

Satya Ranjan Mohanty
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OBJECTIVE

A challenging software development or corporate R&D position in Computer Networks, Operating systems and Network Storage

SKILL SUMMARY

Extensive familiarity and programming experience with the following

Operating System: Linux, 4.4 Free BSD, Solaris, Windows NT/XP, .Net
Programming Languages: C (7+ yrs.), Micro C, C++, MATLAB 6.5, VHDL, MIPS
Libraries: Berkeley Sockets, GNU GMP, Crypto, Pthreads, CSIM, LEDA, NS-2
Protocols: TCP/IP, RIP, OSPF, BGP
Scripting Languages: Perl, Tcl/Tk, Bash
Cryptographic Tools: MD5, RSA, Diffie Helman, PKCS, VPN, FreeSwan, IPsec

EDUCATION

PhD Computer Science

University of California, Riverside (UCR) (Fall '02 – Present, Exp. Graduation March '07)
MS Computer Science, UCR Fall '06

MS Electrical Engineering

University of Kentucky, Lexington (Summer 1999)

Bachelor of Technology Electrical Engineering

Indian Institute of Technology at Kharagpur India (June 1995)

WORK EXPERIENCE (Approx. 2 years.)

Intel Corporation, Santa Clara, CA June 2005 till September 30 2005

- **Designation:** Software Engineering Intern consultant
- Developed GUI and API for multi processor project
- Developed code to interface with driver code through USB
- Prototype implementation using VC++, managed and unmanaged code and .Net

Hitachi Storage Systems Inc., San Jose, CA: June 2004 to October, 2004

- **Designation:** Software Engineering Intern consultant
- Prototype a Solution for disaster recovery in the Ethernet space
- Design of a network traffic analyzer for Hitachi HiPerf toolset by using features of Cisco Catalyst Product, mirror port, and packet capture library, libPcap.
- Project involved extensive programming in C, VC++, Perl and the packet capture library libPcap. Demonstrated proof-of-concept through Perl bindings to rrdtool, tcptrace, and Xplot.

NOKIA Internet Communications, Mountain View, CA: July 2000 to July 2001.

- **Designation:** Routing software development engineer with the Internet Protocol Routing Group
- Design and development of software enhancements for routing protocols RIP, OSPF, PIM.
- Improved routing robustness by modifications to IPSO routing daemon and kernel. Investigated scalability issues.
- Operation and Deployment of routing protocols to develop insight into protocol data exchanges. Investigated conformance to RFC standards.
- Installed BSD/UNIX OS and configured Nokia IP series and Cisco 4000/7500 series routers.

IBM Corporation (Previously Data Beam), Lexington, KY :(August 1998 - Dec 1998)

- **Designation:** Quality Assurance Engineer Intern
Test features of the Online Conference software – Lotus Sametime and NetMeeting.

Tata Electric Companies, Bombay India: June 1995 - May 1996

- **Designation:** System and Software engineer,
Computer maintenance, switching and load dispatch

Research Assistant: (May 1998 - July 1998), Electrical Engineering, University of
(September 2001 - May 2002) Kentucky, Lexington
(September 2002 - Present) Comp. Science, University of California, Riverside
Teaching Assistant: (August 1996 - May 2000) University of Kentucky, Lexington

ACADEMIC PROJECTS (Design and Implementation)

1. Computer Networks:

- Shortest Path Algorithms: Implemented least cost path algorithms, Bellman-Ford and Dijkstra, between source and destination using adjacency list representation of graphs.
- Symmetric communication between peer protocol entities that transmit messages to a multicast address, peers exchange digitally signed messages.
- Tic-Tac-Toe Protocol: allows the game of Tic-Tac-Toe to be played over the Internet by subscribing to a multicast group, responders authenticate and reply to challenge messages, an accounting process keeps account of scores of individual processes in the sessions.
- Design and implementation of fragmentation and reassembly protocol and the forwarding "lookup" function (outgoing interface and next-hop address) similar to IPV4.

