Charan Annadurai

Offenburg | charan.442000@gmail.com | +49 1704345787, +91 9360164553

charan-coding.github.io/portfolio/ | linkedin.com/in/charan-annadurai-56652a1b7/

github.com/charan-coding

Summary

Results-driven Security Engineer and Blockchain Developer with a passion for problem-solving and a knack for analytical thinking. Possesses foundational knowledge in cybersecurity principles and blockchain development, including proficiency in coding languages like Python and Javascript. Committed to leveraging skills to enhance system security and optimize backend processes.

Skills and Expertise

- Research and analysis
- Literature reviews
- Blockchain integration
- Blockchain architecture
- Industry-specific blockchain applications
- Fraud Detection
- Cybersecurity practices
- Cybersecurity principles
- Compliance
- EU Law
- Secure Software Development
- Information Security
- Cloud computing
- Data Analysis
- Risk Management
- Mobile Security
- Hardware Security
- Electronics

Education

Hochschule Offenburg, Offenburg University of Applied Sciences, MS in Enterprise and IT Secuirty — Sept 2022 – March 2024

- GPA: **1.33** (91.75%)
- **Fee Waiver:** 1500 EUR per semester based on Academic Performance (Exemption for international students with exceptional aptitude)
- **Relevant Coursework:** Applied Cryptanalysis, Data Mining & Risk Analysis, EU IT Law
- **Unique Contributions:**
  - **Anonymity and Surveillance Seminar:** Wrote a scientific paper on the Panopticon.
  - **Mobile Security Lab:** Developed a triangulation algorithm using SSIs and Tower Co-ordinates.
  - **Software Security Lab:** Developed a Secure Password Management System using Python and Fast API.
  - **IT Security Lab:** Created an Intelligent Threat Prevention System for API calls with a PowerBI Dashboard, rule-based, and signature-based threat detection.
  - **Security in Ubiquitous Computing:** Literature Survey on "Using hardware-based trust enablers to secure the machine learning lifecycle" and "Covert Side Channel Analysis".

Amrita Vishwa Vidhyapeetham, Coimbatore, B.Tech in Electronics and Communication Technology — June 2018 – May 2022

- GPA: **2.10** [CGPA of **7.81/10**]
- **Relevant Coursework:** Hardware Security and Trust, Pattern Recognition and Algorithms, Network Theory and Computer System Architecture.

- **Unique Contributions:**
  - **Open Lab:** Used OpenCV's pre-trained Model to create a Facial Gesture replacement for mouse inputs.
  - **Microcontroller Lab:** Designed a voting application on an 8085 Microprocessor (Simulated).

Experience

Research Associate, Institute of Reliable Embedded Systems and Communication Electronics (ivESK) – Offenburg, Germany　　　　　　May 2024 – Current

- Developed blockchain-based trust systems using Hyperledger Fabric for **Health Data Sharing Agreements** and for **Agriculture Supply Chain Traceability**.
- Assisted in the development of new research proposals, resulting in increased funding opportunities and project growth.
- Converted a mobile Go backend into a Hyperledger Fabric-based blockchain backend.
- Designed a decentralized authentication framework leveraging **Decentralized Identifiers (DIDs)** and **Verifiable Credentials (VC)** to enable privacy-preserving authentication in Multi-Agent Systems (MAS).
- Key Words: Smart Contracts, Data Sharing, Privacy, Trust, Hyperledger Fabric, Docker, UML, JavaScript, Node.js. Solidity, AVISPA, Tamaren.

