Vatsal Gupta

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IMPORTANT LINKS   Website, Google Scholar, GitHub, LinkedIn, Publons

EDUCATION

Jaypee Institute of Information Technology; Noida, India   2017-2021
B. Tech. with Honors, Information Technology   GPA: 9.5/10

Mayo International School; New Delhi, India   2015-2017
Senior Secondary Education (CBSE)   94.25%

Indirapuram Public School; Ghaziabad, India   2013-2015
Secondary Education (CBSE)   GPA: 9.6/10

RESEARCH EXPERIENCE

IoT Lab, BITS Pilani
Lead Student Member   Aug 2020 - May 2021
- Performed extensive research in the field of Blockchain Applications and IoT
- Gained international exposure by collaborating with world-renowned scholars and presenting papers in reputed conferences like ACM Mobihoc and IEEE IWCMC
- Attained valuable mentorship experience by supervising new interns in the lab

Summer Research Intern   Mar 2020 - Aug 2021
- Worked under the mentorship of Dr. Vinay Chamola
- Engaged in several interdisciplinary research projects
- Proposed an incentivized crowdsourcing model for traffic jam prediction, which is featured in the paper - Traffic Jam Probability Estimation Based on Blockchain and Deep Neural Networks

Department of Computer Science & IT, JIIT Noida
Undergraduate Researcher   Oct 2019 - May 2021
- Assisted Dr. Vikas Hassija in his research projects
- Studied various types of Distributed Ledger Technologies (DLT) such as Blockchain, Hashgraph, and Directed Acyclic Graph
- Took part in a thorough study of supply chain's security-critical application areas and the ways in which emerging technologies could circumvent their security vulnerabilities

PROFESSIONAL EXPERIENCE

Dfyn Network
DeFi Analyst   Jun 2021 - Present
- Prepared technical reports & product explainers on various DeFi protocols
- Developed and deployed various Node.js modules to monitor and analyse on-chain data to identify attractive opportunities for capturing new users

Router Protocol
Research Analyst   Jun 2021 - Present
- Conducted extensive research in the domain of blockchain interoperability
- Wrote and edited technical and non-technical documents, including but not limited to the product whitepaper, grant proposals, and pitch deck

- Presented Router's vision for a modular cross-chain protocol in the form of a research proposal and secured grants from top tier blockchain foundations - a $140K grant from the Algorand Foundation and a $50K grant from Terra

Research & Development Intern   Apr 2021 - May 2021
- Performed technical due diligence to analyze dynamics/tradeoffs between different blockchain protocols
- Worked with the development team to code various strategies for on-chain governance

Medsupervision

Co-founder & CTO   Jul 2020 - May 2021
- Health-tech startup focused on connecting patients with healthcare providers through online appointments, check-ups, and consultations.
- Shelved this project as acquiring distribution became exponentially hard as we iterated over initial customer feedback.

ACADEMIC PROJECTS

Blockchain-based Electronic Medical Records (EMR) Management with OCR Assisted Summarization (Link) - A decentralized application built with ReactJS, Flask, Solidity, and IPFS, that allows users to store and retrieve their medical records securely. The application has built-in OCR capabilities that enable users and their trusted doctors to analyze the uploaded reports by extracting critical medical terms, including disease names and prescribed drugs.

Privacy-preserving Federated Learning Model For Email Spam Detection (Link) - This project employs federated learning to classify emails as spam or not spam while ensuring user privacy. Initially, various machine learning and deep learning models were trained on a publicly available dataset, and the models with the best results (SVM & GRU) were applied in a federated environment. Later, the homomorphic encryption technique was added to offer a higher level of data confidentiality.

Bi-LSTM-based Query Resolver (Link) - This project enables user to get answers to their medical queries. The Bi-LSTM model is trained using some frequently asked questions and answers. The question with the closest semantic relationship to the newly entered query is considered to be the one having the minimum pairwise Euclidean distance between their sentence embeddings.

Data Mining For Spatio-Temporal Rules With Geospatial Analysis of Crime Patterns (Link) - This project establishes a framework based on clustering and association rule mining to detect and analyze trends from temporal and spatial crime activity data. In this model, an open-source GIS application, QGIS, has been used to reveal crime hotspots, and a time series analysis has also been performed to analyze the changing patterns of crime with time.

