Gaurang BANSAL

Director, Vedastu App. Pvt. Ltd. | Co-Founder, QuickAds | Google PhD Fellow | PhD @ NUS

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💼 PROFESSIONAL SUMMARY

Gaurang Bansal (PhD, NUS) is a distinguished researcher and recipient of the Google PhD Fellowship and NUS President Fellowship. With over 35 publications and more than 1000+ citations, he has extensive research experience spanning over 8+ years in python, deep learning, cybersecurity, and Large Language Models (LLMs). He is Director, Vedastu Applications Pvt. Ltd. and co-founder of QuickAds, an innovative AI-powered platform revolutionizing ad creation by making it effortless for businesses to generate, analyze, and publish high-quality ads.

🎓 EDUCATION

August 2020 Present	**Doctor of Philosophy, (PRIVACY & SECURITY), National University of Singapore** › **Thesis:** Advanced Security Protocols for lightweight IoT Device Communications. › **Advisor:** Prof. Biplab Sikdar, (HoD & Professor, NUS) Cybersecurity ⃝ Networking ⃝ Artificial Intelligence ⃝ Cryptography ⃝ Algorithm Design and Analysis ⃝ Machine Learning.
August 2018 June 2020	**M. Tech, (COMPUTER SCIENCE), BITS Pilani** › **Thesis:** On-Chip Security Solutions for Enhanced Lightweight IoT Protocols. › **Advisor:** Prof. Vinay Chamola (Associate Professor, BITS Pilani) Hardware Security ⃝ Optimisation ⃝ Cryptography ⃝ Network Security ⃝ Internet of Things. Algorithm Design
August 2014 June 2018	**B. Tech, (COMPUTER SCIENCE), BITS Pilani** › **Thesis:** 3D V-Net Segmentation Based Enhanced Lung Cancer Detection. › **Advisor:** Prof. Sundaresan Raman (Assistant Professor, BITS Pilani) Image Processing ⃝ Computer Vision ⃝ Machine Learning ⃝ Deep Learning ⃝ Data Augmentation ⃝ Pattern Recognition.

💼 EXPERIENCE

Jan 2024 Present	**Co-Founder, QUICKADS, Brandbooster, US** › **Title:** Quickads: AI-Ad Generator that creates effortless ads for all your campaigns. › **Co-Founder** Nitin Mahajan, Gourav Sharma › **Contribution:** QuickAds is an innovative AI-powered platform designed to streamline the entire ad creation process, making it effortless for businesses of all sizes to generate, analyze, and publish high-quality ads. It offers a comprehensive suite of tools that cater to various ad formats, languages, and styles, ensuring marketing campaigns are both effective and efficient. SQL Databases ⃝ FastAPI ⃝ Amazon AWS ⃝ React ⃝ Open AI APIs
August 2023 April 2024	**Research Collaborator, GOOGLE, Singapore** › **Title:** PhishNet: PhishDynamics: Real-time Chrome based browser plugin for Unsupervised Phishing Identification Using LLMs. › **Collaborators:** Sai Teja Peddinti, (Google) and Dinil Mon Divakaran, (Professor, NUS) › **Contribution:** The project offers real-time Chrome browser plugin for phishing detection, employing unsupervised learning and large language models (LLMs). This innovative approach not only ensures enhanced detection accuracy and user privacy but also stands out with its performance, achieving an impressive 99.6% accuracy rate. This surpasses established systems like Phishpedia, Open Phish, and Virus Total. Its strengths lie in its immediate URL verification, in-depth server-side processing using image transformers, autoencoders, and classifiers, and the ability to learn and adapt continuously, thus reducing reliance on extensive manual training datasets and external cloud services. Cybersecurity ⃝ Machine Learning ⃝ Large Language Models ⃝ Selenium ⃝ Browser Plugin

January 2019 Present	**Senior Researcher, BITS Pilani & NUS, ASEAN** › **Title:** Securing Resource-Constrained Networks using Advanced Cryptographic Approach › **Collaborators:** Biplab Sikdar, (Professor, NUS), Dusit Niyato, (Professor, NTU), F. Richard Yu (Professor, Carleton University), Nirwan Ansari (Professor, NJIT) and Vinay Chamola (Assoc. Professor, BITS Pilani) › **Contributions:** Designing advanced software-based authentication methods using rapid cryptography. Addressing attack scenarios in resource-limited systems, understanding threats from adversaries and showcasing formal security assessments coupled with mathematical analysis. `Cryptographic protocols` `attack mitigation` `adversarial threat analysis` `security formal methods.`
May 2022 Jan 2023	**Tech Lead Researcher, Drife, Bangalore** › **Title:** Achala: Pioneering Decentralized Mobility with Blockchain-Integrated Geospatial Systems › **Collaborators:** Mudit Marda, (CTO, DRIFE) and Vikas Hassija (Associate Professor, KIIT) › **Contribution:** Architected a specialized distributed ledger system for integrating mobility primitives with blockchain. Engineered a decentralized ride-sharing platform akin to Uber, enabling dApps deployment for advanced mobility solutions, fostering a peer-to-peer transportation network. Innovated a decentralized geospatial system, facilitating real-time indexing, geo-querying of roaming entities, and intricate geo-fence operations in a fully distributed framework. `Distributed ledger systems` `Python` `Real-time data indexing` `Geo-querying and geo-fencing`

📖 PUBLICATIONS

J = Journal | C = Conference

[J23] G. Bansal and B. Sikdar, "Peer2Peer Mutual Authentication-Attestation Protocol in UAV Swarms," IEEE Internet of Things Journal, 2024 (IF: 10).