Research Assistant, Institute of Reliable Embedded Systems and Communication Electronics (ivESK) – Offenburg, Germany　　　　　　Oct 2023 – Mar 2024

- Analyzed an existing mobile back-end, created comprehensive **documentation**, and designed initial UML and state diagrams to transition it into a blockchain-based system.
- Worked directly with both **development and customer teams**, ensuring a smooth transition from concept to implementation.
- Keywords: UML, System Analysis, Documentation. Javascript, APIs, JSON, Hyperledger Fabric, Docker

AWS Cloud Intern, F13 Tech Delhi, IN　　　　　　Nov 2021 – Jan 2022

- Drafted a requirements document for the purpose of acquiring a tender contract and curated a set of recommended services for **Indian Railway Catering and Tourism Corporation (IRCTC)**.
- Acquired multiple AWS Partner certificates as part of the training process.
- Key words: AWS, Cloud Computing, Instances, EC, EBS, APN

Publications

Distributed Authentication using Self Sovereign Identities PDF　　　　　　Nov 2024

Charan Annadurai, Axel Sikora, Dominik Welte

10.1109/ICETI63946.2024.10777147

Projects

Incentivizing Scientific Research Using a Reputation Scaled Proof of Stake Blockchain　　　　　　Github

- Designed and implemented a **custom blockchain** from scratch in Python.
- Developed a **scaled Proof-of-Stake model** for a decentralized social media platform focused on incentivizing scientific discourse.
- Tools Used: Python, FastAPI

HyperAccess - Blockchain-Based Data Sharing for Healthcare　　　　　　Github

- Developed a blockchain-based trust system using **Hyperledger Fabric** to expedite **data-sharing agreements** between hospitals, research centers, and ethical boards.
- Replaced physical document signing with a decentralized and verifiable blockchain solution.
- Modified base hyperledger fabric to include **infinite organisations**.
- Tools Used: Hyperledger Fabric, JavaScript, Node.js, Smart Contracts

Agricultural Supply Chain Traceability   Github

- Developed a blockchain-based traceability system to ensure transparency and authenticity in **agricultural supply chains**.
- Converted a **mobile backend** into a Hyperledger Fabric-based blockchain solution for **real-time tracking** of agricultural produce.
- Tools Used: Hyperledger Fabric, JavaScript, Node.js, REST APIs

Intelligent Threat Prevention System (ITPS)   Github

- Developed an AI-powered Intrusion Prevention System (IPS) to detect real-time threats using a hybrid approach of **Anomaly-Based and Signature-Based detection.**
- Successfully detects attacks such as **SQL Injection (SQLi),** Cross-Site Scripting (XSS), and Cross-Site Request Forgery (CSRF).
- Uses a combination of Machine Learning (CNN, Random Forest, SVM) and Rule-Based detection for enhanced accuracy.
- Real-time monitoring and alerting system with an interactive **dashboard for threat visualization.**
- Features a **low-code/no-code system** for security administrators to create custom visualizations without programming.
- Tools Used: Python, TensorFlow, Scikit-learn, FastAPI, PowerBI.

Scalable Machine Fault Diagnosis using Machine Learning   Github

- Trained a machine learning model to detect Short Circuit Faults in 5kW and 3kW motors based on electrical readings.
- Tools Used: Python, Scikit, Keras

Secure Password Management Using Python and FastAPI   Github

- Developed a Secure Password Management System to enhance credential security.
- Followed Secure Software Development Lifecycle (SDLC) best practices.
- Tools Used: Python, FastAPI, Security Practices

Achievements

- Placed 3rd in **CISCO's Thinkubator Ideation Bootcamp** - 2021
- Fee Waiver for Master's Business Consultant Training Path (Amazon Partner Network)
- **IELTS SCORE** - 8 Band (of 9)
- **Computer Vision** - Image Basics with OpenCV and Python (Coursera)
- **Introduction to Cybersecurity** - Cisco (Netacad)
- **Introduction to Cybersecurity for Business** - University of Colorado Systems (Coursera)

Technologies

Languages: Python, JavaScript, C++, SQL, Bash, Java

Others: Hyperledger Fabric SDK (Node.js, Python, Go), Web3.js, Scikit-learn, Matplotlib, PowerBI, AVISPA (for security verification), Docker, OpenCV, TensorFlow, Pandas, NumPy, Flask, FastAPI, Linux, Git