Sandeep Nair Narayanan

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EDUCATION

University of Maryland, Baltimore County (UMBC)   *August 2014 – 2018 (exp)*
PhD in Computer Science, GPA (3.71/4.0)

National Institute of Technology Karnataka (NITK), India   *August 2009-June 2011*
M.Tech in Computer Science & Engineering-Information Security (9.25/10)
Honors: Gold Medal for outstanding academic performance

Cochin University of Science & Technology (CUSAT), India   *August 2005 – May 2009*
B.Tech in Computer Science & Engineering (First Class with Distinction)

TECHNICAL SKILLS

Programming: C, Java, C#, Python, Perl
Operating Systems: Oracle Enterprise Linux (4 & 5), Windows XP, Windows 7
Software: Net-Beans, Vim, Microsoft Visual Studio, Eclipse, Virtual Box, Putty, MS Office

AREAS OF INTEREST

Internet of Things, Vehicular Security, Big Data Analytics, Semantic Web, Machine Learning

PROFESSIONAL EXPERIENCE

Oracle Server Technologies, India Development Center (IDC)   *June 2011 – July 2014*
Position: Senior Technical Staff (SMTS)

- Development of Oracle Java Virtual Machine (OJVM). Worked in the development and maintenance of different areas in OJVM including Just in Time (JIT) Compiler, Thread Management, Interpreter, Garbage Collection etc. Worked towards releases for Oracle RDBMS 11.2.0.4, 12i, 12.1 and several back ports to 10g and 11g.
- Implemented several native functions to update OJVM to JDK 6 and JDK 7 standards. Imported security bugs in Java into OJVM and took part in discussions with Hot spot team. Also handled the DST uptakes in OJVM
- Developed "ojvmwcu", a utility which can call web services from Oracle RDBMS released with 12.1 i.
- Created multiple scripts for automating different processes during the development of OJVM

Supercomputer Education & Research Center, IISc Bangalore   *May 2010 – June 2011*
Position: Research Intern

- Worked with CISCO routers (2821 & 2600) and tested them against multiple vulnerabilities. Used IXIA, a high performance traffic generator for testing them
- Developed a tool which can generate multiple protocol packets with customized values for different fields for the underlying protocols like TCP, UDP, IP etc
- Worked towards developing a testing framework against DoS attacks

NITK, Surathkal & UMBC
Position: Teaching Assistant

- Worked as a Teaching Assistant for courses Advanced Operating Systems, Introduction to Computer Science, Computer Networks, Automata Theory & Formal Languages, Project Management & Information Security, Information Security etc.

Professional Organizations

- **Senator** (2015-16) - UMBC Graduate Students Association (GSA)
- **Planning Committee Member**(2016)- UMBC Graduate Research Conference (GRC)
- **Secretary** (2015-16) - UMBC-ACM Student Chapter

RESEARCH PUBLICATIONS

- Zhichuan Huang, David W Corrigan, **Sandeep Narayanan**, Ting Zhu, Elizabeth Bentley, Michael Medley. "Distributed and Dynamic Spectrum Management in Airborne Networks." In 2015 IEEE Military Communications Conference (MILCOM 2015), Tampa Florida, October 2015.
- **Narayanan, Sandeep Nair**, Alwyn Roshan Pais, and Radhesh Mohandas. "Detection and Prevention of SQL Injection Attacks Using Semantic Equivalence." In *Computer Networks and Intelligent Computing*, pp. 103-112. Springer Berlin Heidelberg, 2011.
- Karande,Vishal Maruti, **Sandeep Narayanan**, Alwyn Roshan Pais,N. Balakrishnan. "Testing Resilience of Router against Denial of Service Attacks." In *Trends in Network and Communications*, pp. 107-116. Springer Berlin Heidelberg, 2011.

ACADEMIC PROJECTS

Context Aware, Semantically rich Analytics for Cyber Physical Systems

Doctoral Research
Advisor: Prof Anupam Joshi

- Smart systems including Internet of Things handles private and sensitive data which requires protection. But size and power limitations restricts the current technologies to be directly applied to them. It's more challenging to secure such systems which are already built and deployed.
- Our research focus on extracting and analyzing context to secure such systems using semantic technologies. Currently we are working on vehicles as a use case, which also follows a Sensor-ECU-Actuator architecture.

Detection & Prevention of SQLIA in ASP.NET Web Applications   *Graduate Thesis*
- This work was part of the Ministry of Communications and Information Technology (MCIT) Project, Govt. of India.
- Developed a tool SIAP, which uses configuration files to instrument ASP.NET with C# based Web Applications with custom SQLIA prevention techniques
- Designed a technique and instrumented multiple test web applications. Created a test bed with multiple test web applications and automated the testing with multiple SQL injection attack vectors using selenium.

Spectrum Management in Airborne Networks   *Graduate Research*
- We proposed a distributed framework which includes channel prediction using correlation of channel quality among aircrafts. We then used this prediction to schedule tasks for better throughput.

Hardware Based Improvements to Speedup RSA   *Course Project*
- We analyzed RSA code in PolarSSL using like V-Tunes, Valgrind and proposed a theoretical architecture to improve the encryption and decryption performance.

Security Log Analyzer   *Course Project*
- Developed a java based tool which can detect malicious activities from a log file.
- The tool used configuration files to define rules for detection. We generated rules and tested them to detect DoS occurrences from a log file.

Honey Pot Simulation   *Undergrad Minor Project*
- Implemented and simulated a honey pot IDS which analyzes the packets in the network, segregate them, log them and generate reports to the administrator using PCAP library. Used NCTUNS network simulator also for this.

Web Application Project   *Undergrad Project*
- Police Information System: A JSP based web application which can be used as a link between Police and Common man. Used JSP, MySQL and Dreamweaver
- University Forms Repository: A repository for all kinds of forms for use by students and employees of a University. Used PHP and LAMP server for development and was deployed live