[J22] A. Madan, G. Bansal, V. Chamola, and D. Tipper, "Enhancing Infectious Disease Outbreak Surveillance via Bidirectional Contact Tracing," IEEE Sensors Journal, 2024 (IF: 4.3).

[J21] G. Bansal, "An Optimal Pricing Based Spectrum Allocation Model in Broadband Market," IEEE Transactions on Cyber Physical Systems, 2023.

[J20] G. Bansal, M. Baser, and V. Chamola, "Three-Tier Indirect Tracing Model for Enhancing Epidemic Surveillance," IEEE Internet of Things Magazine, 2023.

[J19] G. Bansal, V. Chamola, M. Guizani, and D. Niyato, "Transforming Conversations with AI - A Comprehensive Study of ChatGPT," Cognitive Computation, 2023 (IF: 5.4).

[J18] G. Bansal, V. Chamola, A. Jolfaei, and S. Mumtaz, "Cracking the Dark Web: Attacks in Tor Network," IEEE Internet of Things Magazine, 2023.

[J17] G. Bansal, A. Nawal, V. Chamola, and N. Herencsar, "Prose to Pixels: Generative AI's Impact on Consumer Electronics Imaging," IEEE Transactions on Consumer Electronics, 2023 (IF: 4.3).

[J16] G. Bansal, K. Rajagopal, V. Chamola, Z. Xiong, and D. Niyato, "Healthcare in Metaverse: A Survey on Current Metaverse Applications in Healthcare," IEEE Access, 2023 (IF: 3.6).

[J15] G. Bansal and B. Sikdar, "Achieving Secure and Reliable UAV Authentication: A Shamir's Secret Sharing Based Approach," IEEE Transactions on Network Science and Engineering, 2023 (IF: 6.6).

[J14] G. Bansal, A. Tyagi, and V. Chamola, "PUF Based Fault Tolerant Authentication Protocol for Vehicle to Smart Grid Communications," Vehicular Communications, 2023 (IF: 8.8).

[J13] V. Chamola, G. Bansal, T. Kumar, V. Hassija, N. S. S. Reddy, J. Wang, S. Zeadally, A. Hussain, F. R. Yu, M. Guizani, and D. Niyato, "Beyond Reality: The Pivotal Role of Generative AI in the Metaverse," IEEE Internet of Things Magazine, 2023.

[J12] G. Bansal, V. Chamola, B. Sikdar, and N. Ansari, "Scalable Topologies for Time-Optimal Authentication of UAV Swarms," IEEE Network Magazine, 2022 (IF: 10.3).

[J11] G. Bansal, N. Naren, V. Chamola, and B. Sikdar, "SHOTS: Scalable Secure Hardware Based Authentication-Attestation Protocol Using Optimal Trajectory in UAV Swarms," IEEE Transactions on Vehicular Technology, 2022 (IF: 6.8).

[J10] G. Bansal and B. Sikdar, "Beyond Traditional Message Authentication Codes: Future Solutions for Efficient Authentication of Message Streams in IoT Networks," IEEE Internet of Things Magazine, 2022.

[C11] G. Bansal and B. Sikdar, "Fault Resilient Authentication Architecture for Drone Networks," IEEE ICC Workshop, 2022.

[C10] G. Bansal and B. Sikdar, "Secure and Trusted Attestation Protocol for UAV Fleets," IEEE INFOCOM Workshop, 2022.

[J9] T. Alladi, N. Naren, G. Bansal, V. Chamola, and M. Guizani, "SecAuthUAV: A Novel Authentication Scheme for UAV-Ground Station and UAV-UAV Communication," IEEE Transactions on Vehicular Technology, 2021 (IF: 6.8).

[J8] G. Bansal, V. Chamola, G. Kaddoum, M. J. Piran, and M. Alrashoud, "Next Generation Stock Exchange: Recurrent Neural Learning Model for Distributed Ledger Transactions," Computer Networks, 2021 (IF: 5.5).

[J7] G. Bansal, V. Chamola, B. Sikdar, and F. R. Yu, "UAV SECaaS: Game-Theoretic Formulation for Security as a service in UAV Swarms," IEEE Systems Journal, 2021 (IF: 4.8).

[C9] G. Bansal and B. Sikdar, "A Secure and Efficient Mutual Authentication Protocol Framework for Unmanned Aerial Vehicles," Globecom Workshop, 2021.

[J6] G. Bansal and B. Sikdar, "Location Aware Clustering: Scalable Authentication Protocol for UAV Swarms," IEEE Networking Letters, 2021.

