Raymond Cheng

CONTACT INFORMATION	Networks Laboratory Computer Science and Engineering University of Washington 185 NE Stevens Way Box 352350 Seattle, WA 98195 USA	*E-mail:* ryscheng@cs.washington.edu *WWW:* raymondcheng.net

EDUCATION

University of Washington, Seattle, WA — Apr 2011 - present
Ph.D. Candidate in Computer Science — GPA: 3.85/4.0
- Thesis: *Strong User Isolation for Scalable Web Applications*
- Advisor: Prof. Tom Anderson and Prof. Arvind Krishnamurthy

M.S. in Computer Science — GPA: 3.85/4.0

Massachusetts Institute of Technology, Cambridge, MA — Aug 2009 - Aug 2010
M.Eng. in Electrical Engineering and Computer Science — GPA: 4.8/5.0
- Thesis: *WhanauSIP - A Secure Peer-to-Peer Communications Platform*
- Advisor: Prof. Frans Kaashoek and Dr. Chris Lesniewski-Laas

Massachusetts Institute of Technology, Cambridge, MA — Aug 2005 - Jun 2009
B.S. in Electrical Engineering and Computer Science — GPA: 4.6/5.0
B.S. in Physics

Delaware Valley High School, Milford, PA — Aug 2001 - Jun 2005
Valedictorian (class size of 377) — GPA: 4.9/4.0

RESEARCH STATEMENT

My research interests are in distributed systems and security, with a focus on web security and privacy. I am interested in building novel systems that broaden the rights held by Internet users. These projects include privacy-preserving systems that give users better control over their data and systems that spread digital freedom of speech and information to citizens around the world.

AWARDS AND HONORS

- Facebook Fellowship Finalist — Feb 2013

- Madrona Runner-Up Prize for Best Poster — Oct 2012
  for "FreeDOM: a New Baseline for the Web"

- Wissner-Slivka Graduate Fellowship — Sep 2011 - Jun 2012

PUBLICATIONS

[1] Cheng, R., Scott, W., Ellenbogen, P., Howell, J., Roesner, F., Krishnamurthy, A., and Anderson, T. *Radiatus: a Shared-Nothing Server-Side Web Architecture.* ACM Symposium on Cloud Computing (SOCC). 2016

[2] Zhang, I., Lebeck, N., Fonseca, P., Holt, B., Cheng, R., Norberg, A., Krishnamurthy, A., Levy, H. *Reactor: Automating Data Management and Storage for Wide-area, Reactive Applications.* 11th USENIX Symposium on Operating Systems Design and Implementation (OSDI). 2016.

[3] Bhoraskar, R., Langenegger, D., He, P., Cheng, R., Scott, W., and Ernst, M. *User scripting on Android using BladeDroid.* The 5th ACM SIGOPS Asia-Pacific Workshop on Systems (APSYS). 2014.

[4] Scott, W., Cheng, R., Li, J., Krishnamurthy, A., and Anderson, T. *Blocking-Resistant Network Services using Unblock.* UW Technical Report. 2014.

[5] Cheng, R., Schueppert, M., Becker, H., and Thakur, M. *SolocoRank: Social Signals for Local Search Quality.* UW Technical Report. 2013.

[6] Cheng, R., Scott, W., Krishnamurthy, A., and Anderson, T. *FreeDOM: a New Baseline for the Web.* The 11th ACM Workshop on Hot Topics in Networks (HotNets XI). 2012.

[7] Cheng, R., Hong, Ji., Kyrola, A., Miao, Y., Weng, X., Wu, M., Yang, F., Zhou, L., Zhao, F., and Chen, E. *Kineograph: Taking the Pulse of a Fast-Changing and Connected World.* Proceedings of the 7th ACM European Conference on Computer Systems (Eurosys). 2012.

THESES

[8] Cheng, R. *Kineograph: Taking the Pulse of a Fast-Changing and Connected World.* Advised by Lidong Zhou. University of Washington, CSE Qualifying Exam, April 2012.

[9] Cheng, R. *WhanauSIP - A Secure Peer-to-Peer Communications Platform.* Advised by Frans Kaashoek. Massachusetts Institute of Technology M.Eng. thesis, August 2010.

