Raluca Musăloiu-Elefteri

CONTACT INFORMATION

Johns Hopkins University
3400 N. Charles Street
313 New Engineering Building
Baltimore, MD 21218

Phone: 410-366-2179
E-mail: ralucam@cs.jhu.edu
Web: http://cs.jhu.edu/~ralucam
http://raluca.musaloiu.com

INTERESTS

My general interest lies in Wireless Mesh Networks, Networks and Distributed Systems. I enjoy designing and building real systems related, but not limited to any of these areas.

EDUCATION

Johns Hopkins University, Baltimore, MD — **September 2004 - now**
Department of Computer Science

Ph.D. Candidate, Computer Science
Thesis: *Practical Wireless Mesh Networks and Their Applications*
Advisor: Prof. Yair Amir

M.S.E., Computer Science — 2006
Qualifying project: *Fast Handoff for Wireless Mesh Networks*

Politehnica University of Bucharest, Romania — **October 1998 - June 2004**
Faculty of Automatic Control and Computers

M.S., Computer Science — June 2004
Concentration: *Advanced Systems for Internet Applications*
GPA: 10 on a 1 to 10 scale

B.S., Computer Science — September 2003
Thesis: *Refinement of Chart Patterns in CPL*
Advisors: Prof. Nicolae Țăpuș and Prof. Siau Cheng Khoo
GPA: 9.68 on a 1 to 10 scale

ACADEMIC EXPERIENCE

The Johns Hopkins University, Baltimore, MD — **now**
Research Assistant
Distributed Systems and Networks Lab

Intra and Inter-domain Handoff for Wireless Mesh Networks

Designed and implemented protocols to support intra-domain and inter-domain handoff in wireless mesh networks, with real-time performance. This resulted in the first system where mobile clients can connect and freely roam throughout the network without losing the connectivity when switching between the access points. The system does not require any software modification of the clients, relying solely on coordination protocols between access points. The system is currently deployed over three buildings at the Johns Hopkins University. The project also involved hands-on work with various embedded devices such as Linksys, Ligowave, ADI Engineering, Meraki routers.

Robust Push-to-Talk Service

Designed and implemented a robust Push-to-Talk (PTT) service for wireless mesh networks, suitable for first responders. The protocol makes PTT service highly available and resilient to mesh connectivity changes such as network partitions and merges. The system seamlessly integrates with regular cell phones.

Redundant Multipath Operating System Support

Designed and implemented a kernel routing scheme to achieve high reliability with high throughput in a mesh system, using off-the-shelf wireless routers. While the focus was on wireless mesh networks, the mechanism is generic and can be used in other networks. The kernel modules are available for download.

National University of Singapore **February - August 2003**
Research Intern
Programming Languages and Systems Lab

This research constitutes my thesis for the B.S. degree awarded by Politehnica University of Bucharest. The project consisted of algorithms for optimizing chart patterns defined in a domain specific language. I developed it in Haskell.

Professional Experience

Google Inc., Mountain View, CA **June - August 2008**
Software Engineer Intern
Google Front-End Infrastructure Team

I worked on reducing the latency of client connections for static content, transparently, from the front-end infrastructure. The project involved preliminary investigation, implementation, and evaluation of its effectiveness using live traffic.

Cisco Academy, Politehnica University of Bucharest **October 2001 - February 2003**
Instructor
Cisco Networking Academy Program

I provided hands-on and theoretical training for CCNA (Cisco Certified Network Associate) exam.

Teaching Experience

Johns Hopkins University, Baltimore, MD
Instructor

Advanced Distributed Systems and Networks Fall 2008
Co-taught an advanced course, managed as a discussion group focused around selected research topics. The projects consisted in implementing a 3G/Wi-Fi handoff for smartphones and enabling Bluetooth devices to be discovered and communicate over the Internet.

Teaching Assistant

Compilers and Interpreters	Spring 2006, Spring 2007
Intermediate Programming	Fall 2006
Unix System Programming	Fall 2004

Duties included office hours, grading assignments and occasional presentations.

Politehnica University of Bucharest, Romania
Teaching Assistant

Artificial Intelligence	Spring 2004
Functional Programming	Spring 2004
Data Structures and Algorithms	Spring 2004
Algorithms Analysis	Fall 2003
Operating Systems	Fall 2002

Duties included weekly laboratory presentations, designing and grading assignments and exams.

