HAMZA KADDOUR

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Summary

Software Engineer with extensive experience in developing AI and machine learning solutions using Python, JavaScript, and automation scripts. Delivered efficient, scalable systems for object detection and cloud security by integrating complex, multi-platform environments. Proven track record in testing, debugging, and collaborative design to enhance performance and safety.

Skills

- **Programming Languages**: Python, Java, JavaScript, C, C++, SQL
- **Tools**: Docker, Git, Jira, MySQL, TensorFlow, NumPy, Pandas, Splunk, Microsoft Office
- **Concepts**: Cybersecurity, Machine Learning, Deep Learning, Cloud Security, DevSecOps, CI/CD, Computer Vision, AI Software Development, Analytical Thinking

Experience

Stevens Institute of Technology   **Jul 2025 - Present**
Software Engineer (AI & Cloud) - Researcher   *Hoboken,NJ*
- Streamlined laboratory operational projects using AWS and Git/GitHub, enhancing project pipeline efficiency in both Linux and Windows environments.
- Maintained and optimized the department's network, IT infrastructure, and HPC systems, ensuring reliable operational performance.
- Integrated Python, JavaScript, and YAML scripts to automate IT tasks such as deployment, VM network monitoring and segmentation, and database management (DynamoDB and MySQL), resulting in improved task efficiency.
- Tested code security, conducted unit-testing, and performed comprehensive code reviews to uphold high security and quality standards.
- Researched and developed AI and reinforcement learning techniques for object detection, contributing to improved detection accuracy and advancing the integration of AI models.

Idaho State University   **Jan 2024 - Jun 2025**
Data Scientist - Research Assistant   *Idaho Falls, ID*
- Developed a Web Security Scoring application using APIs and scripts with Python, JavaScript, HTML, CSS, and ReactJS to enhance security assessments for 1000 domains monthly.
- Designed and trained a hierarchical face recognition and deep fake image classification system using machine learning techniques, achieving 91.6% precision in image verification and leveraging computer vision concepts.
- Delivered programming courses focused on object-oriented programming (OOP) and software engineering, strengthening student comprehension and practical application of core concepts.
- Investigated reinforcement learning applications to optimize cybersecurity and Quality of Service in 5G architectures using Deep Q Network with Optuna, achieving an average reward of 0.12.
- Published a research paper titled "Evaluating the Performance of Machine Learning-Based Classification Models for IoT Intrusion Detection" in the IEEE ORSS conference 2024.
- Co-authored a research paper entitled "Altering 5G Network Parameters using Deep Reinforcement Learning to Optimize QoS and Security" in the IEEE VCC conference 2024 with Idaho National Laboratory.
- Implemented Java-based simulations for testing network transition behavior and utilized MySQL for data management to improve network performance predictions.

Responsible Cyber   **Feb 2022 - Dec 2023**
Cybersecurity Software Engineer   *Singapore*
- Integrated two third-party tools, five security APIs, and fifteen internal scripts (using Linux Bash and PowerShell) with Git and Jira into a web application to scan over 10,000 domains regularly via cron jobs.
- Optimized legacy codebases and implemented modern development standards, achieving a 98% reduction in memory consumption and significantly reducing database search and management time by up to 50x using MySQL and Pandas.
- Developed and unit-tested over 15 automation scripts using Java and Python to enhance security analytics, thereby improving threat detection capabilities.
- Conducted comprehensive unit tests on new AWS Lambda functions and step functions using Python prior to deployment.
- Created predictive models in Python that enhanced security compliance for 80 small and medium businesses, achieving an accuracy of 87.1% and an F1-Score of 87.9% across functions including attack surface discovery, cyber risk assessment, and incident response.

2SB   **Sep 2021 - Jan 2022**
Cloud Security Engineer Intern   *France*
- Simulated cloud-based services (NextGen Proxy & CASB) using Netskope, thereby enhancing service testing and validation processes.
- Managed incidents for monitoring company and client networks using TCP/IP, DNS, Firewall, and Splunk, significantly improving network security and incident response times.

ITSERV   **Jun 2021 - Sep 2021**
DEVSECOPS Engineer Intern   *Tunis, Tunisia*
- Integrated three agile security tests (SAST, DAST, and IAST) into a CI/CD pipeline using GitLab, maintaining a high-speed operation of 98.5%.
- Assisted over 20 clients in troubleshooting cloud security issues using Python and Splunk in white and grey configurations, enhancing their overall security posture and compliance.

Education

Idaho State University   **Jan 2024 - May 2025**
Master of Science, Computer Engineering   *Pocatello, ID*
- **GPA:** 4/4
- **Coursework:** Software Engineering, C/C++, Object-Oriented-Programming, JAVA, Docker, Data Science, REST API, Advanced Algorithms, Complexity, Cybersecurity, Cryptography, Python, Deep Learning , Reinforcement Learning

Higher University of Communication of Tunis (SUP COM)   **Sep 2017 - Sep 2022**
Bachelor of Science, Computer and Telecommunication Engineering   *Tunis, Tunisia*
- **GPA:** 4/4
- **Coursework:** Data Structures and Algorithms, Software Development, Python, C, SQL, JAVA, Operating Systems (Linux, Windows), Virtualization, Spring Boot, Secure Coding, Network protocols, Data Science, Machine Learning, Internet of Things, Software Engineering, English

Publications

- Hamza Kaddour et al.."Evaluating the Performance of Machine Learning-Based Classification Models for IoT Intrusion Detection".- 2024 IEEE Opportunity Research Scholars Symposium (ORSS), Atlanta, GA, USA, 2024.
- Hamza Kaddour, Israel G. Olaveson, Cameron J. Krome and Mostafa M. Fouda."Altering 5G Network Parameters Using Deep Reinforcement Learning to Optimize QoS and Security".2024 IEEE Virtual Conference on Communications (VCC), NY, USA, 2024.
- Israel G. Olaveson, Hamza Kaddour, Cameron J. Krome and Mostafa M. Fouda."QoS_5G_Sec Dataset: A Comprehensive Dataset with Analysis of Quality of Service and Security in 5G Network Architectures".
- Hamza Kaddour, Eslam Hasan, Mostafa M. Fouda, Muhammad Ismail, Zubair MD Fadlullah, and Nei Kato."Generalizable Deep Reinforcement Learning-Based Intelligent Handover in Indoor WiGig Networks".IEEE Conference on Vehicular Technology (VTC) 2025.

Languages

- English (Full professional proficiency (TOEFL iBT))
- Arabic (Native)
- French (Native)