
Venkatraman Ramakrishna

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Educational Qualifications

- PhD candidate in the [Computer Science Department](#) at [UCLA \(University of California, Los Angeles\)](#) – GPA: 3.85 (*Graduating in August 2008*)
Dissertation Title: Policy Management and Interoperation through Negotiation in Ubiquitous Computing
Advisor: Dr. Peter Reiher (Adjunct Associate Professor, Computer Science Department, UCLA)
Major: Distributed Computing; *Minors:* Computer Networking, Artificial Intelligence
- MS (Master of Science) in Computer Science at UCLA in March 2003 – GPA: 3.864
Project Title: Multiplayer Games in Active Networks
Advisor: Dr. Peter Reiher (Adjunct Associate Professor, Computer Science Department, UCLA)
- Obtained B.Tech. (Bachelor of Technology) with Honours in Computer Science and Engineering from [IIT \(Indian Institute of Technology\), Kharagpur](#), India (May 2001) – Final GPA: 9.07 on a scale of 10

Objective

To seek a full time position in the area of designing software for computer systems and networks. I have a particular interest, and experience, in designing mobile and distributed systems and applications.

Areas of Interest

Mobile and Distributed Computing, Ubiquitous Computing, Service-Oriented Computing, Middleware, Security, Human-Computer Interaction.

Research and Work Experience

Graduate Research Assistant (LASR Research Group, Computer Science Department, UCLA)

- **PhD Thesis:** *Policy Management and Interoperation through Negotiation in Ubiquitous Computing (2004-Present)*—Designed, implemented and demonstrated a working prototype of a policy management framework and negotiation protocol for ubiquitous computing environments. An interaction between mutually unknown (and untrusted) entities in such scenarios is a negotiation, which is effectively a decentralized procedure for policy resolution. Such a negotiation protocol enables secure and flexible service access agreements among entities, is context-aware, and requires only basic networking infrastructure and a common, logic-based, policy language [9].
- **Panoply Ubiquitous Computing Project (2003-present)**—Panoply [4] is a ubiquitous computing framework based on groups of devices, called *spheres of influence*. I have contributed toward the design and implementation of the infrastructure and various applications that use the middleware.
 - *Application:* Team- and location-based interactive narrative deployed in the UCLA campus.
 - *Application:* Smart Party with dynamically customizable music playlists tailored to guests' tastes
- **QED (Quarantine, Examination and Decontamination) Project (2003-04)**—QED [5,7] protects networks from vulnerable and infected devices. Networks, through a cooperative protocol, can verify the security state of prospective clients and patch or disinfect them if necessary.

- Contributed to a **successful NSF funding proposal** for my research group: Panoply project (2004)
- Served on the Program Committee of *CCNC 2008: Track 4: Communications and Information Security*
- **Master of Science Project (2002-03): Multiplayer Games in Active Networks**—Designed and implemented a multicast tree-based packet distribution framework using active networks, to adapt legacy online multiplayer games like DOOM; the tree aggregates and disaggregates packets for efficient routing, and self-adjusts in response to change in network conditions [2,6].
- **Panda Active Networks project (2001-02)**—Provided application-aware adaptation features for the Panda active networks middleware, designed an API for users and applications to interact with the middleware and control the adaptation process, ported a Linux kernel module for TCP interception [1].

Graduate Technical Intern at Intel Corporation, Chandler, AZ (June-September 2004)

Content Inspection Framework for an Intel IXP(2400/2800)-based stateful firewall

- Designed algorithms for string searching (pattern matching); simulated and tested multi-pattern matching algorithms on the IXP Developers Workbench v3.51, the goal being *deep packet inspection* for detection of viruses, worms or intrusion attempts at line speeds. The algorithms searched for patterns spanning multiple packets, and those having associated tags (such as case dependence, offset and depth) as well.
- This work resulted in multiple IDFs (Invention Disclosures), two of which have been patented (indicated above in the “Patents” section).