[10] Cheng, R. *Whanaungatanga and P2P-SIP: Sybil-Proof Distributed Hash Table Implementation and its Role in P2P-SIP Telephony.* Advised by Frans Kaashoek. Massachusetts Institute of Technology Undergraduate thesis, May 2009.

PATENTS

[11] Yang, F., Zhou, L., Wu, M., Kyrola, A., Cheng, R., Miao, Y., Weng, X., and Hong, J. *Platform for Continuous Graph Update and Computation.* Patent Number 9244983. Microsoft Research, submitted 2011.

INVITED TALKS AND CONFERENCE PRESENTATIONS

[12] **Radiatus: a Shared-Nothing Server-Side Web Architecture.**
- SOCC: ACM Symposium on Cloud Computing. Santa Clara, CA. Oct 2016

[13] **uProxy: a Social Proxy for your Browser**
- Circumvention Tech Festival. Valencia, Spain.   Mar 2015
- TA3M. New York, NY.   Nov 2014
- RIPE69. London, United Kingdom.   Nov 2014

[14] **User scripting on Android using BladeDroid**
- APSYS: ACM Asia-Pacific Workshop on Systems. Beijing, China. Jun 2014
- Microsoft Research Asia. Beijing, China.   Jun 2014

[15] **uProxy: Crowdsourcing in the Face of Digital Repression**
- Google Ideas Summit. New York, NY.   Oct 2013
- YouTube. http://www.youtube.com/watch?v=aGOXMRJWSeg

[16] **FreeDOM: a New Baseline for the Web**
- HotNets XI: Hot Topics in Networks. Redmond, WA.   Oct 2012

[17] **Kineograph: Taking the Pulse of a Fast-Changing and Connected World**
- Eurosys Conference. Bern, Switzerland.   Apr 2012
- Stanford MobiSocial Seminar. Palo Alto, CA.   Apr 2012
- Palantir. Palo Alto, CA.   May 2012

[18] **Donor Appreciation Speech**
- UW CSE Fellowship Luncheon. Seattle, WA.   Apr 2012

OPEN SOURCE
PROJECTS

uProxy
- Website: uproxy.org
- Source Code: https://github.com/uProxy/uProxy

Radiatus
- Website: radiatus.io
- Source Code: https://github.com/freedomjs/radiatus

freedom.js
- Website: freedomjs.org
- Source Code: https://github.com/freedomjs/freedom

OneSwarm
- Website: oneswarm.org
- Source Code: https://github.com/UWNetworksLab/OneSwarm

STUDENT
ADVISING

- James Liu 2015-2016
- Elizabeth Wei 2014
- Bonnie Pan 2014
- Nick Martindell 2013-2014
- Paul Ellenbogen 2013-2014
- Tariq Yusuf 2012-2014
- Caylan Lee 2012-2013
- Nicholas Shahan 2012-2013

PROFESSIONAL
EXPERIENCE

Google New York, NY

Google Ideas, Lucas Dixon and Jared Cohen Sep 2014 - Jan 2015
- Sponsored development on uProxy, an open source project that I started while at the University of Washington in 2012. Worked closely with Google engineers in developing features for Q4 release timeline. I also began work on uProxy Cloud, which provides a mechanism for users to deploy a private proxy to a virtual machine in the cloud that they can also share with friends. uProxy has helped thousands around the world get access to websites otherwise censored in their country.

Search Quality, Michael Schueppert and Mayur Thakur Jun 2012 - Sep 2012
- Developed a new ranking algorithm, SolocoRank, that leverages social media to rank physical establishments such as restaurants and bars. When compared to the state of the art at Google, I was able to demonstrate a 50% improvement in the number of search queries that returned better results for restaurants and bars in New York City. Furthermore, SolocoRank was able to accurately predict the Zagat score (0-30 scale) of an establishment to within +/-1 point, 44% of the time.

