

# Yashvardhan Didwania

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## EDUCATION

### Indian Institute of Technology, Bombay

Dual Degree (B.Tech + M.Tech), Electrical Engineering

Minor, Computer Science & Engineering

July 2016 - June 2021

CPI - 8.92

CPI - 9.0

### Delhi Public School Megacity, Kolkata

Indian School Certificate Examination (ISC)

April 2016

95.60%

## RESEARCH & DEVELOPMENT EXPERIENCE

### Cost Optimality for Crowd-Labelling Platforms

[Jan '20 - Present]

Master's Thesis | [Prof. Jayakrishnan Nair](#)

- Reviewed Spectral techniques for **statistically efficient** parameter estimation in Latent variable models by extracting an orthogonal **tensor decomposition** from their low-order observable moments (variance, **skewness**, **kurtosis**)
- Developed sufficient conditions on **pricing model** of agents' quality to ensure expected cost is unimodal in price
- Designed a new algorithm to achieve desired prediction accuracy with **upper confidence bounds** on excess cost

### Linear Bandits - Dynamic Pricing

[Aug '19 - Dec '19]

Advanced Concentration Inequalities | [Prof. Sharayu Moharir](#) [Report]

- Multi-Armed Bandit is a problem in which resources must be allocated dynamically between competing choices
- Modelled the **linear demand curve** of a constrained resource as a Linear Bandit with a known **rejection budget**
- Designed a novel algorithm to take advantage of **negative price elasticity** of demand and generate **higher revenue**

### NeurIPS 2019 Pommerman Challenge

[Aug '19 - Dec '19]

Foundations of Intelligent and Learning Agents | [Prof. Shivaram Kalyanakrishnan](#) [Report]

- Investigated several strategies for multi-agent learning and the advantages of **Imitation Learning** over self-play
- Implemented a **Multi-Agent Deep Deterministic Policy Gradient** (MADDPG) Actor-Critic Model in **PyTorch** for this competitive - cooperative setting with partial observability and communication between a team of 2 agents

### Momentum Factor based Long-Short Equity Strategy

[May '20 - Aug '20]

Carried out experiments in the research environment provided on Quantopian

- Adjusted weights in an existing strategy on the platform to **improve sharpe** from 1.56 to **2.05** since January 2020
- Modified the method of computing momentum factor to reduce beta with **6% higher returns** and equal leverage

### Application Management System, IIT Bombay - <https://ams.iitb.ac.in>

[Jul '20]

Guide: [Prof. S. Sudarshan](#) - Angular, PHP, MySQL, Redis

- Conceptualized a **digital-signature** based highly adaptable solution to digitize workflows in a decades-old system
- Worked in a team for implementation and productionization in an emergency response to the COVID-19 pandemic
- Implemented **canvas animations** in Angular to allow annotating the pdf with comments and **signature stamps**

## PROFESSIONAL EXPERIENCE

### Google Summer of Code - Mozilla Corporation

[May '18 - Aug '18]

Guide: [Jonas F. Jensen](#), Staff Platform Engineer, Mozilla - Node.js, Golang [Blog] Mumbai, India / San Francisco, USA

- Worked on **Pulse**, a **RabbitMQ** cluster which provides loose coupling between automation and infrastructure tools
- Built the Pulse-inspector for **Taskcluster**, the CI/CD tool for **Firefox**, to allow instant subscription to **AMQP exchanges**
- Implemented the **Server-Sent-Events** protocol to maintain an **event stream** and proxy AMQP messages to browser
- Invited to Mozilla's All Hands in California and Florida to discuss the future development and adoption of Taskcluster

### Security Engineer, Sony Corporation

[May '19 - Jul '19]

Application Security and Vulnerability Management

Tokyo, Japan

- Created an **Application Security Laboratory** with Burp Suite, networking tools and few vulnerable applications
- Dockerized** the entire setup to enable experimentation in a sandbox within the internal proxy network restrictions

### Lend-It - An online book sharing platform

[Jun '17 - Dec '17]

Semi-Finalists at **Eureka 2017**, IIT Bombay - Asia's largest Business Model Competition

Mumbai, India

- Implemented **REST** APIs on Django and used Google Books API to allow users to easily add new books by ISBN
- Used **Facebook's Graph API** to connect with existing and **trusted borrowers** within the lender's social network

## LEADERSHIP

### Manager, Web and Coding Club - <https://wncc-iitb.org> | <https://insti.app>

[Apr '18 - Mar '19]

- Led a team of **20** for one of the biggest college clubs, to cultivate a hobbyist programming culture in the institute
- Initiated and led the **product design** of **InstiApp**, a common platform for all student activities with **8000+ users**
- Founded** the **Developers' Community** to pioneer the development of high impact projects within the institute
- Developed an Internship Portal in Django to connect startups and professors with students seeking internships

- Guided **100+** first-year students in making their first app in **MIT Scratch** and conducted **git & Android** workshops
- Founding Member of the **GSoC Incubation Cell** to guide students and encourage more participation in GSoC