Teaching Assistant in the UCLA Computer Science Department (Winter 2007)

CS118: Computer Networks—Gave lessons on UNIX socket programming (C/C++) and provided guidance in designing and implementing network protocols and basic client/server applications.

Undergraduate Achievements (IIT Kharagpur, India, 1997-2001)

- **Senior Year Research Project (2000-2001), towards Bachelor of Technology degree: Minimizing switching activity in embedded systems using intelligent instruction coding mechanisms** –We designed an instruction coding mechanism for embedded processors that combined Huffman coding and bit padding, and compared its performance against Gray encoding and simple binary encoding [3].
- *Member of the Organizing Committee* for the 1st Bitwise Annual Algorithm Intensive Online Programming Contest (2001): organized by undergraduate seniors at IIT Kharagpur, India.

Summer Intern at Aditi Technologies, Bangalore, India (May-June 2000)

Designed and implemented a trainee evaluation system for the company using SQL and ASP; the system collected feedback over the web, collated it in a database and selected relevant information for further processing in an automated fashion.

Publications

- [1] Vincent Ferreria, Alexey Rudenko, Kevin Eustice, Richard Guy, **V. Ramakrishna**, and Peter Reiher, “Panda: Middleware to Provide the Benefits of Active Networks to Legacy Applications,” *DANCE 02*, May 2002.
- [2] **V. Ramakrishna**, Max Robinson, Kevin Eustice and Peter Reiher, “An Active Self-Optimizing Multiplayer Gaming Architecture,” In the Proceedings of the *Fifth Annual International Workshop on Active Middleware Services (AMS 2003)*, 25 June 2003 in Seattle, Washington.
- [3] **V. Ramakrishna**, Rakesh Kumar and Anupam Basu, “Switching Activity Minimization by Efficient Instruction Set Architecture Design,” In the Proceedings of the 45th *IEEE International Midwest Symposium on Circuits and Systems (MWSCAS2002)*, August 4-7, 2002 in Tulsa, Oklahoma.
- [4] Kevin Eustice, Leonard Kleinrock, Shane Markstrum, Gerald Popek, **Venkatraman Ramakrishna**, Peter Reiher, “Enabling Secure Ubiquitous Interactions,” In the Proceedings of the *1st International Workshop on Middleware for Pervasive and Ad-Hoc Computing (Co-located with Middleware 2003)*, 17 June 2003 in Rio de Janeiro, Brazil.

- [5] Kevin Eustice, Leonard Kleinrock, Shane Markstrum, Gerald Popek, **Venkatraman Ramakrishna**, Peter Reiher, "Wi-Fi Nomads: The Case for Quarantine, Examination and Decontamination," In the Proceedings of the *New Security Paradigms Workshop 2003*, August 2003 in Ascona, Switzerland.
- [6] **V. Ramakrishna**, Max Robinson, Kevin Eustice and Peter Reiher, "An Active Self-Optimizing Multiplayer Gaming Architecture," In the *Cluster Computing Journal*, Publisher: Springer Netherlands, Issue: Volume 9, Number 2, "Special Issue: *Autonomic Computing*," Guest Editor: Manish Parashar, pp. 201-215.
- [7] Kevin Eustice, Leonard Kleinrock, Shane Markstrum, Gerald Popek, **Venkatraman Ramakrishna**, Peter Reiher, "QED: Securing the Mobile Masses," *UCLA Computer Science Department Technical Report #TR050042*, October 2005.
- [8] **V. Ramakrishna**, Kevin Eustice and Matthew Schnaider, "Approaches for Ensuring Security and Privacy in Unplanned Ubiquitous Computing Interactions," In the Proceedings of the *International Workshop on Research Challenges in Security and Privacy for Mobile and Wireless Networks (WSPWN06)*, March 15-16, 2006, Miami.
- [9] **V. Ramakrishna**, Kevin Eustice, and Peter Reiher, "Negotiating Agreements Using Policies in Ubiquitous Computing Scenarios," In the Proceedings of the *IEEE International Conference on Service-Oriented Computing and Applications (SOCA'07)*, June 19-20, 2007, Newport Beach, California.
- [10] Kevin Eustice, **V. Ramakrishna**, Alison Walker, Matthew Schnaider, Nam Nguyen and Peter Reiher, "nan0sphere: Location-Driven Fiction for Groups of Users," In the Proceedings of the *12th International Conference on Human-Computer Interaction (HCII 2007)*, 22-27 July 2007, Beijing, P.R.China.
- [11] **V. Ramakrishna**, Kevin Eustice and Matthew Schnaider, "Chapter 8: Approaches for Ensuring Security and Privacy in Unplanned Ubiquitous Computing Interactions," *Mobile and Wireless Networks Security and Privacy*," Edited Volume by Springer Science+Business Media, LLC, Ed: Makki et. al. 2007.
- [12] Peter Reiher, Kevin Eustice, and **V. Ramakrishna**, "Chapter: Security and Privacy in Pervasive Computing," *Security and Privacy in Mobile and Wireless Networking*, Troubadour Publishing, by Stefanos Gritzalis, Tom Karygiannis and Charalabos Skianis (editors), ISBN: 978-1905886-906.
- [13] Kevin Eustice, **V. Ramakrishna**, Nam Nguyen, and Peter Reiher, "The Smart Party: A Personalized Location-aware Multimedia Experience," In the Proceedings of the *Fifth IEEE Consumer Communications and Networking Conference (CCNC 2008)*, Las Vegas, NV, January 10-12, 2008.

