

ABHINAYA S B

Human-Centered Security & Privacy Researcher

Ph.D. Student, Dept. of Computer Science, North Carolina State University
Raleigh, NC | asrivid@ncsu.edu | abhinayasb.github.io | linkedin.com/in/sbabhinaya

Professional Summary

- 6+ years of cumulative experience in Security, Privacy & Online Safety Research, ML, NLP, and Software Development.
- Research leveraging **NLP**, text-based and multi-modal **LLMs** to combat **online harassment** and study **scams** at scale.
- Expertise in designing and conducting **qualitative** and **quantitative studies** to investigate security, privacy and online safety threats in emerging technologies, including virtual reality (VR) systems and voice assistants. Multiple publications at top-tier security and privacy conferences (USENIX Security, IEEE Security & Privacy, PETS).

Education

North Carolina State University (NCSU), Raleigh, USA

PhD in Computer Science; *Advised by Dr. Anupam Das (WSPR lab)*

Aug 2022 - Present (est. 2026)

CGPA: 4.00/4.00

National Institute of Technology, Tiruchirappalli, India

Bachelor of Technology (Honours) in Computer Science and Engineering

Jul 2015 - May 2019

CGPA: 9.74/10.00

Employment & Experience

Research Experience: Graduate Research Assistant, WSPR lab, NC State University

Aug 2022 - Present

- **Analyzing ad prevalence, characteristics, and compliance in Alexa skills** (IEEE S&P, 2025, C2)
Developed an automated ad detection pipeline using a fine-tuned LLM using chain-of-thought prompting, identifying and characterizing various types of policy-violating advertisements on the platform.
- **Understanding privacy expectations, concerns and behaviors of VR users** (PETS, 2025, C1)
Led the design of and conducted an interview-based study with VR users to elicit their diverse perceptions regarding the data practices of VR companies, their privacy concerns with using VR systems, and the steps they took to protect their privacy. Contrasted findings with observations from other technologies and ecosystems.
- **Understanding parents' perceptions and practices toward children's S&P in VR** (IEEE S&P, 2024, C4)
Designed and conducted an interview-based study with parents of child VR users to extract insights about parents' security and privacy (S&P) knowledge, perceptions, and practices towards addressing their children's S&P.
- **Investigating harassment and safety mechanisms in VR** (USENIX Security, 2024, C3)
Designed and led a multi-perspective interview study with (i) VR users and (ii) VR developers to identify the challenges in existing VR safety controls faced by VR users, and contrast them with the challenges developers experience in designing and implementing these safety mechanisms.

Teaching Experience: Graduate Teaching Assistant, NC State University

- CSC 433 Privacy in the Digital Age Jan 2023 - May 2023
- CSC 326 Software Engineering Aug 2022 - Dec 2022

Industry Experience

- **Engineer, Qualcomm India Pvt. Ltd.** Dec 2020 - Jun 2022
Designed a prototype to optimize memory for concurrent workloads on the AI-processor
Added testing support for 2 simulators, 1 emulator, 2 Linux and 1 Windows based platforms.

- Associate Engineer, Qualcomm India Pvt. Ltd.** Jul 2019 - Nov 2020
 Developed a suite of tests and tools for Qualcomm’s AI-processor that identified 5 critical HW issues; presented work at internal conferences (Qbuzz, ML Summit) with 3K+ attendees.
- Interim Engineering Intern, Qualcomm India Pvt. Ltd.** May 2018 - Jul 2018
 Analyzed Google’s Pixel Visual Core based image capture to derive architectural insights.
- Eklavya Internship, IIT Bombay** May 2017 - Jul 2017
 Developed a “Database to Animation Framework” using Java servlets and ThreeJS.
- Winter Intern, WeCP – We Create Problems** Dec 2016 - Jan 2017
 Implemented a client management tool end-to-end using MEAN stack.

Skills

Programming	Python, C++, C, Java, Tensorflow, HTML/CSS, Javascript, Shell
Tools	LaTeX, Git, <i>ollama</i> , <i>vllm</i> , Gradio, MongoDB, Dedoose, Android Studio, MATLAB, Trace32, Zotero
Methods	Natural Language Processing, Clustering, Prompt Engineering, LLM Fine-tuning, Multimodal RAG, LLM Agents, Survey Design, Interview Design, Qualitative Analysis, Statistical Analysis
Courses	Privacy in the Digital Age, Computer & Network Security, Software Security, Human-Centered Research Methods, Cryptography, Cellular & Telephone Network Security, Human-Centered Security, Advanced Network Security, Algorithms, Computer Networks

