

Vytautas “Valas” Valancius

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Research Interests

My area of research is computer networks with a focus on the inter-domain routing protocols and economics. I'm analyzing how efficient the Internet business model is and what are possible alternatives to it using large scale simulation and modeling. I also seek to understand how emerging technologies, such as network virtualization, can help change the existing environment.

Education

Ph.D. Computer Science, Georgia Institute of Technology, 2011 (Expected)

- SamNunn Fellow 2008. Funded by MacArthur Foundation.
- Internship at Thomson Research. Paris, France.
- Internship at Tokyo University, Tokyo, Japan

M.S. Internetworking, Royal Institute of Technology - KTH (Sweden), 2006

- Top (#1) graduate in class of ≈ 100
- Leader for the semester-long ICT4T project in Tanzania.

B.S. Software Engineering, Vilnius University, 2003

- Cygate/Cisco Network Academy Scholarship, 1999-2003
- Thesis: *SIP and H.323 performance in large VoIP networks*

Industry Certifications

- CCIE#14359, CCNP, CCNA, CCDA and MS-CNP.

Self-funded 100% of education since high school through scholarships, full-time and part-time work.

Refereed Publications

Vytautas Valancius, Nick Feamster, Jennifer Rexford, and Akihiro Nakao. “Wide-Area Route Control for Distributed Services”. USENIX ATC, Boston, MA, June 2010.

Vytautas Valancius, Laurent Massoulié, Nikolaos Laoutaris, Christophe Diot and Pablo Rodriguez. “Greening the Internet with Nano Data Centers”. CoNEXT’09, Rome, Italy, December 2009.

Vytautas Valancius, Nick Feamster, Ramesh Johari and Vijay Vazirani. “MINT: A Market for INternet Transit”, Re-Arch’08, New York, NY, December 2008.

Sapan Bhatia, Murtaza Motiwala, Wolfgang Muhlbauer, Yogesh Mundada, Vytautas Valancius, Andy Bavier, Nick Feamster, Larry Peterson and Jennifer Rexford. “Trellis: A Platform for Building Flexible, Fast Virtual Networks on Commodity Hardware”. ROADS, Madrid, Spain, December 2008.

Mukarram Tariq, Amgad Zeitoun, Vytautas Valancius, Nick Feamster, Mostafa Ammar. “Answering ‘What-If’ Deployment and Configuration Questions with WISE”. SIGCOMM, Seattle, WA, August 2008.

Vytautas Valancius and Nick Feamster. “Multiplexing BGP Sessions with BGP-Mux”. CoNEXT, New York, NY December 2007.

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Technical Reports

Vytautas Valancius, Srikanth Sundaresan, Umayr Hassan, Nick Feamster, Ramesh Johari and Vijay Vazirani. “Towards an Internet Connectivity Market”. Georgia Tech, Tech report: GT-CS-09-01, February 2009

Vytautas Valancius and Nick Feamster. “Managing BGP Routes with a BGP Session Multiplexer”. Georgia Tech, Tech report: GT-CS-08-05, August 2008.

Sapan Bhatia, Murtaza Motiwala, Wolfgang Muhlbauer, Vytautas Valancius, Andy Bavier, Nick Feamster, Larry Peterson and Jennifer Rexford. “Hosting Virtual Networks on Commodity Hardware”. Georgia Tech, technical report GT-CS-07-10.

Vytautas Valancius and Nick Feamster. “Layering the Interdomain Layer”. Presto 2007.

Vytautas Valancius. Masters Degree thesis: “GMPLS Extensions to BGP”. ICT/ECS-2006-62. Royal Institute of Technology (KTH), Sweden.

Work Experience

Network Consultant February 2003 - July 2006
Santa Monica Networks, Ltd. Vilnius, Lithuania
Santa Monica Networks, Ltd. is a leading system integrator in Scandinavia and Baltic region.

Duties:

- Designing, planning and deploying complex data and voice networks for ISPs and Enterprises
- Pre-sale and post-sale consulting

Key Projects (partial list):

- Design and deployment of VoIP services for residential users in largest residential ISP in Vilnius city UAB Skynet (www.skynet.lt)
- Feasibility study and design of nation-wide DWDM network for AB Lietuvos Energija. (www.lpc.lt)
- Feasibility study, design and deployment of nation-wide IP/MPLS backbone with L3-VPN services for Lithuanian governmental ISP InfoStruktura (www.is.lt)
- Design and deployment of nation-wide IP/MPLS backbone with L2/L3-VPN services and advanced traffic engineering for AB Lietuvos Energija (www.lpc.lt)
- Feasibility study, design and deployment of metro FTTH network upgrade based on active Ethernet technology for largest residential ISP in Vilnius city UAB Skynet (www.skynet.lt)
- Design and implementation of redundant data center LANs for largest bank in Baltic region AB Hansa bankas (www.hansabankas.lt).

