Ritik Roongta

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Research Statement

My aim is to develop open source robust frameworks that create a tangible, positive impact on society while pushing academic research forward. I intend to transform the digital advertising landscape by building reliable content moderation tools. In the past, I have worked on evaluating the effectiveness of privacy-enhancing browser plugins and the propagation of propaganda and problematic ads across the web ecosystem, leveraging large language models to detect and mitigate these issues.
Looking ahead, my objective is to develop a modern adblocker equipped with advanced ad moderation capabilities that can prevent harmful content from reaching users. In addition, this innovation would help minimize excessive tracking and play a critical role in combating fraud and scams.

Education

New York University **Sep '21 – May '26**
Ph.D. in Computer Science, Advisor: Prof. R. Greenstadt & Prof. BD. Gavitt *New York City, USA*

IIT Bombay **Sep '17 – May '21**
B.Tech in Computer Science, GPA: 8.15/10.0 *Mumbai, India*

Publications

Automated detection and evaluation of problematic 'allowed' advertisements **Feb '25**
Ritik Roongta, Julia Jose, Hussam Habib and Rachel Greenstadt *PETS (under review)*

- Developed an LLM-assisted Ad content moderation framework to enable adblockers to detect problematic ads and block them, thus protecting users from excessive tracking and intrusive advertising

Propaganda Generation by Large Language Models **Feb '25**
Julia Jose, Ritik Roongta and Rachel Greenstadt *ACL (under review)*

- Uncovered the potential of LLMs in generating propaganda and designed NLP-based frameworks to efficiently detect and mitigate them, shielding users from false and fake content

A User-Focused Evaluation of Privacy-Preserving Browser Extensions **July '24**
Ritik Roongta and Rachel Greenstadt *AsiaCCS*

- Built a usability and privacy framework to evaluate privacy-preserving extensions on performance, permission abuse, web compatibility, etc., aiding the users in making informed choices

Analysis of web breakages caused by adblockers **May '24**
Ritik Roongta, Mitchell Zhou, Ben Stock and Rachel Greenstadt *SecWeb, S&P*

- Conducted web measurement experiments to quantify web breakages caused by adblockers across five different categories, thus improving the state of web for adblocker users

Drifuzz: Harvesting Bugs in Device Drivers from Golden Seeds **Aug. '22**
Zekun Shen, Ritik Roongta, and Brendan Dolan-Gavitt *USENIX*

- Implemented a framework for concolic fuzzing PCI device drivers, discovering and patching **12 bugs** and obtained **2 CVEs** in the Linux driver code, leading to a bug-free operating system

Awards / Leadership

- Received a **scholarship** to attend summer school in EPFL, Switzerland to foster collaborations [2024]
- Received a **travel grant** to attend the RightsCon conference in Costa Rica to get policy exposure [2023]
- Received **SoE** fellowship from NYU in my freshmen year to facilitate my research goals [2021]
- Secured All India Rank **48** in **JEE-Advanced** out of 220,000 shortlisted candidates [2017]
- Awarded **Pratibha Scholarship** for exceptional academic excellence by the Aditya Birla Group [2017-21]
- Awarded **KVPY** Fellowship and **NTSE** Scholarship by the Government of India [2016]
- Received **0.1% Certificate of Merit** in Chemistry and Physics by the Government of India (AISSCE) [2017]

Internship Experience

CISPA Helmholtz Center for Information Security **Jun – Aug '24**
Visiting Scholar | ***Guide: Ben Stock*** *Saarbruecken, Germany*

- Developed a novel mechanism to identify the **differential treatment** of adblocker users by websites, uncover potential for fingerprinting users and degrading their user experience
- Instrumented the Google Chrome's V8 engine to collect JS execution logs to understand its inner workings

University of California, Santa Barbara **Apr – Nov '20**
Research Intern | ***Guide: Giovanni Vigna and Christopher Kruegel*** *Santa Barbara, USA*

- Developed **KANF**, a kernel-assisted network fuzzer, using Linux kernel driver modules and networking tools to test **over 10,000** open-source network programs and conduct bug detection at scale
- Interleaved the Linux Kernel with (**AFL**) using kernel driver modules and network programs

A.P.T Portfolio **Apr – Jun '20**
Software Engineer Intern | ***Guide: Pratyush Rathore*** *Delhi, India*

- Reported and **patched** crucial **bugs** in the source code implemented for processing a daily **traffic** in excess of **4 crores** orders at NSE and developed and optimized **dynamic latency** based exchange simulation model

Lucideus **May – Jul '19**
Cyber Security Research Intern | ***Guide: Rahul Tyagi*** *Delhi, India*

- **Hardened** CentOS linux using 239 remediations as provided by **CIS** (Center for Internet Security) and prepared a detailed documentation covering attacks and mitigation techniques on **OWASP** Top 10 Attacks

Reviewer Duties

Program Committee: NDSS '25, PETS '24, MADWEB '25
Artifact Committee: CCS '24/25, USENIX '23/24, PETS '25

Position of Responsibility

General Secretary **Jul '20 – May '21**
IIT Bombay | ***CSE Association*** *Mumbai, India*

- Headed a team of **24+ students** for organizing various remote and in-person sports and social events along with student **wellness** webinars with an annual budget in excess of **INR 3.5 lakhs**
- **Ideated 7+** engaging events and conducted them in an online manner during the remote semester

Community Service

Teaching Assistant **Jan '22 - Apr '22**
New York University | ***Application Security*** *New York, USA*

- Mentored a class of over 100 students in a remote setup for the Application Security course and facilitated practical class demonstrations to instill a better understanding of niche concepts

REVA Mentor **Nov '17**
IIT Bombay | ***India's Largest Fest for Underprivileged Kids*** *Mumbai, India*

- Mentored over 200 **under-privileged** students in various **Recreational** Activities and **interactive sessions** organized during **REVA fest** to bring them into mainstream world

Technical Skills

Machine Learning: NLP, Computer Vision, Prompt Engineering
Internet Measurement: Puppeteer, Selenium, Playwright
Languages: C/C++, Python, Bash, Java, Assembly, JavaScript
Software tools: Puppeteer, Selenium, Git, MATLAB, MySQL, AutoCAD, CMake, LaTeX, AWS
Pentesting: Kali Linux, Metasploit Framework, Xerosploit, Reversing Tools