Yiyang Chang

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Education

Purdue University — West Lafayette, IN
Ph.D. student in Computer Engineering, ECE — *Aug 2013 – Present*
- GPA: 4.0/4.0 (updated to Fall 2016)

Peking University — Beijing, China
B.S. in Micro-electronics, EECS — *Sept 2009 – July 2013*
- GPA: 3.8/4.0 (Major), 3.6/4.0 (Overall)

Research Experience

Robust Validation of Network Design — Purdue, West Lafayette, IN
Advisors: Prof. Sanjay Rao and Prof. Mohit Tawarmalani — *Oct 2015 – Present*
- Designed a generic optimization framework for validating network designs, under uncertain failures and demands
- Implemented the framework in GAMS and Pyomo, and evaluated with real-world traffic matrices

Scalable Distributed SDN Controller — Purdue, West Lafayette, IN
Advisors: Prof. Sanjay Rao and Prof. T. N. Vijaykumar — *Nov 2014 – July 2015*
- Designed a framework to optimize distributed SDN controllers with functional partition instead of conventional topological partition
- Hacked Floodlight SDN controller source (Java, sloc: 100k) to design experiments for evaluation

App-specific VM Selection in the Cloud — Purdue, West Lafayette, IN
Advisors: Prof. Sanjay Rao and Prof. T. S. Eugene Ng — *Sept 2013 – Aug 2014*
- VM selection based on historical data and online measurement, with cost controlled by machine learning and pruning algorithms
- Investigated the root cause of performance variation on EC2

Industry Experience

Software Development Engineer Intern — Microsoft, Redmond, WA
Manager: Praveen Balasubramanian — *May 2016 – July 2016*
- Prototyped TCP CUBIC congestion control in Windows OS

- Demonstrated a performance improvement in data transfer throughput compared with conventional congestion control algorithm

Software Development Engineer Intern Huawei, Santa Clara, CA
Mentors: Dr. Shuo Yang and Dr. Haoyu Song *May 2014 – Aug 2014*

- Implemented a physical SDN with Pica8 switches and Ryu controller
- Built an SDN-based cloud monitoring system combining OpenStack, Ryu, and Ganglia

Publications

- **Yiyang Chang**, Sanjay Rao, and Mohit Tawarmalani. "Robust Validation of Network Designs under Uncertain Demands and Failures", **NSDI**, 2017.
- **Yiyang Chang**, Ashkan Rezaei, Balajee Vamanan, Jahangir Hasan, Sanjay Rao, and T. N. Vijaykumar. "Hydra: Leveraging Functional Slicing for Efficient Distributed SDN Controllers", **IEEE COMSNETS**, 2017.
- **Yiyang Chang**, Gustavo Petri, Sanjay Rao, and Tiark Rompf. "Composing Middlebox and Traffic Engineering Policies in SDNs", **INFOCOM Workshop SWFAN**, 2017.
- Mohammad Hajjat, Ruiqi Liu, **Yiyang Chang**, T. S. Eugene Ng, and Sanjay Rao. "Application-Specific Configuration Selection in the Cloud: Impact of Provider Policy and Potential of Systematic Testing", **IEEE INFOCOM**, 2015.

Research Interests

- Traffic Engineering
- SDN and NFV
- Optimization
- Cloud Computing
- Distributed Systems

Course Projects

Linux Kernel Hacking ECE 695: Operating System

- Developed a usage-limiting CPU scheduler based on Linux Complete Fair Scheduler
- Visualized the memory page reference count in a Linux-ARM kernel
- Developed a basic shell featuring pipe, background, zombie process cleanup, etc.

Paxos, Reliable Multicast, and Byzantine Generals CS 505: Distributed System

- Implemented a Paxos-based replication protocol, a total-ordering multicast service, and the Byzantine Generals algorithm in C

Compiler for LITTLE ECE 573: Compiler

- Developed a full-fledged compiler for a lightweight language, LITTLE, with flex and bison in C++

Web Application ECE 595: Computer Network Systems

- Optimized the performance of a web application with a multi-tier design on Amazon EC2

Socket Programming ECE 463: Intro to Computer Networking

- Developed an event-driven concurrent web server using select()
- Implemented a simple version of distance-vector routing protocol

Honors, Awards and Grants

NSDI 2017 Travel Grant	*Mar 2017*
Sigcomm 2015 Travel Grant	*Aug 2015*
SOSR 2015 Travel Grant	*June 2015*
National Scholarship, Peking University	*Dec 2012*
Google Excellence Scholarship, Google Inc.	*May 2012*
Outstanding Student Award, Peking University	*Dec 2012*

Technical Skills

Programming	C/C++ (proficient), Python, Java, Shell Script, Matlab
Software-Defined Network	ONOS, Floodlight, Ryu, Mininet, Open vSwitch, Wireshark
Optimization	GAMS, Pyomo, CPLEX, Gurobi, BARON
Kernel Debugging	WinDbg, QEMU, Hyper-V, VirtualBox
Cloud Development	Amazon Web Services, OpenStack
Software Development	Git, Vim, GDB, Make, LaTeX

Teaching Experience

TA for ECE 595: Computer Network Systems	*Spring 2017*
TA for ECE 463: Introduction to Computer Networking	*Fall 2015*
TA for ECE 201: Linear Circuit Analysis I	*Spring 2014 to Spring 2015*
TA for ECE 270: Introduction to Digital System Design	*Fall 2013*

References

Sanjay Rao (advisor)

Associate Professor
Electrical and Computer Engineering
Purdue University
Email: sanjay@ecn.purdue.edu

Mohit Tawarmalani
Professor and Allison and Nancy Schleicher Chair of Management
Krannert School of Management
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Email: mtawarma@purdue.edu

T. N. Vijaykumar
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Purdue University
Email: vijay@ecn.purdue.edu

Praveen Balasubramanian
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Microsoft
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