Microsoft Research Asia Beijing, China

System Research Group, Dr. Lidong Zhou Apr 2011 - Aug 2011
- Began the Kineograph research project at Microsoft, a continuous graph computation engine. I designed a system that could provide real-time graph analysis of social data with better freshness guarantees, such that new data from Twitter streams would be reflected in our results within 1-2 minutes. Kineograph served as a platform for other applications of interest, such as user ranking and approximate shortest paths, incrementally updating results as new data was fed into the system. Under my direction, the project opened new possibilities within the group and the team grew to include five other interns and fulltime employees. The paper was accepted into the Eurosys 2012 conference.
- Started the MSRA dance club. Taught weekly classes to interns and employees, culminating in a performance to the organization. The club continued to exist after my departure.

TEACHING EXPERIENCE	**UW Computer Science and Engineering** Robotics Systems Seminar (CSE590RS) Coordinator	Seattle, WA Jun 2016 - Sep 2016
	UW Computer Science and Engineering Networks Seminar (CSE590L) Coordinator Co-coordinators: Will Scott, Seungyeop Han	Seattle, WA Apr 2013 - Jun 2016
	UW Computer Science and Engineering Distributed Systems (CSE452) Teaching Assistant Lecturer: Tom Anderson	Seattle, WA Jan 2016 - Mar 2016
	UW Computer Science and Engineering Computer Systems (CSE550) Teaching Assistant Lecturer: Arvind Krishnamurthy	Seattle, WA Sep 2012 - Dec 2012
	UW Bioengineering Department Neural Engineering (BIOEN498C) Teaching Assistant Lecturer: Albert Folch	Seattle, WA Sep 2011 - Dec 2011

ORGANIZATIONS

- Electronic Frontier Foundation member — Oct 2011 - present
- USENIX member — Sep 2012 - present
- ACM Student member — Oct 2011 - present
- UW Science and Engineering Business Association member — Sep 2011 - Apr 2015
- MIT Imobilare Dance Group — Aug 2005 - Aug 2010
- MIT Ridonkulous — Dec 2009 - May 2010
- MIT Dance Troupe — Aug 2005 - May 2007
- MIT Society of Physics Students — Aug 2005 - Aug 2010

PROFESSIONAL SERVICE

- *9th USENIX Symposium on Networked Systems Design and Implementation (NSDI) 2014*
  Organized a Shadow PC at UW
- *Tiny Transactions on Computer Science. Volume II. 2013*
  PC Member
- *UW Innovation and Entrepreneurship Conference 2013*
  CSE Department Liaison

SERVICE

High School Outreach
Presented to high school students from around the country on the exciting possibilities of a career in computer science. Presentations included live demos and college advice.

- NEPA Girls Who Code Scranton, PA. — Apr 2015 - Dec 2015
- Delaware Valley H.S. Milford, PA — Dec 2012 - Dec 2015
- UW CSE Open House, Seattle, WA — Dec 2012 - Dec 2013
- Meadowdale H.S. Lynnwood, WA — Nov 2012

Hackathon Mentorship

- Grace Hopper Open Source Day, Houston, TX — Oct 2015
- NYUAD International Hackathon for Social Good in the Arab World, Abu Dhabi, UAE. — Feb 2014

UW Science and Engineering Business Association (SEBA)

VP of Operations   Feb 2013 - Apr 2015
- Managed the UW SEBA website, with $> 20,000$ page views per month. Updated the infrastructure to handle more traffic at scale by configuring use of content distribution networks and new productivity systems.

Mentorship Program Coordinator   May 2012 - Jun 2013
- Managed the UW SEBA mentorship program, the largest science and engineering mentorship program on campus. I coordinated meetings with nearly 30 influential professionals and businessmen in the Seattle area, and facilitated discussions between mentors and over 100 student participants.

New Graduate Student Orientation Organizer
UW Computer Science and Engineering Department   Aug 2012
- Co-organized the orientation for 50 incoming PhD students in the department. The two-day event consisted of a series of talks and social events.

Imobilare Dance Group President   Aug 2005 - Aug 2010
- As president, I led the group expansion from 2 members, to over 20 dedicated performers.
- Along with a partner, we created and managed one of the largest annual freestyle dance competitions in Boston for 3 years, Breakonomics.
- Managed the largest weekly open breakdance practice session in the city.
- Choreographed over 5 pieces for performance, including an opening for a Lupe Fiasco concert.
- Taught weekly lessons to new aspiring student dancers.

