

Priyanka Bose

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Research Interests

My research interest is in the domain of systems, software security, and decentralized finance (DeFi). Specifically, I develop program analysis techniques to discover vulnerabilities in real-world applications, such as, but not limited to blockchain, smart contracts and Android apps.

Education

- 2016–Present **Ph.D.**, *University of California, Santa Barbara*, GPA – 4.0/4.0.
Computer Security, advised by Giovanni Vigna & Christopher Kruegel
- 2016–2022 **MS**, *University of California, Santa Barbara*, GPA – 4.0/4.0.
Computer Security, advised by Giovanni Vigna & Christopher Kruegel
- 2013–2015 **MS**, *Indian Institute of Technology, Madras*, GPA – 9.0/10.0.
Computer Science & Engineering, advised by PanduRangan Chandrasekaran
- 2007–2011 **B.Tech.**, *Institute of Engineering & Management, Kolkata*, GPA – 9.05/10.0.
Computer Science & Engineering

Professional Experience

- 2016–Present **Graduate Student Researcher**, *University of California, Santa Barbara*, Santa Barbara.
- 2015–2016 **Post-Graduate Research Intern**, *School of Computing (SoC), National University of Singapore (NUS)*, Singapore.
- 2013–2015 **Teaching Assistant**, *Indian Institute of Technology (IIT), Madras*.
- 2011–2013 **Systems Engineer**, *Infosys Limited*, Bhubaneswar.

Publications

- [7] **P. Bose**, D. Das, S. Vasan, S. Mariani, I. Grishchenko, A. Continella, A. Bianchi, C. Kruegel, and G. Vigna, “Columbus : Android App Testing Through Systematic Callback Exploration,” in *International Conference on Software Engineering (ICSE)*, 2023.
- [6] **P. Bose**, D. Das, Y. Chen, Y. Feng, C. Kruegel, and G. Vigna, “Sailfish: Vetting Smart Contract State-Inconsistency Bugs in Seconds,” in *IEEE Symposium on Security and Privacy (IEEE S&P)*, 2022.
- [5] D. Das, **P. Bose**, A. Machiry, S. Mariani, Y. Shoshitaishvili, C. Kruegel, and G. Vigna, “Hybrid Pruning: Towards Precise Pointer and Taint Analysis,” in *Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, 2022.
- [4] D. Das, **P. Bose**, N. Ruaro, C. Kruegel, and G. Vigna, “Understanding Security Issues in the NFT Ecosystem,” in *Conference on Computer and Communications Security (CCS)*, 2022.
- [3] D. Meng, M. Guerriero, A. Machiry, H. Aghakhani, **P. Bose**, A. Continella, C. Kruegel, and G. Vigna, “Bran: Reduce Vulnerability Search Space in Large Open Source Repositories by Learning Bug Symptoms,” in *ACM Asia Conference on Computer and Communications Security (ASIA CCS)*, 2021.
- [2] **P. Bose**, V. T. Hoang, and S. Tessaro, “Revisiting AES-GCM-SIV: Multi-user Security, Faster Key Derivation, and Better Bounds,” in *Advances in Cryptology (EUROCRYPT)*, 2018.
- [1] **P. Bose**, D. Das, and C. P. Rangan, “Constant Size Ring Signature Without Random Oracle,” in *Australasian Conference on Information Security and Privacy (ACISP)*, 2015.

Ongoing Research Projects

NFT-MEV Analyzing trading activities of Non-Fungible tokens (NFT) to understand diverse market manipulation strategies adapted by the traders to maximize their profits.

Academic Presentations

Conference presentation **Sailfish: Vetting Smart Contract State-Inconsistency Bugs in Seconds**, *IEEE Symposium on Security and Privacy (IEEE S&P)*, May 2022.

Professional Activities

- Reported 6 high-impact security vulnerabilities with financial consequences in OpenSea, Sorare, and Rarible marketplaces (2021).
- Contributed to *Slither*, a popular smart contract static analyzer by Trail of Bits.
- Member of *Shellphish* Capture-The-Flag (CTF) team. Participated in DEFCON CTF Finals in the year 2019.
- Member of Women in Cybersecurity (WiCyS), UCSB Chapter.
- Guest speaker at Career Panel for Women in Cybersecurity (WiCyS), UCSB Chapter.

Awards / Achievements

- Received scholarship to attend *Grace Hopper Celebration'18*.
- Selected for attending *RSA Security Scholar Program'18*.
- Entitled to *Presidential Graduate Fellowship* (PGF) at *National University of Singapore* (NUS).
- Received scholarship for two years (2013 - 2015) from *Ministry of Human Resource and Development (MHRD)*, Government of India for higher studies at IIT, Madras.
- Received **National Merit Scholarship** from *Ministry of Human Resource and Development (MHRD)*, Government of India for 66th position in state in Xth standard board examination.
- Secured All-India Rank 657 among 2, 24, 160 candidates in GATE 2013.
- Secured All-India Rank 1196 among 87, 163 candidates in West Bengal Joint Entrance Examination 2007 (Engineering).

Media Coverage

- NFT Study [4] **Axetue**, *OpenSea hack verified 3 security concerns. Here's what you need to know*, (Feb 2022).
Hong Kong Security Response Team Coordinate Centre (HKCERT), *What You Know about the Cyber Security of NFT*, (Mar 2022).
Medium, *NFT Security 101*, (Mar 2022).
Sensors Tech Forum, *NFT Security and Risks: How Secure Are Your Digital Assets?*, (Feb 2022).
Merehead, *How to make NFTs secure?*, (Dec 2021).
CoinYuppie, *Do you know how to audit safe and reliable NFT projects?*, (Feb 2022).
DevNews Podcast, *Elon Musk's Twitter Takeover, Security Vulnerabilities in Web3, and Experimenting With the TikTok Algorithm*, (Apr 2022).
The Atlantic, *Please Ignore My Last 577 Tweets*, (May 2022).
TruthDAO Podcast, *NFT Academic Roundtable*, (May 2022).
TruthDAO, *Fraudulent "Wash Sales" Roil Booming NFT Market*, (May 2022).
TruthDAO, *Fake Trading, Stablecoin Troubles, and the Threat of Crypto Regulation: Our Crypto DeFined NFT Roundtable Takeaways*, (May 2022).
- Sailfish [6] **TheHackerNews**, *SAILFISH System to Find State-Inconsistency Bugs in Smart Contracts*, (Jan 2022).
IEM Labs, *SAILFISH System to Find State-Inconsistency Bugs in Smart Contracts*, (Jan 2022).
CyberFishNews, *SAILFISH System to Find State-Inconsistency Bugs in Smart Contracts*, (Jan 2022).
CyberSecurity.News, *SAILFISH System to Find State-Inconsistency Bugs in Smart Contracts*, (Jan 2022).