BALAJI RAJA

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EDUCATION

Master of Computer Science Graduating May 2024
Arizona State University, Tempe, AZ 3.83 CGPA (4 point scale)
Relevant coursework: AI, ML Security, Software Security, Distributed Database Systems

Bachelor of Engineering in Computer Science and Engineering Aug 2018 - May 2022
Madras Institute of Technology, Chennai, Tamil Nadu, India 8.34 CGPA (10 point scale)
Relevant coursework: Data structures & Algorithms, OS, ML, OOP, Deep Learning, Java

TECHNICAL SKILLS

Programming: C++, Python, JavaScript, Java, Swift, SQL, HTML5 , CSS3 , PHP
Framework/Libraries: Hyperledger Fabric, Node.js, Git, PyTorch, TensorFlow, Pandas, AVFoundation
Databases and OS: MongoDB, MySQL, PostgreSQL, NoSQL, Windows, MacOS, Linux, iOS
Certifications: AWS Certified Cloud Practitioner (https://rb.gy/s5y0r), Cisco Packet Tracer(https://rb.gy/kat1y)

EXPERIENCE / VOLUNTEER

NGN Lab, Anna University, Chennai, India: Research & Dev Student Intern Feb 2020 - March 2022

- Designed and developed a permissioned ledger (Hyperledger) based Secure Unmanned Traffic System (UTM)
- Integrated UTM system with Digi sky to get live location updates of drones (Node.js)
- Published a patent for UTM in The Patent Office Journal, India (https://shorturl.at/ehyT6)

ACADEMIC PROJECTS

Mobile Phone Supply Chain Management System Aug 2023 - Sep 2023

- Deployed a distributed database across 5 locations, boosting scalability by 200% and ensuring data availability.
- Leveraged fragmentation across 5 servers, enhancing data retrieval speeds by 60%.
- Employed replication to maintain 3 copies of data, reducing system recovery times by 75% after failures.

HSense: iOS Heart Rate Detection App July 2023 - Sep 2023

- Developed a heart rate app using Swift and AVFoundation by analyzing video footage of skin patches.
- Optimized performance across supported iPhone models.

Adverse attacks on LeNet CNN Model Aug 2022 - Sep 2022

- Achieved a 90.33% classification accuracy on the Fashion MNIST dataset using the LeNet CNN architecture.
- Successfully executed adversarial attacks: achieved an 86.12% success rate with the FGSM attack and a 100% success rate using the PGD attack.

Defending the Openpilot Model Against Adversarial Attacks Aug 2022 - Dec 2022

- Conducted a white box patch attack on the Openpilot model with an attack accuracy of 100%.
- Implemented Fourier Transform techniques to detect adversarial patterns during system interference.
- Discarded unfavorable samples, achieving a 99% accuracy rate in defense.

Xv6 Enhanced: GUI Integration for a Classic OS Aug 2021 - Nov 2021

- Integrated a text-based GUI into the XV6 kernel, adding functionalities like a desktop menu interface.
- Introduced multiple system calls, including shutdown, process table management, and date retrieval.

PUBLICATIONS

Hybrid-AI Blockchain Supported Protection Framework for Smart Grids Oct 2021 - Jan 2022

- Published at Computing Conference 2022, London, UK DOI:10.1007/978-3-031-10467-1_39

Predicting Osteosarcoma using eXtreme Gradient Boosting Model Dec 2021 - Feb 2022

- Published at the IEEE ACCAI-2022 DOI:10.1109/ACCAI53970.2022.9752602

Nexus of 6G and Blockchain for Authentication of Aerial and IoT Devices Jul 2021 - May 2022

- Published at the IEEE ICC, Seoul, South Korea DOI:10.1109/ICC45855.2022.9838856

MLB-IoD: Multi Layered Blockchain assisted 6G Internet of Drones Ecosystem Jan 2021 - Aug 2022

- Published at the IEEE Transactions on Vehicular Technology DOI:10.1109/TVT.2022.3213567

OTHER WORK EXPERIENCE

Arizona State University, Tempe, AZ: Transcriptionist (20 hours/week) Mar 2023 - Present

- Transcribed audio files and structured transcription files into Dropbox directories while ensuring 98% accuracy.