

Holly M. Esquivel

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RESEARCH INTERESTS

Internet Economics and Routing Protocols, Spam Filtration Mechanisms, and Computer

EDUCATION

University of Wisconsin – Madison **Madison, WI**

Ph. D in Computer Sciences

Expected Graduation: May 2012

- 3.69 GPA
- Masters in Computer Sciences, Degree Awarded May 2009
- **Selected Coursework:** Introduction to Computer Networks, Introduction to Computer Security, Analysis of Software Artifacts, Advanced Computer Networks, Building Fast Networks, Rethinking the Internet Architecture

University of Nebraska at Kearney **Kearney, NE**

Bachelors of Science in Computer Science Comprehensive

Degree Awarded, Summa Cum Laude, University Honors Program Completed, May 2007

- 3.918 GPA in Major, 3.936 overall

Iowa State University **Ames, IA**

National Student Exchange Participant Spring 2006

- 4.00 GPA in Major, 4.00 overall

PROFESSIONAL EXPERIENCE

May 2008 – August 2008 IBM Rochester Support Center Rochester, MN

Speed Team Software Engineer

- Architected and implemented a GUI flowchart creation system
- Interfaced the system with an existing DB2 database
- Configured PHP and Apache on Red Hat Enterprise Linux 5.2

January 2006 – May 2006 Iowa State University Ames, IA

Java Applet Programmer

- Programmed interactive science based java applets

RESEARCH EXPERIENCE

February 2008 – Present *Internet Economics and Routing Protocols, and Spam Filtration Mechanisms*

Graduate Research Assistant, University of Wisconsin – Madison

- Internet Economics – Developed a Java/C++ simulator, which emulated an Internet routing protocol driven by selfish users and ISPs seeking to receive a specified quality of service. Implemented naïve and semi-sophisticated learning algorithms into the behavior of ISPs to allow ISPs to adjust link pricing to maximize profit. Implemented both a centralized, and a distributed version of the application, that would be a practical set-up for implementation. Collected and analyzed numerous data sets in the simulator based

on varying topologies, learning algorithms and pricing techniques. Compared results to previously published theory results to show that a selfish environment does not always result in high price of anarchy.

- Spam Filtration Mechanisms – Designed a router-level filtration mechanism based on the TCP header of the original message from the e-mail sending host. Analyzed several months worth of TCP header information to gather statistics on e-mail that was classified as spam by SpamAssassin. Analysis shows that only a small number of fingerprints are required to eliminate a significant percentage of spam e-mails. These fingerprints also have a relatively low number of legitimate misclassified e-mails.

August 2006 – May 2007 *Automated RSA Number Factorization via Screensavers*

Undergraduate Researcher, University of Nebraska at Kearney

- Researched RSA number factorization algorithms. Designed and implemented factorization screensaver locally on a group of research computers. Collected empirical results of factorization's performance, and prepared and analyzed results for publication of numbers up to 150 binary bits.

June 2006 – August 2006 *A Visualization Tool for Web Application Testing*

Undergraduate Researcher, University of Delaware

- Designed and implemented, WebVizOr, an open-source tool developed to enable visualization and comparative analysis of test results from web applications with an embedded framework for utilizing any of a set of available test oracles.
- Designed and implemented new/improved oracle comparators to filter and detect various types of differences between test results from web applications.

CONFERENCE PUBLICATIONS

H. Esquivel, T. Mori and A. Akella, "The Effectiveness of IP Reputation for Spam Filtering," Second International Conference on Communication Systems and Networks (COMSNETS), January 2010, to appear.

H. Esquivel, T. Mori, and A. Akella, "Router-Level Spam Filtering Using TCP Fingerprints: Architecture and Measurement-Based Evaluation," Sixth Conference on Email and Anti-Spam (CEAS), July 2009.

S. Sprenkle, H. Esquivel, B. Hazelwood, and L. Pollock. "WebVizOr: A Visualization Tool for Applying Automated Oracles and Analyzing Test Results of Web Applications," Testing: Academic and Industry Conference Practice and Research Techniques (TAIC-PART), IEEE, August 2008.

S. Sprenkle, L. Pollock, H. Esquivel, B. Hazelwood, and S. Ecott, "Automated Oracle Comparators for Testing Web Applications," 18th IEEE International Symposium on Software Reliability Engineering, IEEE, November 2007.

TECHNICAL REPORTS

T. Mori, H. Esquivel, A. Akella, A. Shimoda and S. Goto, "Understanding the World's Worst Spamming Botnet," Univ. of WI-Madison-Technical Report 1660, June 2009.

