Tathagat Verma

Fourth Year Computer Science Undergraduate, IIT Bombay

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EDUCATION

Indian Institute of Technology Bombay, Mumbai, India *July 2018 - July 2022(expected)*
BTech. in *Computer Science and Engineering* with *Honors* CPI - **9.65/10**

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*
8th 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, 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 **34th Inter IIT Aquatics Meet, IIT Guwahati** *2018*
- Covered a distance of **23.2 km** swimming continuously for **12 hours** at Swimathon, IIT Bombay *2019*