Cristian Lumezanu

Curriculum Vitae

A.V. Williams Building, #3122
University of Maryland
College Park, MD 20742

email: lume@cs.umd.edu
phone: 240-486-9637
web: `http://www.cs.umd.edu/~lume`

EDUCATION

University of Maryland, College Park, MD

Ph.D., Computer Science — Expected September 2009
Advisor: Neil Spring
Thesis: Using Internet Geometry to Improve End-to-end Communication

M.S., Computer Science — May 2006

Politehnica University, Bucharest, Romania

M.S., Computer Science — July 2003

B.S., Computer Science — June 2002

RESEARCH INTERESTS

Networking and distributed systems, with emphasis on designing, building and analyzing systems that enhance the functionality of the Internet.

RESEARCH EXPERIENCE

University of Maryland, College Park, MD — June 2004 - present

PeerWise Overlay Networks
Designed and built PeerWise, a latency-reducing routing overlay network that uses the geometry of the Internet latency space to make end-to-end communication fast, fair and scalable. PeerWise is based on three principles: that triangle inequality violations in the Internet reveal shorter paths between users, that overlay edges should be based on mutual advantage, and that the embedding error of network coordinates scalably exposes shorter-than-default "detour" routes.

Decentralized Message Ordering
Developed and evaluated OverSeq, a scalable and practical algorithm to enforce ordered delivery of messages to groups of nodes in a distributed system.

Static Analysis of Network Protocol Implementations
Contributed to Pistachio, a tool that detects vulnerabilities in network protocol implementations using a rule-based specification derived from natural language documents such as RFCs. Pistachio started as a class assignment and developed into a full-fledged project.

Detecting and Redirecting Relayed Skype Traffic
Built DRS, a tool that detects and redirects relayed Skype connections that originate and end on the same side of the boundary of an enterprise. DRS uses packet matching and needs to see only one relayed voice packet before short-circuiting the connection.

Distributed Software Quality Assurance
Implemented and deployed the MS Windows client of Skoll, a distributed, automated, feedback-driven tool which performs around-the-world, around-the-clock software QA tasks.

Scalable Application Layer Multicast
Evaluated the NICE application-layer multicast protocol and compared it with the Scribe multicast; experiments consisted of data path and control overhead measurements on the PlanetLab testbed.

Alcatel-Lucent Bell Laboratories, Murray Hill, NJ Summer 2009

Architecture for Cellular Wireless Network Acceleration
Designing and building an architecture to eliminate redundant traffic in cellular wireless networks. The architecture improves bandwidth and access speed of mobile users using three complementary techniques: fingerprint-based encoding of repeated content, generic push notification service and personalized mobile web caching.

IBM T.J. Watson Research Center, Hawthorne, NY Summer 2005, Summer 2006

Distributed Optimization for Information Dissemination Applications
Designed and implemented LRGP and LLA, two distributed algorithms that optimize the overall benefit while keeping the resources uncongested in information dissemination applications. LRGP applies to publish/subscribe-type applications where the benefit increases with the number of consumers and the data delivery rate. LLA is intended for applications with diverse real-time requirements where it is important that data be delivered to the destination before predetermined deadlines.

PUBLICATIONS

(all publications are available at `http://www.cs.umd.edu/~lume`)

Refereed Publications

1 Triangle Inequality Variations in the Internet
Cristian Lumezanu, Randy Baden, Neil Spring, Bobby Bhattacharjee
IMC *(Internet Measurement Conference), 2009*
(22% acceptance)

2 Symbiotic Relationships in Internet Routing Overlays
Cristian Lumezanu, Randy Baden, Dave Levin, Neil Spring, Bobby Bhattacharjee
NSDI *(Symposium on Networked Systems Design and Implementation), 2009*
(19% acceptance)

3 Triangle Inequality and Routing Policy Violations in the Internet
Cristian Lumezanu, Randy Baden, Neil Spring, Bobby Bhattacharjee
PAM *(Passive and Active Measurement Conference), 2009*
(29% acceptance)

4 Motivating Participation in Internet Routing Overlays
Dave Levin, Randy Baden, **Cristian Lumezanu**, Neil Spring, Bobby Bhattacharjee
NetEcon *(Workshop on the Economics of Networks, Systems, and Computation), 2008*
(54% acceptance)

5 Online Optimization for Latency Assignment in Distributed Real-Time Systems
Cristian Lumezanu, Sumeer Bhola, Mark Astley
ICDCS *(International Conference on Distributed Computing Systems), 2008*
(16% acceptance)

6 Measurement Manipulation and Space Selection in Network Coordinates
Cristian Lumezanu, Neil Spring
ICDCS *(International Conference on Distributed Computing Systems), 2008*
(16% acceptance)

7 Rule-Based Static Analysis of Network Protocol Implementations
Octavian Udrea, **Cristian Lumezanu**, Jeffrey S. Foster
Journal of Information and Computation*, Special Issue on Foundations and Automated Reasoning, volume 206, issues 2-4, 2008*

8 PeerWise Discovery and Negotiation of Faster Paths
Cristian Lumezanu, Dave Levin, Neil Spring
HotNets *(Workshop on Hot Topics in Networking), 2007*
(18% acceptance)

9 Boycotting and Extorting Nodes in an Internetwork

Dave Levin, Adam Bender, **Cristian Lumezanu**, Neil Spring, Bobby Bhattacharjee
NetEcon+IBC *(Workshop on the Economics of Networked Systems and Incentive-Based Computing), 2007*
(50% acceptance)