Publications

A Robust Push-to-Talk Service for Wireless Mesh Networks.
Yair Amir, Raluca Musăloiu-Elefteri, Nilo Rivera.
In submission.

On Redundant Multipath Operating System Support for Wireless Mesh Networks.
Yair Amir, Claudiu Danilov, Michael A. Kaplan, Raluca Musăloiu-Elefteri, Nilo Rivera.
In Proceedings of the Third IEEE Workshop on Wireless Mesh Networks (WiMesh 2008), San Francisco, California, June 2008.

Gateway Design for Data Gathering Sensor Networks.
Raluca Musăloiu-E., Răzvan Musăloiu-E., Andreas Terzis.
In Proceedings of the Fifth Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON 2008), San Francisco, California, June 2008.

An Inter-domain Routing Protocol for Multi-homed Wireless Mesh Networks.
Yair Amir, Claudiu Danilov, Raluca Musăloiu-Elefteri, Nilo Rivera.
In Proceedings of the IEEE Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2007). Accepted as an extended paper, Helsinki, Finland, June 2007.

Fast Handoff for Seamless Wireless Mesh Networks.
Yair Amir, Claudiu Danilov, Michael Hilsdale, Raluca Musăloiu-Elefteri, Nilo Rivera.
In Proceedings of the International Conference on Mobile Systems Applications and Services (MobiSys 2006), Uppsala, Sweden, June 2006.

Proiectarea și administrarea rețelelor locale de calculatoare. (book)
Răzvan Rughiniș, Octavian Purdilă, Raluca Musăloiu, Răzvan Musăloiu.
Ed. Printech, 2004. Title's translation: *Design and Administration of Local Area Networks*.

Rețele locale de calculatore. Ghid de laborator. (book)
Cătălina Lehănceanu, Cristian Orban, Octavian Purdilă, Răzvan Rughiniș.
Ed. Printech, 2003. Title's translation: *Local Area Networks. Laboratory Guide.*
I co-authored the TCP/IP chapter of the book.

Technical Reports

The SMesh Wireless Mesh Network.
Yair Amir, Claudiu Danilov, Raluca Musăloiu-Elefteri, Nilo Rivera.
Technical Report, CNDS-2009-3, April 2009.

Talks

Gateway Design for Data Gathering Sensor Networks.
SECON 2008, San Francisco, California, June 2008.

On Redundant Multipath Operating System Support for Wireless Mesh Networks.
WiMesh 2008, San Francisco, California, June 2008.

An Inter-domain Routing Protocol for Multi-homed Wireless Mesh Networks.
WoWMoM 2007, Helsinki, Finland, June 2007.

Released Software

The SMesh Wireless Mesh Network (www.smesh.org)
Yair Amir, Claudiu Danilov, Raluca Musăloiu-Elefteri, Nilo Rivera.

I am one of the creators of the SMesh system, a completely transparent wireless mesh network with fast-handoff. It allows wireless mobile clients to freely roam within an area covered by several access points (not all connected to the Internet) while maintaining their connections at all times, with no interruption in service. SMesh runs solely on the access points, which coordinate and provide instantaneous handoff to any 802.11 wireless devices without the need of any specific software or drivers on the mobile clients.

Honors and Awards

Student Travel Award for IEEE WoWMoM 2007, by NFS, IEEE TCCC, and IBM.

Romanian Ministry of Education Scholarship for Academic Performance, 1998 - 2004.

Graduated in 9^{th} place from the Computer Science and Engineering Department (about 250 graduating students), 2003.

1^{st} place at the WDG Florida Challenge, programming contest, 2001.

1^{st} place at the Fall USACO (USA Computing Olympiad) Tournament, programming contest, 1998.

8^{th} place at the Spring USACO Tournament, programming contest, 1998.

Mention at the Romanian National Olympiad of Informatics, 1998.

9^{th} place at LEGO - International Programming Contest (about 200 participants), Oradea, Romania, 1998.

One of the 10 finalists at Compaq Cup (PCWorld Romania programming contest), December, 1997.

Memberships

IEEE member, since January 2003.