Sudhir Gunaseelan

Email: sudhir.gunaseelan@gmail.com
Portfolio: sudhir848.github.io/My-Personal-Portfolio/
Mobile: +1 (978) 930-0366
GitHub: github.com/sudhir848
LinkedIn: linkedin.com/in/sudhirgunaseelan/

Summary

Master's in Computer Science specializing in Cybersecurity at the University of Massachusetts Lowell, graduating December 2025. Strong background in software development, algorithms, and systems with hands-on projects in security and software engineering.

Skills

- **Programming Languages**: Python, C, C++, HTML/CSS, JavaScript and SQL.
- **Frameworks/Libraries**: SFML, Flutter, jQuery UI, React, Bootstrap, Node.js, Express.js, REST API, OpenCV, TensorFlow, PyTorch, Keras, scikit-learn, NumPy, and Pandas.
- **Software/Tools**: Visual Studio Code, GitHub, Git, Oracle VirtualBox, Linux, Ubuntu, Kali Linux, Putty, and Wireshark.

Education

- **Master of Science (M.S.) in Computer Science - Cybersecurity** September 2024 – December 2025
  University of Massachusetts Lowell, Lowell, MA
  GPA: 3.60/4.0
  Coursework: *Algorithms, Data Communications, Database, Natural Language Processing, Computer & Network Security, Malware Analysis, Artificial Intelligence, Fundamentals of Robotics, Computer Architecture and Design, Intrusion Detection Systems.*

- **Bachelor of Science (B.S.) in Computer Science** September 2021 – August 2024
  University of Massachusetts Lowell, Lowell, MA
  GPA: 3.40/4.0 Honors: Cum Laude, Dean's List

Experience

Graduate Grader/TA – COMP 5420/4420 Natural Lang. Proc. September 2025 – December 2025
University of Massachusetts Lowell – Department of Computer Science *Supervisor: Prof. Hadi Amiri*

- Evaluate technical assignments, midterms, and final project for the graduate-level NLP course. Answering student queries and providing feedback. Developed the course website using jemdoc.
- Ensure timely and accurate evaluation of students' work in alignment with instructor guidelines.

Graduate Researcher – KCS Science Masters Program May 2025 – August 2025
University of Massachusetts Lowell – Kennedy College of Sciences *Supervisor: Prof. Sashank Narain*

- Designed a machine learning-based hybrid Intrusion Detection System pipeline that combines a Bi-LSTM on temporal flow windows with a LightGBM classifier on tabular features, plus a rule-based logic layer. Tuned confidence thresholds per dataset to classify traffic as Normal, Known Attack, Suspicious, or Zero-Day, reducing false positives while isolating ambiguous cases for analyst review.
- Preprocessed and harmonized NSL-KDD, CIC-IDS-2017, and UNSW-NB15 datasets (imputation, encoding, scaling, sliding-window generation). Achieved >99% precision for high-confidence Known Attack/Normal labels on NSL-KDD and CIC-IDS-2017, and $\approx 89\%$ on UNSW-NB15, with ambiguous flows safely routed to Suspicious/Zero-Day bins.
- Enhanced explainability by integrating XAI tools: applied LIME to LightGBM and SHAP to LSTM outputs. Verified SHAP additivity ($\sim 10^{-10}$ residuals), and introduced a coherence rubric to map top features into domain categories, utilizing a zero-shot LLM fallback for unexplained features, to improve analyst trust and decision-making quality.

Projects

- **Wearable Recovery and Stress Monitoring (Python, Transformer, HMM, Time-Series ML)**: Analyzed the LifeSnaps Fitbit dataset by merging daily wearable metrics with STAI stress and PANAS affect surveys. Built a preprocessing pipeline (imputation, scaling, 20-day sliding windows) and implemented a Transformer classifier from scratch using NumPy to predict next-day stress, alongside a 5-state Gaussian HMM. The HMM achieved 88.7% alignment with high-confidence labels, illustrating the trade-off between the Transformer's predictive flexibility and probabilistic interpretability. **Tech:** Python, NumPy, scikit-learn, Matplotlib, custom Transformer, Gaussian HMM (March 2025 – May 2025)
- **Web Application Vulnerability Scanner (Python, Flask, Security Testing)**: Coordinated a 3-person team to build a Python/Flask web scanner that tests deployed sites for SQL injection, cross-site scripting, insecure headers, cookie flags, SSL/TLS issues (weak ciphers, deprecated protocols, missing forward secrecy, Heartbleed), and basic network misconfigurations such as open ports and directory traversal. Implemented threaded scan orchestration and analysis modules (Requests, Scapy, sslyze), and added a web interface and PDF reporting that group findings by severity and include remediation summaries. **Tech:** Python, Flask, Requests, Scapy, sslyze, FPDF, threading (February 2025 – May 2025)
- **Cozmo Robot Programming (Python, Mobile Robotics, Sensor Fusion)**: Implemented navigation algorithms for the Cozmo Robot, improving pathfinding accuracy through sensor fusion and environmental representation. Leveraged OpenCV to detect colored cubes and utilized the Rapidly-exploring Random Tree (RRT) algorithm for optimal pathfinding. Implemented a finite state machine for task execution based on AR markers, enhancing precision in target detection. Applied Monte Carlo localization using particle filters, significantly improving the robot's navigation and task completion efficiency. **Tech:** Python, OpenCV, RRT algorithm, Monte Carlo localization (January 2024 – April 2024)