[J5] G. Bansal and B. Sikdar, "S-MAPS: Scalable Mutual Authentication Protocol for Dynamic UAV Swarms," IEEE Transactions on Vehicular Technology, 2021 (IF: 6.8).

[C8] G. Bansal and B. Sikdar, "Security Service Pricing Model for UAV Swarms: A Stackelberg Game Approach," DroneCom, INFOCOM Workshop, 2021.

[C7] G. Bansal, A. Tyagi, V. Narayanan, and V. Chamola, "Hardware Testbed based Analytical Performance Modelling for Mobile Task Offloading in UAV Edge Cloudlets," VTC Workshop, 2021.

[C6] G. Bansal and A. Bhatia, "A Fast, Secure and Distributed Consensus Mechanism for Energy Trading Among Vehicles Using Hashgraph," Proceedings of IEEE International Conference on Information Networking (ICOIN), Barcelona, Spain, 2020.

[C5] G. Bansal and V. Chamola, "Lightweight Authentication Protocol for Inter Base Station Communication in Heterogeneous Networks," BlockSecSDN, INFOCOM Workshop, 2020.

[J4] G. Bansal, V. Chamola, P. Narang, S. Kumar, and S. Raman, "Deep3DSCan: Deep Residual Network And Morphological Descriptor Based Framework for Lung Cancer Classification And 3D Segmentation," IET Image Processing Journal, 2020 (IF: 2.7).

[C4] G. Bansal, N. Naren, and V. Chamola, "RAMA: Real-Time Automobile Mutual Authentication Protocol Using PUF," Proceedings of IEEE International Conference on Information Networking (ICOIN), Barcelona, Spain, 2020.

[J3] G. Bansal, N. Naren, V. Chamola, B. Sikdar, N. Kumar, and M. Guizani, "Lightweight Mutual Authentication Protocol for V2G Using PUF," IEEE Transactions on Vehicular Technology, 2020 (IF: 6.8).

[J2] V. Hassija, G. Bansal, V. Chamola, N. Kumar, and M. Guizani, "Secure Lending: Blockchain and Prospect Theory-Based Decentralized Credit Scoring Model," IEEE Transactions on Network Science and Engineering, 2020 (IF: 6.6).

[C3] S. Kumar, G. Bansal, and V. Shekhawat, "A Machine Learning Approach for Traffic Flow Provisioning in Software Defined Networks," Proceedings of IEEE International Conference on Information Networking (ICOIN), Barcelona, Spain, 2020.

[C2] G. Bansal, A. Dua, G. S. Ajula, M. Singh, and N. Kumar, "SmartChain: A Smart and Scalable Blockchain Consortium for Smart Grid Systems," IEEE International Conference on Communications, Shanghai, China, 2019.

[J1] G. Bansal, V. Hassija, V. Chamola, N. Kumar, and M. Guizani, "Smart Stock Exchange Market: A Secure Predictive Decentralised Model," Proceedings of the 2019 IEEE Globecom, Big Island, HI, USA, 2019.

[C1] V. Hassija, G. Bansal, V. Chamola, V. Saxena, and B. Sikdar, "Blockcom: A blockchain based commerce model for smart communities using auction mechanism," IEEE International Conference on Communications, Shanghai, China, 2019.

☰ SKILLS

Programming	Python (FastAPI), C/C++, HTML5.
Libraries	Tesorflow, PyTorch, Scikit-Learn, Matplotlib, Plotly
Frameworks	Google Gemini, OpenAI ChatGPT, Kaggle, FastAPI
APIs	OpenAI APIs, Hugging Face, GitHub
Cloud Services	Amazon AWS
Version Control	Git, BitBucket
Database	PostgreSQL
Office automation	LaTeX, Pack Office(Word, Excel, PowerPoint), Power Bi.

💻 COORDINATOR

Co-Chair	› IEEE PERCOM 2022 Workshop
	› IEEE INFOCOM 2022 Workshop
	› IEEE GLOBECOM 2021 Workshop

TPC	> IEEE ICC
	> IEEE WiMob
	> IEEE INFOCOM

🎓 TEACHING

Courses	> Artificial Intelligence
	> Computer Networks
	> Network Security
	> Cryptography
	> Machine Learning

🎓 AWARDS, GRANTS AND FELLOWSHIPS

2022	Google PhD Fellowship (USD $ 20,000)
2022	Co-Principal Investigator, ASEAN-India Grant, DST, India (USD $ 43,000)
2021	Student Grant, Internet Engineering Task Force (IETF) (USD $ 1800)
2021	Keynote Speaker, University of Cape Town
2020	NUS President Graduate Fellowship (USD $ 95,000)
2018	Prototype Development, APOGEE, BITS Pilani (WINNERS)
2014	Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship
2013	National Mathematical Olympiad (Rank: 1)

66 REFEREES

Prof. Vinay Chamola	**Prof. Biplab Sikdar**	**Sai Teja Peddinti**
Associate Professor	*Professor & Head of Department*	*Staff Research Scientist*
BITS PILANI	NATIONAL UNIVERSITY OF SINGAPORE	GOOGLE
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