Feb'22 - May'22
  Prof.Hemachandra| Course Project
  - Studied, analysed and implemented existing Deep Reinforcement Learning algorithms for algorithmic trading using OpenAI framework in python.
  - Compiled a 20 page documentation presenting the problem statement and the results, and proposed a few variants of existing algorithms

- **General Purpose Computing System(IITB proc)** Feb'19 - May'19
  Prof.Virendra Singh| Course Project
  - Designed a 16bit **computing system** using vhdl, using point to point communication infrastructre
  - Implemented **14 instructions** in machine-code instruction formats (R, I and J type)
  - Performed operation of adding content of registers, nand operation, loading and storing operations in the memory and jump operations to an address in the memory

- **Few-Shot Image Generation** Feb'21 - May'21
  Prof.Biplab Banerjee| Supervised Research
  - Designed and implemented a Few-shot Meta-learning based conditional image generation method using Proto-typical Networks.
  - Trained the prototypical networks coupled with CGAN using Prototypical loss, GAN loss using Tensorflow
  - Implemented Inception score and Fréchet Inception Distance to evaluate the quality of generated images.
  - Experimented with various loss functions and fine-tuned hyper-parameters to get the optimal Inception Score for generated images

- **Camera Readout Electronics** Feb'20 - May'20
  Prof. Rajbabu| Electronics Design Course Project

- Designed the analog processing circuit for the camera to read output from the image sensor array.
- Implemented the readout of OV7670 camera on Arduino using I2C communication protocol

Technical Skills

Programming C++, C, C, Bash, Python, Java, HTML, CSS, Javascript, JQuery, React.js, Node.js, .NET6, OpenGL, Cmake, VHDL

Software PyTorch, Matplotlib, TensorFlow, MATLAB, Git, LaTeX, OpenCV, Solr, MongoDB, MySQL, GraphQL, Fast API

Positions of Responsibility

Served as an undergraduate teaching assistant for followig courses, assisting the professor with smooth functioning of the course, contributing to the content matter and course resources as well as assisting in conducting the evaluation of the course

- **EE 337 Microporcessors Lab** *Spring' 22*
- **EE 659 Optimization** *Autumn'21*
- **PH108 Electrodynamics** *Spring'21*
- **PH107 Quantum Physics** *Autumn'18*

Extra-Curricular Activities

- Completed **80 hours of community service** involving ideation and implementation of solutions to social problems.
- Performed in **Republic day Celebration** in front of about 500 strong audience comprising The Dean, professors, and students, to encourage toadopt eco-friendly measures
- Successfully completed **Machine Learning** course(authorized by Stanford University) and **Introduction to TensorFlow for AI** course(authorized by DeepLearning.AI) on coursera