Kelli Yuvraj

Bhubaneswar, Odisha
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Education

Silicon University **Sep. 2023 – Present**
Bachelor of Technology in Computer Science *Bhubaneswar, Odisha*

St. Mary's English High School **Jamshedpur, Jharkhand**
Senior Secondary Education *Mar. 2008 – Mar. 2023*

Experience

Freelance Security Researcher **Oct. 2024 – Jan. 2025**
Silicon University *Bhubaneswar, Odisha*

- Identified and exploited a vulnerability in the college ERP system, allowing unauthorized access to any user account, including admin privileges.
- Detected multiple logic flaws within the ERP system and other internal platforms.
- Uncovered several coding errors related to insecure practices, impacting data security and user privacy.
- Leveraged Burp Suite for comprehensive vulnerability scanning, payload injections, and parameter manipulations to identify and exploit weaknesses.

Research & Development Intern **June 2024 – Aug 2024**
IG Drones *Bhubaneswar, Odisha*

- Developed a comprehensive indoor drone simulation using ROS, MAVROS, and Gazebo, demonstrating end-to-end autonomy for indoor navigation and tracking.
- Implemented SLAM (Simultaneous Localization and Mapping) with RTAB-Map to enable real-time mapping and localization, improving environmental perception over conventional methods.
- Designed and configured a custom exploration system using tailored explore.launch parameters, allowing the drone to autonomously navigate complex indoor spaces.
- Integrated a Dockerized ROS environment for consistent and reproducible testing across various hardware configurations, ensuring smooth deployment and collaboration.
- Optimized the system's performance by fine-tuning ROS nodes, leveraging RViz for visualization, and streamlining communication between the drone's control systems and simulation environment.
- Collaborated on a codebase managed with Git, emphasizing modularity and maintainability in the development process.
- Conducted extensive simulation trials in Gazebo, validating system reliability and establishing a robust framework for autonomous navigation without operator intervention

Projects

Eliminating Software-Defined Radio Dependency in Satellite Security Research **January 2025 – Present**

- Developed a software-only attack methodology to exploit vulnerabilities in satellite command authentication, eliminating the need for expensive SDR hardware.
- Successfully demonstrated command injection and replay attacks on an open-source satellite control framework (OpenSatKit - OSK).
- Analyzed the security implications of satellite ground station protocols, exposing potential threats in satellite telemetry and telecommand (TM/TC) systems.
- Conducted comparative analysis of traditional SDR-based attacks vs. software-only methods, highlighting a cost-efficient and scalable approach to satellite security research.
- Proposed mitigation strategies to enhance authentication mechanisms in satellite communication protocols.

Technical Skills

Languages: Python, Java, C, HTML/CSS, SQL
Technical Skills: Cybersecurity, Web Application Security, Linux, Networking, Bash Scripting, Python Scripting, Vulnerability Assessment and Penetration Testing, Satellite Security & SDR-Free Attacks, Embedded Systems, Drone Simulation, SLAM Navigation, Troubleshooting, Indoor Drone Simulation & Control
Tools: Burp Suite, Wireshark, Nessus, Nmap, Metasploit, John the Ripper, Nikto, Hydra, Netcat, SQLMap, Aircrack-ng, Autodesk Fusion 360, Gazebo, PX4-Autopilot, ROS, MAVROS,RTAB-Map, ArduinoIDE