H. Esquivel, C. Muthukrishnan, F. Niu, A. Akella, and S. Chawla, "RouteBazaar: An Economic Framework for Flexible Routing," Univ. of WI-Madison-Technical Report 1654, April 2009.

T. Mori, H. Esquivel, A. Akella, Z. M. Mao, Y. Xie, F. Yu, "On the Effectiveness of Pre-Acceptance Spam Filtering," Univ. of WI-Madison-Technical Report 1650, February 2009.

S. Sprenkle, H. Esquivel, B. Hazelwood, and L. Pollock, "WebVizOr: A Fault Detection Visualization Tool for Web Applications," Univ. of DE-Technical Report 206-335, April 2007.

POSTER PRESENTATIONS

B. Hazelwood, H. Esquivel, S. Sprenkle and L. Pollock, "WebVizOr: A Fault Detection Visualization Tool for Web Applications," Midwest Women in Computing Conference (MidWIC), Greencastle, Indiana, September 2006.

ORAL PRESENTATIONS

"Tracking Session Variables in Web Applications," H. Esquivel, University of Wisconsin – Madison Computer Science 706 Project Presentation, Madison, WI, December 2007.

"Utilizing Idle CPU Usage in an Automated Fashion for RSA Number Factorization," H. Esquivel, H. Ngondo, and T. May, National Conference on Undergraduate Research (NCUR) 2007, San Rafeal, CA, April 2007.

"Utilizing Idle CPU Usage in an Automated Fashion for RSA Decryption." H. Esquivel. Computer Science Parallel Talks at University of Nebraska-Lincoln Regional Workshop in Mathematical Sciences, Lincoln, NE, October 2006.

TEACHING

January 2009 – May 2009 University of Wisconsin-Madison Madison, WI

Lecturer *Introduction to Programming (CS302)*

- Developed lectures and take home exercises for guided practice
- Demonstrated competency in working with students with diverse needs
- Collaborated with peers to meet departmental goals

Fall 2005 University of Nebraska at Kearney Kearney, NE

Student Peer Leader *Introduction to Computer Science (CSIS 130)*

- Assisted students with computer science assignments
- Planned required social activities for students outside of course
- Helped first year undergraduate students assimilate into college life

HONORS AND AWARDS

National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2008-2011.

Google Travel Grant Recipient, CEAS 2009.

Advanced Opportunity Fellowship, University of Wisconsin – Madison, 2007 – 2008.

CRA Outstanding Undergraduate Award – Honorable Mention, Computing Research Association, 2007.

Computer Science Fellow, Department of Computer Science and Information Systems, University of Nebraska at Kearney, August 2006 – May 2007.

Robert Rosenlof Honors Scholar, University of Nebraska at Kearney, August 2006 – May 2007.

Regent Scholar, scholarship awarded by University of Nebraska at Kearney, 2003-2007.

Distributed Mentor Project Participant, University of Delaware, research under Dr. Lori Pollock funded by CRA-W, 2006.

Dean's List, University of Nebraska at Kearney, 2003-2007.

Dean's List, Iowa State University, Spring 2006.

Phi Kappa Phi, National Honor Society, University of Nebraska at Kearney, inducted in 2005.

Phi Eta Sigma, University of Nebraska at Kearney, inducted in 2004.

SERVICE AND PROFESSIONAL ACTIVITIES

Chair & Co-Chair, UW - Madison Computer Sciences Welcome Weekend for Prospective Graduate Students, 2009 & 2008.

Chapter President, UW - Madison Women's Association for Computing Machinery (WACM), University of Wisconsin – Madison, 2007 - 2009.

Member, UW - Madison Student Association for Computing Machinery (SACM), University of Wisconsin – Madison, 2007 - 2009.

Coffee Czar, UW - Madison Computer Sciences SACM, University of Wisconsin-Madison, 2009.

National Member, ACM, 2005 – 2009.

Chapter President, Association for Computing Machinery (ACM), University of Nebraska at Kearney, 2005 – 2007.

Member, American Association for Artificial Intelligence, 2006 – 2007.

Mentor for high school students, UNK Information Technology Forum, November 2006.

TECHNICAL QUALIFICATIONS

- **Languages:** Java, Ruby, C++, C, Adobe Flex, ActionScript, JSPs, MySQL, HTML, CSS
- **Software:** Eclipse, LaTeX, Microsoft Word, Excel and Access
- **Operating Systems:** Windows XP, Red Hat Linux 5, Ubuntu