Indumathi Madhu

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linkedin.com/in/indumathi-madhu — Washington DC, US

Interests

System Engineering, Robotics, CPS

Education

The George Washington University, Washington, DC, USA — Aug 2024 – Present
PhD in Computer Science

Birla Institute of Technology & Science, Hyderabad, India — Jan 2020 – Jul 2022
M.Tech. in Software Systems (Cybersecurity); GPA: 8.02/10
Courses: Cybersecurity, Network Security, Cloud & IoT Security, Ethical Hacking

Bharathiar University, Coimbatore, India — May 2016 – May 2019
M.Sc. in Computer Science; GPA: 7.07/10
Courses: Computer Networks, Software Engineering

Hindusthan College of Arts and Science, Coimbatore, India — Jul 2013 – May 2016
Bachelor of Computer Applications; GPA: 7.89/10
Courses: Mathematical Structures for Computer Science, C, C++, Java Programming

Professional Experience

Birla Institute of Technology and Science — 2022 – 2024
Visiting Faculty

- Conceptualized and crafted laboratory experiments centered on In-Vehicle communication protocols, encompassing CAN, CAN-FD, LIN, and Ethernet. Activities included data monitoring, simulation, signal tracking, scripting, automation, PC-based data logging, and the utilization of diverse databases and file formats.
- Spearheaded the establishment of CAN Fuzzing test environments, encompassing scenario creation, outcomes analysis, and meticulous documentation of defects and glitches.
- Introduced BITLabs, an inventive Remote Desktop Control solution enabling remote access to physical lab setups from any location.
- Oversaw the configuration and visualization of LIDAR technology.
- Developed an experiment focusing on CAN bus exploitation, involving splicing into the CAN network, data capture using PCAN, and the application of reverse engineering techniques via PCAN View.
- Collaborated with Intrepid Control Systems on projects related to CAN, CAN-FD, LIN, and Ethernet protocols during industry immersion.
- Assisting students with their dissertation and practical school projects involving CAN Firewall Protection, Message Authentication Technology, Implementation of security techniques like digital watermarking in telematics control units of connected cars, FOTA in contemporary automobiles, and secure software downloads and cybersecurity measures for automotive Electronic Control Units (ECUs).

ReynLab by Sirius Motorsports — 2020 – 2022
Instructor (Deputed in BITS Pilani)

- Established an Automotive Cyber Systems laboratory from the ground up, tailored to the needs of working professionals in the Automotive and Manufacturing sectors, with a thoughtful approach to course materials.
- Collaborated with a team of 3 to develop setups on CAN exploitation on Instrumentation Cluster and Tapping CAN messages from steer-by-wire and head unit of a Skoda.

Scoop Technologies 2019 – 2020
Service Desk Associate (Deputed in Wipro Technologies)
- L2 Engineer - Efficiently handled support tickets through chat, ensuring compliance with service level agreements, and played a crucial role in ensuring the smooth operation of IT systems and infrastructure for end-users.

Aalan Technology 2018 – 2019
Software Trainee
- Designed, developed, and implemented software applications aimed at automating and streamlining business processes within the textile industry

Cognizant Technology Solutions 2016 – 2018
System Engineer
- L1 Engineer - Ensured the seamless availability and optimal functionality of IT systems and applications while consistently providing excellent customer service

Teaching & Mentoring Experience

Design of Autonomous Systems Lab, The George Washington University 2024 – 2025
- Teaching Assistant (2025): Python, Algorithms, Object Detection, ROS, Linux
- Teaching Assistant (2024): Systems Programming (C Programming)

Automotive Cyber Systems Lab, Birla Institute of Technology and Science 2020 – 2024
- Faculty: CAN, CAN-FD, LIN, Ethernet

Soft Skills and Placement Trainer, PSGR Krishnammal College of Arts and Science 2016 – 2022
- Mentor: Trained undergraduate students on soft skills, communication, aptitude, work-life balance, and resume preparation.

Selected Projects

- **Privacy-Preserving Services for Intelligent Transportation Systems with Homomorphic Encryption** – CO2 emission prediction through the implementation of Homomorphic Encryption.
- **AI-based Intrusion Detection Systems for Securing Automotive Network Protocols: A Systematic Literature Review.**

Certifications

- Cyber Security in Manufacturing, University of Buffalo (2022)
- Diploma in Computer basics and administration, INNIVERS (2018)

Skills Summary

Programming: Python, C, SQL
Frameworks: OpenCV

Tools: VehicleSpy, Vector, PCAN view
Platforms: Linux, Windows, Arduino, Raspberry Pi, Nvidia Jetson
Soft Skills: Critical thinking, R&D team leadership, Systematic thinking

Volunteer Experience

- Organizer, BITS AUTOwn'23, Birla Institute of Technology and Science
- Member, Divyang Warrior's, Birla Institute of Technology and Science

Extra Curricular Activities

- Athletics: Achieved a 16 - second sprint in the 100-meter dash.
- Leisure Pursuits: Encompasses swimming, gardening, dancing, culinary arts, and creative crafting

Honors

- Academic Scholarship, Birla Institute of Technology and Science.

References

Available upon request.