

# Peyman Kazemian

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- SUMMARY**
- Ph.D in Computer Networks from Stanford University.
  - Work experience at Google, Ericsson and Canon.
  - Research and Coursework expertise in Computer Networking, Computer Systems and Large Scale Data Mining.
- EDUCATION**
- Ph.D.*, Electrical Engineering expected April 2013  
Stanford University, Stanford, CA  
Thesis: Header Space Analysis  
Advisor: Prof. Nick McKeown
- Graduate School of Business Certificate* Jul 2010  
Summer Institute for Entrepreneurship Program  
Stanford University, Stanford, CA
- M.Sc.*, Electrical Engineering Jun 2009  
Stanford University, Stanford, CA  
Concentration: Computer Networks  
GPA: 4.0 / 4.0
- B.Sc.*, Electrical Engineering Jun 2007  
Sharif University of Technology, Tehran, Iran  
Concentration: Communication Systems  
GPA: 19.02 / 20, Class Rank: 1 / 160
- COMPUTER SKILLS**
- ◇ *Programming*: well-versed in Python, C++, C, Java, Objective-C, Matlab; familiar with X86 Assembly, Shell Scripting, Perl, Ruby.
  - ◇ *Web Programming*: HTML, CSS, JavaScript, jQuery, PHP.
  - ◇ *Web Framework*: Django, Ruby on Rails.
  - ◇ *Database*: MySQL.
  - ◇ *Parallel Programming*: Map-Reduce on Hadoop.
  - ◇ *Hardware Design*: Verilog HDL.
  - ◇ *IDE* : Eclipse, Xcode, NetBeans, MS Visual Studio.
  - ◇ *Operating Systems*: Unix, Mac OS, Windows.
- SELECTED COURSEWORK**
- ◇ *Network Systems* : Advanced Topics in Computer Networks, Build an Internet Router, Packet Switch Architecture.
  - ◇ *Computer Systems* : Operating Systems, Advanced Topics in Operating Systems, Computer Architecture, Database Systems, Compilers.
  - ◇ *Programming and Security*: iPhone Programming, Introduction to Cryptography, Web Programming and Security, Programming Abstraction.
  - ◇ *Data Mining and Machine Learning* : Data Mining, Artificial Intelligence, Information Retrieval and Web Search.
  - ◇ *Math* : Convex Optimization, Linear Algebra, Statistical Signal Processing, Information Theory, Probability and Statistics.

## WORK EXPERIENCE

*Google Inc., Mountain View, CA.* Summer 2012  
Software Engineer Intern – Network Research Team.

- Developed NetPlumber – A real time policy and invariant checker for software defined networks, which can check the compliance of each network update, such as insertion or deletion of new rules in millisecond time scale.

*Ericsson Research Lab., San Jose, CA.* Summer 2009  
Intern Researcher – OpenFlow-MPLS project.

- Developed MPLS support for OpenFlow v0.89 with a reference implementation on NetFPGA.

*Canon Development America, Irvine, CA.* Summer 2008  
Software Developer – Remote UI project.

- Designed and implemented an audio and screen capturing and sampling system in the server side.
- Implemented an audio and video synchronization and reconstruction system in the client side.

## RESEARCH PROJECTS

*NetPlumber:* A real time policy and invariant checker for software defined networks, which can check the compliance of each network update, such as insertion or deletion of new rules in millisecond time scale. NetPlumber is based on Header Space Analysis.

*Automatic Test Packet Generation:* A framework to systematically generate test packets in the network based on network state. The goal is achieving maximum testing coverage with minimum number of test packets.

*Header Space Analysis:* A protocol agnostic modeling framework for networks that allows checking networks for different properties such as reachability of end hosts, isolation of slices, detecting loops and finding black holes, etc.

*Opt-In-Manager:* A web-based system that allows users in an OpenFlow network to delegate control of their traffic to services available in the network.

## COURSE PROJECTS

*vDine iPhone app:* An iPhone app for location based discovery of restaurants and browsing their menu and rating menu entries, with Facebook integration to see friends ratings. Includes a Django-based server.

*Music recommendation system:* A “collaborative filtering” based music recommendation system using Yahoo! music ratings data corpus, obtained between years 2002-2006.

*NetFPGA-based IPv4 router with QoS:* A 4 port 1Gb/Sec IP router with DRR QoS support build on NetFPGA card. Selected as best class project.

