

# Tathagat Verma

Fourth Year Computer Science Undergraduate, IIT Bombay

🌐 [tathagatv.github.io](https://tathagatv.github.io) | [in linkedin.com/tathagat](https://www.linkedin.com/in/tathagat) | [github.com/tathagatv](https://github.com/tathagatv) | ✉ [tathagatswagverma@gmail.com](mailto:tathagatswagverma@gmail.com)

## EDUCATION

**Indian Institute of Technology Bombay**, Mumbai, India  
*BTech. in Computer Science and Engineering with Honors*

July 2018 - July 2022(expected)  
CPI - **9.64/10**

## SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 53** in **JEE Advanced** out of 200,000 candidates 2018
- Secured **All India Rank 34** in **JEE Main** out of 1.2 million candidates 2018
- Recipient of the **Quadeye Excellence Scholarship**, awarded on the basis of academic achievements 2021
- Amongst top **35** in India selected for the **International Mathematical Olympiad Training Camp** 2017
- Amongst top **30** in India selected for the **International Astronomy Olympiad Selection Camp** 2018

## INTERNSHIPS

### Image Functionality in Whiteboard Android Application

Summer 2021

*Microsoft India (R&D) Pvt. Ltd. | Software Engineer Intern*

Noida, India

- Integrated **Microsoft Lens SDK** into Whiteboard Android, to support image and OCR tools provided by Lens
- Worked in **Java Android** backend, building the bridge to send images from native Android to the web application
- Developed code in **React** for the web application, making the UI component for triggering image workflow

### Attribute Value Extraction from Product Descriptions

Summer 2020

*Coupa Software India Pvt. Ltd. | Data Science Intern*

Pune, India

- Developed unsupervised and semi-supervised methods for extracting attribute values from product descriptions
- Implemented an **RNN** model for sequence tagging using **CRF**, **BiLSTM** and **attention mechanisms**
- Automated taxonomy creation by clustering on co-occurrence graphs using the **Chinese Whispers Algorithm**

### Business Monitoring and Alerting Systems

Summer 2019

*Delta Exchange | Software Engineer Intern*

Mumbai, India

- Developed a dashboard in **Django** framework to monitor business performance, now being used on a daily basis
- Used **MySQL** database along with **APIs** and **WebSockets** of various exchanges for obtaining real time data

## KEY TECHNICAL PROJECTS

### VarScene: A Deep Generative Model for Realistic Scene Graph Synthesis

Autumn 2021

*Guides: Prof. Soumen Chakrabarti, Prof. Abir De | R&D Project*

IIT Bombay

- Lead contributor of paper submitted at **CVPR 2022**, done in collaboration with **Adobe Research**
- Developed a deep generative model for novel scene graph synthesis using **VAE** and **Graph Neural Networks**
- Designed a goal oriented decoder for minimizing the maximum mean discrepancy between graph distributions
- Significantly outperformed baselines on the Fréchet Inception Distances (**FID**) and Inception Scores (**IS**)

### Blockchain Simulation and Applications

Autumn 2021

*Guide: Prof. Vinay Ribeiro | Blockchains, Cryptocurrencies and Smart Contracts*

Course Project

- Implemented a peer-to-peer cryptocurrency network simulation in **C++** following the **Bitcoin** protocols
- Simulated selfish and stubborn mining attacks, analyzing the effects of hash power and network connectivity
- Developed a decentralized payment application on top of **Ethereum** in Solidity, utilizing smart contracts

### Deep Learning for Image Quality Enhancement

Spring 2021

*Guide: Prof. Suyash Awate | R&D Project*

IIT Bombay

- Enhanced the quality of frequency domain under-sampled and noisy MRI images with deep learning techniques
- Trained models with the **UNet** architecture in **PyTorch**, employing the standard and Noise2Noise paradigms
- Utilized intermediate **VGG-16** layers for style based losses and Fourier and Wavelet transform loss functions

### Route Optimization Algorithm

Winter 2019

*8<sup>th</sup> Inter IIT Technical Meet*

IIT Roorkee

- Proposed solution for the Vehicle Scheduling Problem in the setting of buses, winning **gold** medal among **20 teams**
- Reduced the problem to multiple instances of the Travelling Salesman Problem(**TSP**) using  $k$ -means clustering

## TECHNICAL SKILLS

Java, Python, C/C++, Git, JavaScript, Android, SQL, TensorFlow, PyTorch, Node.js, Django, Bash,  $\text{\LaTeX}$

## LEADERSHIP POSITIONS

### Institute Student Mentor | IIT Bombay

Jun 2021 - Present

- Mentoring **12 freshmen**, helping in adjusting to the institute environment and focusing on holistic development

### Senior Department Academic Mentor | IIT Bombay

Jun 2020 - Present

- Mentoring **6 sophomores** of CSE department to assist them in navigating department specific curriculum

## EXTRACURRICULAR

- Represented IIT Bombay at the **34<sup>th</sup> Inter IIT Aquatics Meet, IIT Guwahati** 2018
- Covered a distance of **23.2 km** swimming continuously for **12 hours** at Swimathon, IIT Bombay 2019