Michael Chang | Curriculum Vitae

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Second Year Ph.D. student with interests spanning cloud computing, microservice management, distributed systems, and networks.

Education

- **University of California, Berkeley** — **Berkeley, CA**
  Computer Science, Ph.D. Candidate, — *2016–present*
  Adviser: Scott Shenker
- **Princeton University** — **Princeton, NJ**
  Computer Science, Bachelors of Science in Engineering with Honors — *2012–2016*
  Adviser: Jennifer Rexford
- **ETH Zürich** — **Zürich, Switzerland**
  Computer Science, Study Abroad in Computer Science — *2015 Spring*
  Adviser: Laurent Vanbever, Theophilus Benson

Recent Research Projects

- **ThrottleBot: Performance without insight.**
  In Submission. In this project, we developed Throttlebot, a system that automates resource provisioning for microservice-based applications. ThrottleBot uses empirical observation to determine the impact of microservice-level resource allocation on application performance, and uses this information to automatically provision resources. By integrating Throttlebot with the container orchestrator (e.g., Kubernetes) , we believe ThrottleBot represents an important step in simplifying the development and deployment of large scale micro-service based applications.
- **Network Support for Distributed Machine Learning**
  Scaling out machine learning over a distributed system is a high priority. We are studying the impact of the network over distributed machine learning and developing network protocols to reduce congestion at the network core.
- **Network Chaos Monkey** *'Increasing Network Resiliency through Failure Injection'*
  Testing network control software should follow in the footsteps of large scale distributed systems, such as those of Netflix or Google, which deliberately induce live failures in their production environments and analyze how their control software reacts. We developed and evaluated a framework, Armageddon, for introducing sustainable and systematic chaos in networks. When we cause failures, we do so without violating some operator-specified network invariants (e.g., end-to-end connectivity).

Previous Employment

- **Transdev International** — **Paris, France**
  Data Science Intern — *June 2016 - September 2016*
  Special Adviser to the Chief Performance Officer on data strategy. Managed extraction and transformation of data between different public transporation agencies, and demonstrated value by collecting and analyzing data in order to forecast revenue across major Paris suburbs.

- **Big Switch Networks** **Santa Clara, CA**
  Engineering Intern *June 2015 - September 2015*
  Evaluated feasibility of machine learning and deep packet inspection for network traffic classification. Implemented and designed analytics to provide advanced network fabric visibility for monitoring and predictive identification of network failures.
- **Hewlett Packard Enterprise** **Santa Clara, CA**
  Software Defined Networking Intern *June 2014 - September 2014*
  Integrated HP Network Cloud Manager and HP SDN Controller, demonstrated feasibility through custom development of firewall and QOS policies

Honors and Awards

- **2016**: NSF Graduate Research Fellowship

Publications

Michael Alan Chang, Brendan Tschaen, Theophilus Benson, and Laurent Vanbever. Chaos monkey: Increasing sdn reliability through systematic network destruction. *SIGCOMM Comput. Commun. Rev.*, 45(4):371–372, August 2015.

Nick Shelly, Brendan Tschaen, Klaus-Tycho Förster, Michael Chang, Theophilus Benson, and Laurent Vanbever. Destroying networks for fun (and profit). In *Proceedings of the 14th ACM Workshop on Hot Topics in Networks*, HotNets-XIV, pages 6:1–6:7, New York, NY, USA, 2015. ACM.

Michael Alan Chang, Thomas Holterbach, Markus Happe, and Laurent Vanbever. Supercharge me: Boost router convergence with sdn. *SIGCOMM Comput. Commun. Rev.*, 45(4):341–342, August 2015.

M.A. Chang. Intelligent gateway for heterogeneous peer-to-peer home automation networks, December 27 2011. US Patent 8,086,757.

M.A. Chang. Peer-to-peer home automation management, May 29 2012. US Patent 8,190,275.