# Mani Tyagi

+91 9873601059
ce1170122@iitd.ac.in
Portfolio Website

## EDUCATION

**IIT DELHI**
BS in Civil Engineering
Jun 2017 - Present | New Delhi
Indian Institute of Technology Delhi

**CAMBRIDGE SCHOOL**
CS and Mathematics
Grad. 2016 | Noida, India
XII CBSE GPA : 93 / 100

## LINKS

Github:// **outmanipulate**
LinkedIn:// **mani.tyagi**
Codechef:// **outmanipulate**
Codeforces:// **outmanipulate**

## COURSEWORK

• Data Structures and Algorithms
• Machine Learning
• Probability and Statistics
• Calculus and Differential Equations
• Number Theory

## SKILLS

**SOFTWARE DEVELOPMENT**
• C++14• Python • Javascript
• MATLAB • MongoDB
• React Native • NetBeans
• MySQL • HTML • CSS

**MACHINE LEARNING**
• Basics : Gradient Descent, Regression, ANN, Natural Gradient
• Reinforcement learning : Q-Learning, DQN, Vanilla Policy, Actor-Critic
• Natural Language Processing
• Tensorflow • Keras

## PUBLICATIONS

• Impact of Lockdown in Air Contamination Levels of New Delhi

## ECA

• Poker - Over 17,000 USD Total Winnings
Pokerstars Profile:// **outmanipulate**
• Debating : APD  BP
Broke in Intra IIT APD

## EXPERIENCE

**UNIVERSITY OF SYDNEY | RESEARCH INTERN**
May, 2018 – Aug, 2018 | Sydney, NSW, Australia
• Implemented **reinforcement** techniques like **Q learning** and **policy iteration** using **MCMC sampling** and **parallel tempering** on atari games like cartpole.

**CODECHEF  | Programming Eduacator**
July, 2020 - Present | New Delhi, India
• Made video **editorials** on various **data structures** and problem solving paradigms like Greedy, **Dynamic Programming**, Bitwise operations, Sparse Table, Fenwick Trees, Segment Trees, **Minimum Spanning Trees** etc.

## PROJECTS

### BLACK-SCHOLES DELTA HEDGING
• Established and maintained an effective **risk-free portfolio** of **Europian options** by using **Black Scholes** model to calculate the delta every tick and rapidly **rehedging** on the basis of that delta.
• Modelled underlying asset using **Geometric Brownian Motion** and the derivative pricing using **binomial trees**.

### EARLY EARTHQUAKE DETECTION (MICROSOFT)
• Applied **Logarithmic Regression** on characteristic features of **P-waves** and redicted the final magnitude of the incoming **Earthquake** 3-7 minutes early.
• Determined whether buildings would be able to withstand the **shear stress** of that magnitude using **Rao's formula**

### FACE MASK DETECTION
• Wrote a python script to run on live video streams to **detect** whether the person is wearing a **face mask** with the test data accuracy of over **96 percent**.
• Built the framework using **Keras**, **TensorFlow**, **OpenCV** and **MobileNET**.

### STOCK PREDICTION USING NLP AND BERT
• Harnessed Google's **BERT** model for **contextual language processing** on publicly available **SEC 8-K forms**
• **Predicted** and correlated the **SnP 500** by overcoming drawbacks of **directional** models with **MLM** and **NSP**

### CBS CASE STUDY COMPETITION : CALRSBERG
• Consulted on how **Carlsberg** can further disrupt traditional on-trade channels in order to digitally engage with consumers and **increase revenue growth** to **5 percent** in Europe by 2022.

## NOTABLE ACHIEVEMENTS

| | |
|---|---|
| 2017 | Secured 99.94 percentile in **JEE** among 1.2 million students |
| 2017 | National Negotiation Table 2017 **Investment Bank** Winner |
| 2018 | **WorldQuant** Alphathon **Silver** Medalist |
| 2019 | Secured 6500 USD scholarship for **research fellowship** at **University Of Sydney** |
| 2019 | **Microsoft Codefundo ++** Hackathon Runner Up |
| 2020 | Secured 1st position in International  **Codechef Creator** contest |
| 2020 | Secured 592 rank in **Google Kickstart** |