#### Institute System Administrator

[Jun '20 - Present]

- Leading a 16-member SysAd team as the interface between IITB Computer Center and students across the institute
- Managing the entire student software infrastructure in **LXC virtualization** while ensuring high availability

#### Overall Coordinator, Developers' Community

[Jun '20 - Present]

- Leading the community of software developers with a 3-tier student technical team to accomplish several projects
- Working on solutions to make Hostel & Room Management centralized in the wake of the COVID-19 pandemic

## TECHNICAL PROJECTS

### CodePiece - Modular HTML5 framework for Card Games

[Dec '18]

Awarded **Gold** medal at the Jio Hackathon, Inter-IIT Tech Meet 2018 [Code]

- Built a framework with a highly **configurable ruleset** for playing multiplayer card games on mobile phones
- Built an Android app for each player to use as an individual **soft controller** with his private cards and set of actions
- A **Node.js** central server acts as the table to manage and sync the state of all the connected devices with REST APIs

### DodgeHole - Gamified Crowdsourcing through Ride-hailing Apps

[Dec '19]

Awarded **Silver** medal at the Coding Hackathon, Inter-IIT Tech Meet 2019 [Code]

- Implemented **pothole detection** on the driver's app and developed a game based on their number and location
- Crowdsourced and verified pothole data through **in-game decisions** of the rider by implementing stamp rewards
- Estimated **truthfulness** of a rider against the average response to **optimize task allocation** and save reward costs

### Mortal Multi-Armed Bandits

[Jan '20 - Jun '20]

Introduction to Stochastic Control | Prof. Jayakrishnan Nair [Report]

- Studied algorithms for **pay-per-click** in online advertising platforms with a fixed budget on number of clicks per ad
- Extended an algorithm to be **horizon-oblivious** and provided formal **improved lower bounds** on expected revenue

### Token Curated Registry - CourseReviews

[Aug '19 - Dec '19]

Cryptocurrency and Blockchain Technologies | Prof. S. Vijayakumaran [Code]

- Used **ERC20** based tokens to build a decentralized app for curating the reviews of institute courses and professors
- Implemented a **smart contract** where each entry can be challenged and then voted to be whitelisted on the registry

### RISC based Microprocessor Design

[Jul '18 - Dec '18]

Microprocessors | Prof. Virendra Singh

- Designed, and programmed on **Quartus**, a **6-stage pipelined 16-bit RISC processor** with a set of 15 instructions
- Implemented **hazard mitigation** and verified the processor on Altera Cyclone IV-E **FPGA** and Signal Tap Analyser

### ECG Compression using JPEG2000

[Jan '19 - Apr '19]

Digital Signal Processing | Prof. Vikram Gadre

- Contributed to **Make in India** initiative and proposed an application of ECG compression for rural healthcare
- Proposed a technique that used the periodicity of ECG signals to reconstruct it from samples with minimal loss

## ACHIEVEMENTS & AWARDS

- **JEE Advanced 2016 - AIR 415** | **WBEE 2016 - Rank 1** | **KVPY 2016 - AIR 465**
- Awarded the **Institute Organizational Colour** in 2018 for exceptional contributions to the student community
- Awarded **AA** grade in **Economics, Advanced Machine Learning** and **Probability and Random Processes**
- **National Top 1%** (among 40,000) in the preliminaries for the Indian National Chemistry Olympiad (InChO)

## KEY COURSES & SKILLS

<b>Computer Science</b>	Advanced Machine Learning, Computer Graphics, Data Structures & Algorithms, Design & Analysis of Algorithms, Automata Theory, Foundations of Network Security & Cryptography
<b>Probability Theory</b>	Advanced Probability, Stochastic Control, Games & Information, Random Graphs
<b>Others</b>	Optimization, Capitalism, Economics, Psychology, Optimization, Processor Design
<b>Languages &amp; Tools</b>	PyTorch, Redis, TensorFlow (Basic), Python (+Django, NumPy, Pandas), Julia, Golang, PHP, C/C++, JavaScript (+Angular, TypeScript, Node.js), Bash, $\text{\LaTeX}$

## EXTRA CURRICULARS

- **Teaching Assistant** for the course Probability and Random Processes in Autumn 2020
- Completed a Udemmy course on **Algorithmic Trading & Quantitative Analysis** Using Python
- **Tournament Winner** of **Texas Hold'em Poker** Night among 150+ students organized by Mood Indigo, 2016
- Secured **1st** position in Stratazenith, a **game theory** based event conducted by IGTS in Techfest, 2017
- Member of the Best freshmen team at **Logic GC 2016** conducted by Maths and Physics Club
- Completed a two semester course offered by National Sports Organization in Squash
- Successfully completed a Level A1 Chinese course in June 2011

**Interests:** Reading (Philosophy, Design, Personal Development), Writing, Music (EDEN, Pink Floyd), Poker and Trading