AI-powered Real-Time Social Distance Monitoring System with Immutable Data Storage (Link) - A robust model that uses advanced deep learning techniques (YOLO v2) to monitor social-distancing violations at any given place in real time. The model also uses a blockchain-based data integrity validation tool to remove the risk of data tampering.

POSITIONS OF RESPONSIBILITY

Invited reviewer, IEEE Transactions on Intelligent Transportation Systems
Member of the Student Council, Jaypee Institute of Information Technology
Member of the Organizing Team, ETTIC 2020

PUBLICATIONS	V. Hassija, V. Gupta, S. Garg, V. Chamola, **"Traffic Jam Probability Estimation Based on Blockchain and Deep Neural Networks."** IEEE Transactions on Intelligent Transportation Systems. **Impact Factor: 6.492**
	V. Chamola, V. Hassija, V. Gupta, M. Guizani, **"A Comprehensive Review of the COVID-19 Pandemic and the Role of IoT, Drones, AI, Blockchain, and 5G in Managing its Impact."** IEEE Access. **Impact Factor: 3.367**
	V. Hassija, V. Gupta, V. Chamola, S. Kanhere, **"A Blockchain-based Framework for Energy Trading between Solar Powered Base Stations and Grid."** In BlockNet, ACM Mobihoc 2020.
	V. Hassija, V. Chamola, V. Gupta, S. Jain, N. Guizani, **"A Survey on Supply Chain Security: Application Areas, Security Threats, and Solution Architectures."** IEEE Internet of Things Journal. **Impact Factor: 9.471**
	V. Hassija, V. Chamola, V. Gupta, G.S.S. Chalapathi, **"A Framework for Secure Vehicular Network using Advanced Blockchain."** In 2020 International Wireless Communications and Mobile Computing (IEEE IWCMC).
	V. Hassija, V. Chamola, V. Gupta, G.S.S. Chalapathi, **"A Blockchain-based Framework for Secure Data Offloading in Tactile Internet Environment."** In 2020 International Wireless Communications and Mobile Computing (IEEE IWCMC).

CONFERENCES & WORKSHOPS	• **Future Blockchain Summit.** Dubai World Trade Centre, October 2021. • **World Blockchain Summit.** JW Marriott Marquis (Dubai), October 2021. • **Financial Cryptography and Data Security**, March 2021. • **ACM Mobihoc: International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing.** October 2020. • **16th Annual International Conference on Wireless Communications & Mobile Computing (IWCMC).** June 2020. • **MHRD Innovation Cell's India First Leadership Talk.** May 2020. • **Embracing the Transformative Times - An International Conference on Digitalization of Management and Social Sciences (ETTIC).** JIIT Noida, February 2020. • **IPR and Patenting in India.** JIIT Noida, November 2019.

HONORS AND AWARDS	• Secured PIEDS funding for startup • Top 5 in Execute 19.2 • Outstanding Student Award from Mayo International School

SKILLS	**Programming:** Python, C/C++, JavaScript, Solidity, SQL, HTML5/CSS, LaTeX **Javascript Libraries and Frameworks:** Node.js, React JS, ES6+ **Tools & Technologies:** Adobe Illustrator, Git, QGIS, Apache Spark

LANGUAGES	**Hindi** - Native proficiency **English** - Bilingual proficiency **German** - Elementary proficiency

TEST SCORES	**GRE:** 332/340 (Quants: 167, Verbal: 165) **TOEFL:** 116/120 (Reading: 30, Listening: 30, Speaking: 27, Writing: 29)

Certifications	**Neural Networks and Deep Learning** DeepLearning.AI	Mar 2021
	Blockchain Essentials Cognitive Class	Mar 2021
	Front-End Web Development with React The Hong Kong University of Science and Technology (Coursera)	Jul 2020
	Ethereum Blockchain Fundamentals Blockchain at Berkeley (edX)	May 2020
	Artificial Intelligence and Machine Learning IIT Delhi	Oct 2019
	Algorithms and Data Structures GeeksforGeeks	Aug 2018

Extracurricular Activities

Community Volunteer, **Light De Literacy**
Student Volunteer, **Rotary Noida Blood Bank**
Managing Team, **μCR - Microcontroller-based Systems and Robotics Hub**
Debate Showcase and Top 10 Debaters, **World Scholar's Cup**