Network Engineer September 2002 - January 2003
Bluebridge, Ltd. Vilnius, Lithuania
BlueBridge is one of the largest IT solution companies in Lithuania.

Duties:

- Designing, planning and deploying data and voice networks for Enterprises
- Supporting Cisco, Enterasys and HP networking equipment
- Pre-sale and post-sale consulting

Key Projects (partial list):

- Design and implementation of redundant data center LANs for second largest mobile operator in Lithuania UAB Bite (www.bite.lt).

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Network Administrator July 2000 - September 2002
Vilnius University NOC Vilnius, Lithuania
VU Networks Operation Center is providing IT services for Vilnius University. VU NOC is also a local support center for LitNET Lithuanian academic institutions network.

Duties:

- Planning and supporting LitNET WAN
- Managing project on designing and deploying VoIP network between Lithuanian Universities.
- Supporting WWW, DNS and other services on Sun Solaris, Linux and FreeBSD systems

Awards and Honors

- Sam Nunn Security Program fellowship. Funded by McArthur Foundation. Fall 2008 - Spring 2008.
- CoNEXT'07 Travel Grant. New York, NY. December 2007.
- Georgia Tech Travel Grant for SOSp'07. October 2007.
- Article about me and KTH project in Tanzania. Largest Lithuanian daily "Lietuvos Rytas". June 2005.
- "The Youngest CCIE in Baltic States" article published on - www.cisco.lt. March 2005.
- CCIE#14359. February 2005.
- "Cygate Scholarship". Vilnius University. Sponsored by Cygate Lithuania Ltd.. September 2000.
- "Best student in Radio Electronics", 2nd place. National Chamber of Art and Science for Pupils(www.rmtkr.lt). May 1995.

Research Experience

BGP Multiplexing Fall 2007
Advisor Nick Feamster Georgia Tech
Designed and implemented BGP-Mux - a BGP session multiplexing system for virtual networks. BGP-Mux allows virtual networks to receive inter-domain route feeds from upstream ISPs. The work resulted in successful short paper in CoNEXT'07 conference. Implementation was done in C on *Quagga* - an open-source routing protocol package.

Better Branch Prediction through Machine Learning Fall 2007
Supervisor Professor Gabriel Loh Georgia Tech
I have preformed study on machine learning methods for branch prediction in modern CPUs. I have implemented and measured the performance of SVM Kernel mapping to branch history to improve learning on non-linearly-separateable data.

Time Dilation for VMs Spring 2007
Supervisor Professor Sam King University of Illinois at Urbana-Champaign
Implementation of Xen Virtual Machine Hypervisor modifications to support time dilation. The implemented system was used together with Modelnet network virtualization stack. The research results allowed distributed system researchers to suspend VMs and reconfigure network parameters on the fly.

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Network Virtualization on Commodity

Summer 2007

Hardware

Advisors Professor Jennifer Rexford and
Professor Larry Peterson

Princeton University

Research on network virtualization using commodity hardware within framework of VINI Project. I have designed and developed extensions to Linux Kernel to support Ethernet tunneling for virtual nodes in VServers environment. The work enabled virtual topology embedding on network built of commodity hardware and Linux operating system.

Graduate Research Assistant: ICTanzania Project with SIDA

Spring 2005

Advisor Professor Bjorn Pehrson

KTH - Sweden

Lead the team of the ICTanzania project in Dar Es Salaam, Tanzania. Our team performed fiber infrastructure survey in rural areas of Tanzania and produced a report that got media attention in Sweden. We also deployed working VoIP system between Tanzania's major academic institutions and organized a workshop promoting broadband use. The whole project lasted for 4 months and during 2 of them all team was in Tanzania.

Graduate Research Assistant: GMPLS

Fall 2005

Extensions to BGP

Advisor Professor Bjorn Pehrson

KTH - Sweden

Design and development of GMPLS extensions to BGP protocol. The extensions allowed GMPLS network updates to be announced on inter-domain BGP links. I have implemented all these extensions in C on *Quagga* open-source routing protocol suite.