*Little dog robot:* Control of a Dog Robot to climb cliffs and pass through hard terrains, using supervised learning.

*PintOS mini operating system:* Threading System, System Calls, Virtual Memory and File System implementation for PintOS educational operating system.

*DECAF mini compiler:* Complete compiler for DECAF educational programming language. Project includes Implementation of Lexical Analysis using Flex, Syntax analysis using Bison, Semantic Analysis and TAC (Three Address Code) generation.

**PATENTS & PUBLICATIONS**

*P. Kazemian, M. Chang, H. Zeng, G. Varghese, N. McKeown, S. Whyte, "Real Time Network Policy Checking using Header Space Analysis", to be presented in 10th USENIX Symposium on Networked Systems Design and Implementation (NSDI 13), April 2013, Lombard, IL*

*H. Zeng, P. Kazemian, G. Varghese, N. McKeown, "Automatic Test Packet Generation", In 8th Conference on emerging Networking Experiments and Technologies (CoNEXT 12) , December 2012, Nice, France*

*P. Kazemian, G. Varghese, N. McKeown, "Header Space Analysis: Static Checking For Networks", In 9th USENIX Symposium on Networked Systems Design and Implementation (NSDI 12), April 2012, San Jose, CA*

*H. Zeng, P. Kazemian , G. Varghese, N. McKeown, "A Survey of Network Troubleshooting", Stanford Technical Report ,TR12-HPNG-061012*

*J. Kempf, S. Whyte, J. Ellithorpe, P. Kazemian, M. Haitjema, N. Beheshti, S. Stuart, H. Green, "OpenFlow MPLS and the Open Label Switched Router", In 23rd International Teletraffic Congress (ITC 11), September 2011, San Francisco, CA*

*K.K. Yap, M. Kobayashi, D. Underhill, S. Seetharaman, P. Kazemian, N. McKeown, The Stanford OpenRoads Deployment, In 4th ACM international workshop on Experimental evaluation and characterization (WINTECH 09), September 2009, Beijing, China*

*R. Sherwood, et. al., "Carving Research Slices out of your Production Networks with OpenFlow" In Proceedings of ACM SIGCOMM, Barcelona, Spain, August 2009 (Best Demo Award)*

*S. Bailey, K. Lloyd, P. Kazemian, "Remote Control of a Host", USPTO Application #20100211882*

**INVITED TALKS**

Topic: *Header Space Analysis: Static Checking for Networks*  
At: Google (Jul 2011), Facebook (Aug 2011), Broadcom (Dec 2011), Internet 2 Joint Techs (Jul 2012), IETF (Nov 2012).

Topic: *Header Space Analysis and Automatic Test Packet Generation*  
At: Insieme (May 2012), Brocade (Jun 2012), Nicira Systems (Jul 2012).

**TEACHING EXPERIENCE**

<i>Packet Switch Architecture (Stanford EE384X)</i>	Spring 2010, Spring 2012
<i>Introduction to Database (Stanford CS145)</i>	Fall 2011
<i>Mining Massive Datasets (Stanford CS246)</i>	Winter 2011
<i>Microprocessors I (Sharif University 25754)</i>	Fall 2006, Spring 2007

## **HONORS & AWARDS**

- ◇ Awarded IRTF Applied Networking Research Prize, IEFT85, Atlanta, GA.
- ◇ Recipient of 3-year Stanford Graduate Fellowship (SGF) from Stanford University.
- ◇ Recipient of 1-year Numerical Technologies Founders Fellowship.
- ◇ Recipient of 1-year Departmental Fellowship from Electrical Engineering department at Stanford University.
- ◇ Ranked 4 in 160 participants of 2008 PhD Qualifying Exam of Electrical Engineering department, Stanford University.
- ◇ Selected as the Distinguished Student in Electrical Engineering department, class of 2007 at Sharif University of Technology.
- ◇ Ranked 19th out of 400,000 participants of 2003 nationwide Irans universities entrance exam.

## **VOLUNTARY ACTIVITIES**

- Program committee member of WRiPE 2012 conference.*
- Co-organizer of Stanford Networking Seminar (Sep 2009–Now).*
- Ombudsperson at Persian Student Association (PSA), Stanford University (Sep 2010–Jun 2011).*
- Board Member and Financial Officer at Persian Student Association (PSA), Stanford University (Sep 2009– Jun 2010).*