2. Computer Security:

- Performance Analysis of Cryptographic tools using Perl modules of Rot13, RC-4, MD5, DES and 3-DES by recording encryption and decryption times of random files of different sizes.
- Complete Implementation of the Secure Remote Password (SRP) in C using GNU GMP for arbitrary precision arithmetic.
- Implemented the Probabilistic Rabin-Miller Primality Testing Algorithm in C.

3. Operating Systems:

- Emulation of a virtual file system that supports sequential and random access, file, inode and directory implementation.
- Distributed Shared Memory using Li-Hudac algorithm. A large number of random integers (8000962) were sorted using the distributed merge sort algorithm.
- Distributed mutual exclusion. An application program interface with an associated library was built to implement distributed mutual exclusion according to Lamport's logical clocks.
- Implementation of system calls: Three system calls were implemented in LINUX.
 - 1) A "Rush" system call for prioritizing the CPU scheduling.
 - 2) A "Pause" system call to context switch user processes for an arbitrary specified time interval.
 - 3) A System call for passing open file descriptors between related processes (parent & child).
- Design of a basic Unix shell. The shell consisted of a **scanner**, a command **parser** and a command interpreter. Implemented basic features like pipes, background commands
- Installation of Gentoo Linux, Samba, Apache, Postfix servers, Globus Grid.

4. Computer Architecture:

- Complete 5-stage pipeline simulation of a RISC processor for a subset of MIPS instructions with interdependency and hazard detection between instructions.
- Design of logic gates, flip-flops and finite state machines using VHDL.
- Minimal set of DLX microprocessor instructions using Xilinx tools, Cache implantations in C.
- Implemented Skull device driver for Linux 2.4.20-8.
- Analysis of openSSL performance on Linux platform on the dual Pentium using SpecWeb (SSL) 99 and oprofile.
- Implementation of Crypto Codes on Intel IXP2400 embedded network processors using Intel SDK micro C and micro code.

Publications (Computer Science and Engineering)

- "Utility Fairness in Link Aggregated Systems", Submitted to **IEEE High Performance Switching and Routing Workshop (HPSR '07)**
- "Lexicographic fairness in WDM interconnects", Accepted in **IEEE Annual Conference on Communications (INFOCOM 2007)**, Anchorage, May 2007
- "Adaptive max-min fair scheduling in Buffered Crossbar switches without speedup", Accepted in **IEEE Annual Conference on Communications (INFOCOM 2007)**, Anchorage, May 2007
- Fair Scheduling over multiple servers with flow dependent server rates", **IEEE Local Computer Networks (LCN 2006)**, Tampa Fl, November 2006
- "Guaranteed Smooth Switch Scheduling with Low Complexity", **IEEE Global Telecommunications Conference (GLOBECOM 2005)**, St. Louis Mo, December 2005
- "On fairness in Link Aggregated Internet Services", 14th **International Conference on Computer Communications and Networks (ICCCN 2005)**, October 2005
- "Fair Scheduling in Link Aggregated Internet Services", submitted to **Computer Networks**, Elsevier
- "Loop Level analysis of security and network applications" Workshop on Computer Architecture Evaluation using Commercial Workloads (CAECW-03) held in Conjunction with **IEEE High Performance Computer Architecture (HPCA-9)**, February 2003.
- 5 other publications in refereed conferences (Electrical Engineering)

Honors

- Certificate of Recognition from Intel Corporation for developing GUI and diagnostic software for advanced platform group.
- University of California Dean's Fellowship

- Best session paper in 2nd International Conference on Cybernetics Information Technologies, Systems and Applications, Orlando FL, July 2005.
- National Talent Search Scholarship (Govt. of India)

Electrical Engineering Masters' topic:

Optimal controller synthesis for a class of discrete event processes

Computer Science Masters' topic:

Lexicographic Fairness in *WDM* Interconnects

Current PhD. Research:

Quality of Service (QoS) Scheduling in Internet Routers and link aggregated systems

References furnished on request.