Research Assistant: LitNET VoIP

Fall 2002

Infrastructure

Supervisor Algimantas Kutka

Vilnius University

Designed and deployed VoIP infrastructure for Lithuanian research network spanning all major Lithuanian Universities. I have implemented significant modifications to *Vovida Vocal* open-source SIP-based VoIP soft-switch. The bulk of the project was done using Java programming language and Eclipse IDE.

Teaching Experience

Teaching Assistant

Spring 2007

University of Illinois at Urbana-Champaign
CS 433G Computer System Organization (Graduate Section)

Teaching Assistant

Fall 2006

University of Illinois at Urbana-Champaign
CS 427 Software Engineering I

Instructor

Spring 2003/2004

Vilnius University
Cisco Network Academy: Computer Networks - Routing Protocols

Instructor

Fall 2003

Vilnius University
Cisco Network Academy: Computer Networks - Switching

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Presentations & Panels

- Graduate student panel: “FOCUS Recruiting Program”. Georgia Institute of Technology, Atlanta GA (January 2008)
- Poster “Multiplexing BGP Sessions with BGP-Mux” in CoNEXT 2007, New York NY (December 2007)
- Invited talk “Diminishing Obstacles to Routing Innovation”. Alcatel-Lucent Bell-Labs, Murray Hill, NJ (August 2007)
- Invited talk “Layering the Interdomain Layer”. PRESTO’07. Princeton University, Princeton NJ (May 2007)
- Guest lecture A Tutorial on Optical Networking. CSD course in Royal Institute of Technology (KTH), Stockholm, Sweden (February 2006)
- Guest lecture “Windows Network Integration“. Computer Networks course in Vilnius University, Faculty of Physics. Vilnius, Lithuania (March 2002)

Service and Extracurricular activities

Service:

- Georgia Tech Executive Round Table, Member (2009-Present).
- Georgia Tech Graduate Student Advisory Board, Member (2009-Present).
- Georgia Tech Graduate Student Senate, Senator (2009-Present).
- College of Computing Graduate Student Council, PhD Recruiting Coordinator (2007-2009).
- HotNets’07 Volunteer. Georgia Institute of Technology (November 2007)
- Member. ACM Special Interest Group for Computer Communications (SIGCOMM)
- Ambassador to Atlanta. “Vilnius Ambassador” program (2008)

Extracurricular activities:

- Long distance running. Completed a couple of half-marathons.
- Sailing. Member of GT Sailing Club.
- Salsa dancing, rock climbing, photography.

Experience and Skills

Programming Languages

- Python and PyDev in Eclipse. Twisted framework, Pylab and Numpy packages.
- C/C++ in open-source environment: sockets, multi-threading, memory debugging, source repository management, Bash/Tcl scripting for testing, etc.
- Java, Eclipse environment sockets, common patterns, source versioning systems.

Scientific tools

- Quagga open-source suite, Daytona TCP/IP stack, Matlab, NS-2.
- Xen Hypervisor, VServers and OpenVZ OS level virtualization toolkits. Emulab facility.

Systems

- FreeBSD, Linux, Solaris9 operational experience
- Linux (both user-land and kernel) operational and development experience
- Cisco IOS operational experience

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Network protocols and technologies (including, but not limited to):

- IEEE developed Ethernet and Wireless technologies: Ethernet, Spanning Tree Protocol (D/w/s and all the other flavors in the industry), Provider Bridges, IEEE 802.11a/b/g (MAC layer, security, roaming)
- All major IETF developed protocols. STD5, STD6, STD7 and RFC1812; PPP and all its applications (PPPoE, PPPoA, Multilink PPP, etc.); RIP&RIPng; OSPF; IS-IS; BGP (MP-BGP, RFC2547bis, etc.); HSRP&VRRP; MPLS protocol suite (TDP, LDP, RSVP-TE, GMPLS RSVP-TE, etc.).
- Optical networking technologies: ITU-T SONET/SDH, CWDM, DWDM transmission and protection schemes, ROADMs, VOAs, etc.

Networking Equipment

- All Cisco routers and switches, beginning with Catalyst 1900 and ending with GSR
- Main Juniper, HP and Enterasys platforms

Languages

- Native fluency in Lithuanian and Russian
- Fluent in English conversational fluency in German

References

Professor Nick Feamster (Georgia Institute of Technology, School of CS)

Phone: (404)385-1944

Email: feamster@gatech.edu

Professor Jennifer Rexford (Princeton University, CS Department):

Phone: (201)234-7699

Email: jrex@cs.princeton.edu