RELEVANT COURSEWORK

Systems and Networking: CSE544 Databases, CSE548 Architecture, CSE550 Computer Systems, 6.824 Distributed Systems Engineering, 6.828 Operating Systems Engineering, 6.829 Computer Networks, 6.033 Computer Systems Engineering, 6.004 Computation Structures
Artificial Intelligence: CSE571 Robotics, CSE546 Machine Learning, 6.833 Human Intelligence Enterprise, 6.034 Artificial Intelligence
Applications: CSE510 Human-Computer Interaction
Theory: 6.854 Advanced Algorithms
Programming Systems: 6.001 Structure and Interpretation of Computer Programs
Electrical Engineering: 6.002 Circuits and Electronics, 6.003 Signals and Systems, 6.111 Modern Optics Laboratory, 6.012 Microelectronics
Math: 18.03 Differential Equations, 18.06 Linear Algebra, 18.440 Probability
Physics: 8.03 Vibrations and Waves, 8.033 Relativity, 8.04 Quantum Mechanics, 8.044 Statistical Physics, 8.07 Electromagnetism II, 8.13 Experimental Physics I

REFERENCES

Dr. Tom Anderson (tom@cs.washington.edu)
- Robert E. Dinning Professor, Computer Science and Engineering, University of Washington
- ⋆ *Dr. Anderson is my current PhD co-advisor*

Dr. Arvind Krishnamurthy (arvind@cs.washington.edu)
- Associate Professor, Computer Science and Engineering, University of Washington
- ⋆ *Dr. Krishnamurthy is my current PhD co-advisor*

Dr. Lucas Dixon (ldixon@google.com)
- Chief Scientist, Jigsaw (previously Google Ideas)
- ⋆ *Dr. Dixon is a collaborator on research projects.*

Dr. Jon Howell (jrh@google.com)
- ⋆ *Dr. Howell serves on my thesis committee.*

Dr. Lidong Zhou (lidongz@microsoft.com)
- Principal Researcher, Systems Research Group, Microsoft Research
- ⋆ *Dr. Zhou supervised my Kineograph project at MSRA in 2011.*

Additional references available upon request

uProxy

Select articles:

> *Google Unveils Tools to Access Web From Repressive Countries*
> http://business.time.com/2013/10/21/google-digital-rebels/
> *Google's uProxy: A Peer-to-Peer Gateway to Internet Freedom*
> http://mashable.com/2013/10/21/google-uproxy-internet-freedom/
> *Google announces uProxy: internet censorship avoidance in a browser extension*
> http://www.engadget.com/2013/10/21/google-ideas-uproxy/
> *'Running battle': How Google hopes to beat countries cracking down on Internet freedom*
> http://usnews.nbcnews.com/_news/2013/10/23/21080699-running-battle-how-google-hopes-to-beat-countries-cracking-down-on-internet-freedom
> *Google uProxy lets you surf securely through a friends connection*
> http://www.geek.com/apps/google-uproxy-lets-you-surf-securely-through-a-friends-connection-1574584/
> *This Google Browser Extension Will Allow You To Bypass Internet Censorship*
> http://www.fastcompany.com/3020362/fast-feed/this-google-browser-extension-will-allow-you-to-bypass-internet-censorship
> *Google unveils services promoting free expression*
> http://www.reuters.com/article/2013/10/22/google-tools-idUSL1N0IB25B20131022
> *UW CSEs uProxy unveiled at Google Ideas Summit in NYC*
> http://news.cs.washington.edu/2013/10/22/uw-cses-uproxy-unveiled-at-google-ideas-summit-in-nyc/
> *Get round internet censors using a friend's connection* http://www.newscientist.com/article/mg22 get-round-internet-censors-using-a-friends-connection.html

FreeDOM

> *Congratulations to the winners of the Madrona Prize and the Peoples Choice Awards!*
> http://news.cs.washington.edu/2012/10/24/congratulations-to-the-winners-of-the-madrona-prize-and-the-peoples-choice-awards/