Patents

- [1] US Patent Application 20070011734: Santosh Balakrishnan and Venkatraman Ramakrishna, "Stateful Packet Content Matching Mechanisms".
- [2] US Patent Application 20070006293: Santosh Balakrishnan and Venkatraman Ramakrishna, "Multi-Pattern Packet Content Inspection Mechanisms Employing Tagged Values".

Presentations

- [1] An Active Self-Optimizing Multiplayer Gaming Architecture.
At the *5th Annual International Workshop on Active Middleware Services (AMS 2003)*, 25th June 2003, Seattle, WA.
- [2] Securing Nomads: The Case For Quarantine, Examination, Decontamination.
At the *19th Annual Computer Security Applications Conference (ACSAC 2003)*, 11th December 2003, Las Vegas, NV.
- [3] Approaches for Ensuring Security and Privacy in Unplanned Ubiquitous Computing Interactions.
At the *International Workshop on Research Challenges in Security and Privacy for Mobile and Wireless Networks (WSPWN06)*, 15th March 2006, Miami.
- [4] Negotiating Agreements Using Policies in Ubiquitous Computing Scenarios.
At the *IEEE International Conference on Service-Oriented Computing and Applications (SOCA'07)*, 20th June 2007, Newport Beach, CA.
- [5] nan0sphere: Location-Driven Fiction for Groups of Users.
At the *12th International Conference on Human-Computer Interaction (HCII 2007)*, 26th July 2007, Beijing, P.R.China.

Awards and Honors

- Chorafas Foundation scholarship (2006)
- NTSE (National Talent Search Examination) scholarship awarded by the Govt. of India (1996)
- Hitachi Telco scholarship (1998)

Skills and Experiences

- **Languages:** General Purpose (C, C++, Java); Functional and Logic Programming (Scheme, Prolog); Query Languages (MS-SQL); HTML, JavaScript; Intel IXP microcode.
- Experience working with development tools such as Eclipse, MS Visual Studio, ANTS active networks package, NS-2, MPI, Lex and Yacc, Intel IXP (2400/2800) Developers Workbench.
- Worked with, and augmented, the DHCP (Dynamic Host Configuration Protocol) source code (ISC-DHCP); Worked with the SWI-Prolog project and provided source code patches.
- **Operating Systems/Platforms:** Linux, UNIX (Solaris, Digital UNIX), Windows.
- Practical experience in network (socket and client-server) programming, Linux kernel programming.