ARKA GHOSH

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EDUCATION

George Mason University, Fairfax, VA, USA — 2024 - Present
PhD Information Science and Technology — *4.0/4.0 GPA*

Digital University Kerala (Formerly IIITM-K), India — 2022 - 2024
M.Sc. Computer Science with specialization in Cybersecurity — *8.44/10 CGPA (2nd in Class)*

University of Calcutta, India — 2019 - 2022
B.Sc. Computer Science — *8.71/10 CGPA (5th in class)*

EXPERIENCES

Internships:

· **Graduate Research Assistant, George Mason University(June 2025-August 2025)**

Developed an AI-powered tutoring agent for ethics training for an undergraduate course.

Applied RAG for context-specific feedback by the agent for the students.

Deployed the AI agent on GMU's internal server, enabling secure and direct access for students.

· **Graduate Teaching Assistant, George Mason University(Aug 2024-Present)**

Assisted in a course that teaches server-side scripting using Node.js with emphasis on secure coding practices.

· **R&D Intern -Centre for Distributed Computing, Jadavpur University(Feb 2024-July 2024)**

Designed and tested Moving Target Defense (MTD) strategies for Software-Defined Networking (SDN), improving resilience against targeted attacks.

· **R&D Intern -Centre for Digital Transformation and Innovation(Oct 2023-Feb 2024)**

Worked on computer vision research, contributing to the development of innovative solutions.

· **Research Intern -George Mason University(July 2023-Aug 2023)**

Conducted novel research on network intrusion detection rule optimization using genetic algorithms under Dr. Massimiliano Albanese, which resulted in a paper in SECRYPT 2024.

· **Penetration Tester Trainee -Techgyaan Technologies(Dec 2021)**

Identified and documented 30+ vulnerabilities in sandbox systems, leading to enhanced mitigation protocols.

· **Technical Content Writer for DataFlair(July 2021-Sept 2021)**

Authored articles on emerging Java technologies, helped increase site traffic by SEO.

Managerial Roles:

· **Hack-X Cybersecurity Society Founding Member.** Organized CTF competitions, seminars, and other activities related to cybersecurity.

· **Placement Cell DUK core team Member.** Roles include management of various placement activities.

PUBLICATIONS AND CONFERENCES

Improving the Efficiency of Intrusion Detection Systems by Optimizing Rule Deployment Across Multiple IDSs — SECRYPT
21st International Conference on Security and Cryptography — *2024*

- This paper proposes a novel approach for strategic rule deployment in Intrusion Detection Systems (IDS) using attack graph-based modeling and network topology knowledge, balancing load across IDSs under capacity constraints. A practical heuristic solution based on a genetic algorithm is presented to optimize rule deployment.

  `http://dx.doi.org/10.5220/0012814500003767`

Ensemble Learning And its Application in Spam DetectionICCECE
*International Conference on Computer, Electrical & Communication Engineering*2023

- Ensemble learning is employed to enhance email classification by considering distinct features of spam mails. Four diverse models, SVM, MNB, RF, and DT, are used for max voting. After evaluating various combinations, the optimal result is achieved by combining SVM, MNB, and DT.

  `https://ieeexplore.ieee.org/document/10085378`

SKILLS

AI & Data Science: Machine Learning, Deep Learning, NLP, Ensemble Learning, Neural Networks, GenAI, AI Agents

Cybersecurity Tools & Techniques: Intrusion Detection Systems (IDS), Penetration Testing, Vulnerability Assessment, Ethical Hacking, Moving Target Defense, SDN Security, MITRE ATT&CK Framework, Kali Linux Tools

Programming & Frameworks: Python, C++, Java, Flask, Node.js, JavaScript, MySQL, GIT, Streamlit, Gradio

Networking: Network Troubleshooting, Protocol Debugging, Network Simulation(GNS3), Routing, Switching

DevOps & Deployment: Server Deployment, Linux Server Administration, Internal Network Hosting, API Integration, Scripting for Network Monitoring

ACHIEVEMENTS AND CERTIFICATIONS

IEEE ComSoc SNTC Student Competition2025

- Gold Award in the international proposal writing competition, where there were participants from all around the world.

Outstanding Academic Performance Award2024

- Awarded for my performance in academics and extracurricular activities.

CCNAv7.02024

- M1 - Introduction to Networks
- M2 - Switching, Routing, and Wireless Essentials
- M3 - Enterprise Networking, Security, and Automation

Smart India Hackathon Internals2023

- First Runner-up in SIH 2023 internals.

CTF 1.02022

- First Runner-up Organized by KSAAC `https://ksaac.duk.ac.in/event_past.php`

Cybersecurity and Ethical Hacking Course2021

- Cyber Security and Ethical Hacking for Beginners and Advanced from GUVI Geek.

IIT Madras Certified Python Course2021

- Completed an in detailed course on python programming under distance learning by IIT Madras.