Arka Ghosh

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Summary — Cybersecurity Ph.D. candidate with expertise in network security, AI applications, and practical research solutions. Developing innovative cybersecurity strategies and contributing to academic advancements through publications.

Education

George Mason University, Fairfax, VA, USA   **2024 - Present**
PhD Information Science and Technology, Concentration in Cybersecurity   *4.0 GPA*
Digital University Kerala (Formerly IIITM-K), India   **2022 - 2024**
M.Sc. Computer Science with specialization in Cybersecurity   *8.44 (2nd in Class)*
University of Calcutta, India   **2019 - 2022**
B.Sc. Computer Science   *8.71 CGPA (5th in class)*

Publications and Conferences

Improving the Efficiency of Intrusion Detection Systems by Optimizing Rule Deployment Across Multiple IDSs
21st International Conference on Security and Cryptography, SECRYPT   *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 Detection
International Conference on Computer, Electrical & Communication Engineering, ICCECE   *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

Research	Network Security, AI for Cybersecurity, Machine Learning	**OS**	Kali Linux, Ubuntu, Cisco IOS
Web Dev	HTML, CSS, Flask, Php, JavaScript, WordPress	**Simulations**	GNS3, Cisco Packet Tracer
Languages	C, C++, Python, Java	**Others**	Guitar, Ukulele, Harmonica, Painting, Abacus(Level 8)

Experience

George Mason University   **August 2024-Present**
Graduate Teaching Assistant
– IT 207- The course focuses on server side scripting using NodeJS
Responsibilities
– Grading Labs and Assignments
– Assisting Students with labs
– Holding special lab sessions to help with logic building.

Centre for Distributed Computing, Jadavpur University   **February 2024-July 2024**
R&D Intern
Research
– Advantages of Moving Target Defence
– Advantages of Software Defined Network in MTD.
Development
– Developed an innovative solution that performs IP shuffling and port hopping automatically.

Centre for Digital Transformation and Innovation   **October 2023-February 2024**
R&D Intern
Research
– In-depth research on various techniques available for measuring the distance and dimensions of objects.
– Finding an innovative solution to perform object detection and distance estimation of finding the depth of an object.

– Drafting a survey paper.

Development

– An innovative solution to find the depth of an object without the use of multiple camera sensors.

Center for Secure Information Systems, GMU   **July 2023-August 2023**

Research Intern

Research

– Novel research in network defense to optimize the placement of rules in a Multi IDS environment.
– Simulation of enterprise networks to perform large-scale experiments to see the efficiency of the developed solution.
– Drafting a paper for peer review.

Techgyaan Technologies   **December 2021**

Penetration Tester Trainee

– Conducted comprehensive penetration testing and documentation in a sandboxed environment.
– Identified and reported 30+ vulnerabilities, leading to enhanced security protocols.

DataFlair   **July 2021-September 2021**

Technical Content Writer

– Authored articles on emerging Java technologies
– Helped increase site traffic by SEO

Projects

Flask Web Application Development   **2019**

– Created a user-friendly web application using Flask that uses an ensemble learning method and helps detect if a given email/message is spam or ham.
– https://ensemblespamdetector.onrender.com/

Wordpress Website   **2019**

– Created a website using WordPress, elementor.
– Contains all my previous projects in this website.
– https://arkag30.github.io/MyProjects/

Managerial Roles

Hack-X Cybersecurity Society Founding Member   **2022-2024**

– Organized CTF competitions, seminars, and other activities related to cybersecurity.

Placement Cell DUK core team Member   **2022-2024**

– Roles include management of various placement activities.

Achievements and Certifications

IEEE ComSoc SNTC Student Competition   **2024**

– Gold Award in the international competition where there were participants from all around the world.

Outstanding Academic Performance Award   **2024**

– Awarded for my performance in academics and extracurricular activities in my Masters.

CCNAv7.0   **2024**

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

Smart India Hackathon Internals   **2023**

– First Runner-up in SIH 2023 internals organized in DUK.

CTF 1.0   **2023**

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

Entrepreneurship Cell IIT Kharagpur Penetration Testing Winter Camp **2021**

– Winter Camp training program on Penetration Testing in association with E-Cell IIT KGP.

Cybersecurity and Ethical Hacking Course   **2021**

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

Guinness Book Of World Record   **2021**

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

IIT Madras Certified Python Course   **2021**

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