10 Decentralized Message Ordering for Publish/Subscribe Systems
Cristian Lumezanu, Neil Spring, Bobby Bhattacharjee
Middleware *(International Middleware Conference), 2006*
(17% acceptance)

11 Rule-Based Static Analysis of Network Protocol Implementations
Octavian Udrea, **Cristian Lumezanu**, Jeffrey S. Foster
Usenix Security*, 2006*
(12% acceptance)

12 Utility Optimization for Event-Driven Distributed Infrastructures
Cristian Lumezanu, Sumeer Bhola, Mark Astley
ICDCS *(International Conference on Distributed Computing Systems), 2006*
(14% acceptance)

Technical Reports

13 Online Optimization for Latency Assignment in Distributed Real-Time Systems
Cristian Lumezanu, Sumeer Bhola, Mark Astley
IBM Research Report 24503, IBM TJ Watson Research Center, 2008

14 Playing Vivaldi in Hyperbolic Space
Cristian Lumezanu, Neil Spring
CS-TR-4843, University of Maryland, College Park, 2006

Under Submission

15 PeerWise: Symbiotic Relationships in Internet Routing Overlays
Cristian Lumezanu, Randy Baden, Dave Levin, Neil Spring, Bobby Bhattacharjee
under submission to ***Transactions on Networking***

16 Don't Love Thy Nearest Neighbor
Cristian Lumezanu, Dave Levin, Bo Han, Neil Spring, Bobby Bhattacharjee
under submission

17 Scalable Application Layer Multicast
Suman Banerjee, Bobby Bhattacharjee, Christopher Kommareddy, **Cristian Lumezanu**
under submission to ***Transactions on Networking***

TALKS AND PRESENTATIONS

Using Internet Geometry to Improve End-to-End Communication
Invited talk, Georgia Tech, Atlanta, GA, June 2009

Symbiotic Relationships in Internet Routing Overlays
Conference talk, NSDI, Boston, MA, April 2009

Triangle Inequality and Routing Policy Violations in the Internet
Conference talk, PAM, Seoul, Korea, April 2009

Measurement Manipulation and Node Selection in Network Coordinates
Conference talk, ICDCS, Beijing, China, June 2008

PeerWise Discovery and Negotiation of Faster Paths
Conference talk, HotNets, Atlanta, GA, November 2007

Decentralized Message Ordering for Publish/Subscribe Systems
Conference talk, Middleware, Melbourne, Australia, December 2006

Online Optimization for Latency Assignment in Distributed Real-Time Systems
Invited talk, IBM T.J. Watson Research Center, Hawthorne, NY, August 2006

Utility Optimization for Event-Driven Distributed Infrastructures

Conference talk, ICDCS, Lisbon, Portugal, July 2006

Utility Optimization for Event-Driven Distributed Infrastructures
Invited talk, IBM T.J. Watson Research Center, Hawthorne, NY, August 2005

TEACHING EXPERIENCE

Teaching Assistant 2002 - 2007
University of Maryland

Computer Networks (CMSC 711), Spring 2007
Helped Professor Neil Spring prepare and teach the graduate Computer Networks class. I taught two lectures focusing on network coordinate systems.

Computer Science II (CMSC 214), Fall 2003, Spring 2004
Held recitations two times a week. I helped Instructors Bunny Tjaden and James Marbury prepare and grade homework and projects. The course aimed to introduce CS majors to advanced C/C++ programming concepts.

Politehnica University Bucharest

Communication Protocols, Spring 2002
Assisted Professor Valentin Cristea with the Communication Protocols course. My duties included holding recitations two times per week, grading weekly projects as well as the final exam. The course focused on introductory computer networks concepts.

Instructor March 2001 - July 2002
Politehnica University Bucharest

Cisco Networking Academy Program
Taught the CCNA curriculum to classes of 15-20 students. The course covered the basic foundations of networking and taught students how to install, configure and operate networks. It integrated face-to-face teaching with hands-on lab exercises and realistic network simulations.

PATENTS

Distributed online optimization for latency assignment and slicing
Cristian Lumezanu, Sumeer Bhola, Mark Astley
United States Patent 20090178047, 2009/07/09

System and method for distributed utility optimization in a messaging infrastructure
Cristian Lumezanu, Sumeer Bhola, Mark Astley
United States Patent 20080016217, 2008/01/17

AWARDS

Department Fellowship 2003 - 2005
Department of Computer Science, University of Maryland, College Park

Honorary Award for Outstanding Academic Results 2002
Politehnica University, Bucharest, Romania

Merit-based Fellowship 1997 - 2002
Politehnica University, Bucharest, Romania

ACTIVITIES

Organizer 2005-2009
Syschat, University of Maryland Systems Reading Group

External reviewer

IPTPS 2005, Infocom 2005, NSDI 2006, HiPC 2006, IMC 2006, WORLDS 2006, Sigmetrics 2006, Sigmetrics 2007, ICNP 2007, Sigmetrics 2008, IMC 2008, Infocom 2009, Sigmetrics 2009

MISCELLANEOUS

Citizenship: Romanian
Visa Status: F1

REFERENCES

Prof. Neil Spring
Department of Computer Science
University of Maryland
College Park, MD 20742
nspring@cs.umd.edu
+1-301-405-2909

Prof. Bobby Bhattacharjee
Department of Computer Science
University of Maryland
College Park, MD 20742
bobby@cs.umd.edu
+1-301-405-1658

Prof. Jeff Foster
Department of Computer Science
University of Maryland
College Park, MD 20742
jfoster@cs.umd.edu
+1-301-405-2751

Dr. Sumeer Bhola
Google
76 Ninth Avenue
New York, NY 10011
sbhola@google.com
+1-212-565-9277