Divye Kalra

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EDUCATION

Johns Hopkins University — Baltimore, USA
Master of Science in Security Informatics — *Aug 2024 - Expected Dec 2025*
- Coursework: Software Vulnerability Analysis, Security and Privacy in Computing, Cloud Computing Security, Cybersecurity Risk Management, Network Security, Ethical Hacking, Cryptography

BITS Pilani — Hyderabad, India
B.E. Electrical & Electronics and M.Sc. Mathematics — *Aug 2019 - Jun 2024*
- Coursework: Data Structures, Operating Systems, Graph Theory, Advanced Algebra, Probability and Statistics

EXPERIENCE

Johns Hopkins University & Applied Physics Laboratory (APL) — Jan 2025 - Present
Graduate Research Assistant — *Baltimore, USA*
- Project Title : Automotive Cybersecurity and Secure Vehicular Communication
  Supervisors : Prof. Yinzhi Cao, Dr. Anton Dahbura, Dr. Ahmed Abdo.
- Integrating C-V2X (Cellular Vehicle-to-Everything) communication technology into VESNOS, a vehicular security simulation platform, to enhance connected and automated driving capabilities.
- Exploring cybersecurity and assurance challenges in Connected and Automated Vehicles (CAVs) to improve secure vehicular communication.

Information Security | Research Assistant — Jan 2024 - June 2024
IITB Trust Lab, Indian Institute of Technology Bombay — *Mumbai, India*
- Project Title : Implementing a Cryptographic Agents Scheme for CASE
  Supervisor : Dr. Manoj Prabhakaran
- Implemented a COA-secure cryptographic primitive in Rust known as CASE (Completely Anonymous Signed Encryption).
- Collaborated with peers on the development of the ECAS (Existentially Consistent Anonymous Signatures).
- Facilitated the onboarding and handover process for an intern responsible for the ECAS development.
- Developed bare-bones functions to support ECAS development, enabling future use by other developers.

Hardware Security | Research Assistant — July 2023 - Dec 2023
Cyber Security Hub, Macquarie University — *Sydney, Australia*
- Project Title : Provable hardware-embedded security and privacy
  Supervisor : Dr. Dali Kaafar
- Designed and implemented a framework for deploying a network of Trusted Execution Environments (TEEs).
- Ensured secure aggregation and computation on data from multiple sources using C, C++, and Python.
- Employed bloom filters and advanced encoding techniques for secure data handling.

Software Development — Oct 2022 - Dec 2022
BITS Pilani — *Hyderabad, India*
- Project Title : Full Stack Web Development - CartIn Online Supermarket
- Developed a digital marketplace facilitating seamless buying and selling for 4000+ college students.
- Implemented key features: Add to Cart, Payment, Search and CRUD functionalities with distinct authentication for users, vendors, and admins.
- Front-end: HTML, Tailwind CSS, VueJS
- Back-end: Java SpringBoot, PostgreSQL, JDBC.

PUBLICATIONS AND PATENTS

First Inventor | A Device and Method for a Lightweight Stream Cipher — June 2020 – Present
Indian Patent Published in the *Official Journal of the Patent Office* | Issue Number 49/2023

Co-author | Efficient and lightweight data encryption scheme for embedded systems
Published in *e-Prime - Advances in Electrical Engineering, Electronics and Energy* | https://doi.org/10.1016/j.prime.2023.100273

Co-author | *Machine Learning based prediction of Vanadium Redox Flow Battery temperature rise*
Published in *Energy Storage* | https://doi.org/10.1002/est2.70087

SKILLS

Languages: C, C++, Python, Java, Rust, SQL, MATLAB, HTML/CSS
Frameworks/Libraries: FastAPI, Django, SpringBoot, p5.js, Matplotlib
Softwares/Tools/Skills: Git, Docker, DigitalOcean, Kubernetes, Google Cloud Platform (GCP), Jekyll, Powerpoint, Excel, LaTeX, MySQL, Network Analysis, Bash scripting, Source Code Analysis, Threat Modeling, Reverse Engineering, Version Control, Cybersecurity Compliance
Operating Systems: Windows, Unix (macOS, Ubuntu, Kali Linux, KDE Neon)