Renuka Kumar

She/Her/Hers | PhD Candidate | Security Researcher | Software Architect
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◊ Experience Summary

- 10+ years industry experience in Silicon Valley in software development and design lead roles that include managing remote teams for software delivery
- 5+ years of research and training experience in systems and software securit y
- Successfully led multiple high-impact security research projects in real world mobile deployments that required working end-to-end, across different layers of the protocol stack
- Proficiency in security analysis of complex software, various programming languages, and build environments

◊ Education

2019-Present:	PhD Candidate, Dept. of Computer Science & Engr., University of Michigan, Ann Arbor, GPA 4.0/4.0
2001-2003:	M.S, Dept. of Electrical Engr., University of Southern California
1996-2000:	BS, Dept. of Computer Science & Engr., Amrita Institute of Technology & Science

◊ Work Experience

Sept 2019 – Present: **Graduate Student Research Assistant, University of Michigan, Ann Arbor**
Advised by Professor Atul Prakash and Professor Roya Ensafi

- Led a high impact work on the *"Security Analysis of Unified Payment Interface and Payment Apps in India"*, published at *USENIX Security Symposium, August 2020*. Per our disclosures, the Indian government agency took critical action to address some of the core design flaws.
  - *Used JEB* for decompiling, *mitmproxy and Open VPN setup for traffic interception, Cuckoo Sandbox* for dynamic analysis, *UIAutomator* for input sniffing, *and Wireshark* for packet capture analysis
- *A Large-scale Investigation into Geographic Equity of Mobile Apps, Under Submission to USENIX Security Symposium, 2021*

Aug 2013 – Jun 2019 **Research Faculty, Center for Cybersecurity, Amrita University, India**

- Successfully architected and led a team to develop the first of its kind hybrid analysis framework to detect malicious Android apps including a comprehensive reporting system that uses MITRE's attack matrix for the Government of India
- Developed the static analyzer to detect hardcoded strings to sensitive API calls. Contributed to setting up the dynamic analysis framework using Cuckoo Sandbox, reverse engineered apps for ground truth and assisted with end-to-end integration testing.
- Select Other Projects:
  - *Towards Accuracy in Similarity Analysis of Android Applications*, published 2018

- *A Systematic Study on Static Control Flow Obfuscation Techniques*, arXiv.org

Jul 2007 –Jul 2013 **Senior Software Engineer, PLX Technology Inc. (now Broadcom), CA**

Lead Engineer for DMA-Based Networking Application (2012-2013)

- Core member of the team that designed, developed and managed PLX's SDK and GUI (the first of its kind). Instrumental in porting a Windows only (C#/.NET based) tool for cross-platform support.
- Developed all data abstractions, object hierarchies and workflow for the GUI. Created a Java RMI Server that interfaces with a C++ library using JNI for remote monitoring and debugging
- Implemented a fully automated *make-based* build environment, which includes extensive pre-processing using Shell & Perl scripts. Support in windows using DOS batch files.
- Extensively collaborated with hardware engineers for the development of PLX's drivers – including algorithms for device scanning and enumeration, I2C support etc. Extended user API library in C/C++.
- Developed an interactive application app for customers demonstrating the efficiency of the DMA-based networking feature with performance stats showing bandwidth utilization.

Jun 2003 – Jul 2007 **Member of Technical Staff, Kasenna Inc (now Espial), CA**

- Key engineer in designing workflow management of large video networks (using Java, C++ & CORBA). Single handedly developed a cache propagation algorithm to propagate content from library server to caches.
- Key architect of a Java Swing based client application that is a centralized control for a network of MediaBase servers that enabled server monitoring, content management and usage monitoring, reporting.
- Enhanced web services interface for integration with media server. The interface enables a soap client, to access services via an HTTP (Tomcat) server and Apache Axis SOAP engine.
- Extending and supporting the server-side interface to MediaBase (in C++)

Jun 2000 – Jul 2001 **Software Engineer, Patni Computer Systems, India**

- Developed a business-critical application to monitor Service Level Agreements called e-SLA using Java and JSP, with an Oracle database backend connected using JDBC. Won client appreciation for the tool.

◊ Awards & Honors

- Affiliated with honor societies Tau Beta Pi (TBP) and Eta Kappa Nu (HKN)
- Ten CVEs for vulnerabilities in Indian payment applications responsibly disclosed to vendors. Disclosures posted at https://github.com/magicj3lly/appexploits
- Grants: EMC-RSA, Defence Research and Development Organization, Govt. of India
- Academic Excellence Award, Amrita University (academic year 2014-2015)
- Multiple industry awards for excellent contribution, commitment and performance

◊ Personal

- Volunteer at Embracing the World charities for over 20 years