Publications

Peer-Reviewed Conference Publications

- C1 “What are they gonna do with my data?”: Privacy Expectations, Concerns, and Behaviors in Virtual Reality
 Abhinaya S.B., Abhishri Agrawal, Yaxing Yao, Yixin Zou, Anupam Das
 Privacy Enhancing Technologies Symposium (PETS), Jul 2025. [paper]
- C2 Analyzing Ad Prevalence, Characteristics, and Compliance in Alexa Skills
 Aafaq Sabir, Abhinaya S.B., Dilawer Ahmed, Anupam Das
 IEEE Symposium on Security and Privacy, May 2025. (Acceptance Rate: 14.8%) [paper]
- C3 Enabling Developers, Protecting Users: Investigating Harassment & Safety in VR
 Abhinaya S.B., Aafaq Sabir, Anupam Das
 USENIX Security Symposium, Aug 2024. (Acceptance Rate: 18.3%) [paper]
- C4 Understanding Parents’ Perceptions and Practices Toward Children’s Security and Privacy in Virtual Reality
 Jiaxun Cao, Abhinaya S.B., Anupam Das, Pardis Emami-Naeini
 IEEE Symposium on Security and Privacy, May 2024. (Acceptance Rate: 17.8%) [paper]
- C5 A Question Answering and Quiz Generation Chatbot for Education
 A S Sreelakshmi, Abhinaya S.B., Aishwarya Nair, S Jaya Nirmala
 Grace Hopper Celebration India (GHCI), Nov 2019. [paper]

Peer-Reviewed Journal Publications

- J1 Unveiling Users’ Security and Privacy Concerns Regarding Smart Home IoT Products from Online Reviews
 Taufiq Islam Protick, Aafaq Sabir, Abhinaya S.B., Aiden Bartlett, Anupam Das
 ACM Journal on Computing and Sustainable Societies, Aug 2024. [paper]
- J2 A Survey of Techniques for improving Security of GPUs
 Sparsh Mittal, Abhinaya S.B., Manish Reddy, Irfan Ali
 Journal of Hardware and Systems Security, Sep 2018. [paper]

Posters

P1 Virtual Adventures, Real Challenges: Analyzing Harassment Controls in VR

Abhinaya S.B., Aafaq Sabir, Anupam Das

USENIX Security Symposium, Aug 2023.

[poster]

P2 Protego Totalum! Mitigating Harassment in Virtual Reality

Abhinaya S.B., Aafaq Sabir, Anupam Das

Graduate Student Research Symposium, NC State University, Apr 2023.

[abstract]

Service

- Artifact Evaluation Committee: USENIX Security'23, USENIX Security'24, USENIX Security'25
- External Reviewer: ACSAC'23, CCS'23, IEEE S&P'24, PETS'24, CHI'24, CSCW'24, USEC'24, S&P'25

Awards & Honors

- **PETS'25 Travel Stipend:** Awarded 650 USD to attend Privacy Enhancing Technologies Symposium in Jul 2025
- **USENIX Security'24 Diversity Grant:** Awarded 625 USD to attend USENIX Security Symposium in Aug 2024
- **Graduate Merit Award:** Awarded 3000 USD by the College of Engineering, NCSU in Mar 2024
- **RSA Security Scholar:** Selected as a Security Scholar to attend the RSA conference, in Nov 2023
- **USENIX Security'23 Diversity Grant:** Awarded 850 USD to attend USENIX Security Symposium in Aug 2023
- **GREPSEC Scholar:** Awarded 970 USD to attend the GREPSEC VI workshop in Aug 2023
- **Graduate Enhancement Award:** Awarded 2850 USD by the College of Engineering, NCSU in Apr 2023
- **North Carolina State University Graduate Fellowship:** Awarded 4000 USD by NCSU in Feb 2022

Invited Talks & Lectures

- **“What are they gonna do with my data?”: Privacy Expectations, Concerns, and Behaviors in VR**
Conference presentation, 25th Privacy Enhancing Technologies Symposium (PETS), Washington, DC, USA Jul 2025
- **Towards Better Privacy & Safety for VR Users**
Invited Talk, Triangle Area Privacy and Security Day (TAPS), Duke University Oct 2024
- **Human-Centered Security & Privacy Research for Virtual Reality**
Classroom lecture, CSC 801: Seminar in Computer Science, North Carolina State University Sep 2024
- **Panel discussion for early-stage PhD students**
Panelist, CSC 801: Seminar in Computer Science, North Carolina State University Sep 2024
- **Enabling Users, Protecting Developers: Investigating Harassment and Safety in VR**
Conference presentation, 33rd USENIX Security Symposium, Philadelphia, PA, USA Aug 2024
- **Enabling Users, Protecting Developers: Investigating Harassment and Safety in VR**
Invited talk, 3rd annual North Carolina Cybersecurity Symposium Feb 2024

Select Media Coverage

- NC State Alumni Magazine – “Headset Harms”
- NC State News – “VR Poses Privacy Risks for Kids. A New Study Finds Parents Aren’t as Worried as They Should Be.”
- Duke Today – “Parents Underestimate the Privacy Risks Kids Face in Virtual Reality.”

Leadership

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| • Interview Prep Nights Committee, Women in Computer Science (WiCS), NCSU | Jul 2023 - May 2024 |
| • Vice President, Public Relations, Qonverse Toastmasters Club, Bangalore | Jul 2021 - Dec 2021 |
| • Secretary, Qonverse Toastmasters Club, Bangalore | Jan 2022 - Jun 2022 |

Mentoring

- Abhishri Agrawal, UNC-Chapel Hill
- Dinesh Karnati, North Carolina State University
- Tarun Puvvala, North Carolina School of Science and Mathematics
- Noah Chang, North Carolina School of Science and Mathematics