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(Please email me if you need my phone number or postal address.)

RESEARCH INTERESTS

Develop and promote adoption of tools to make fundamental computing tasks (particularly programming) as easy as they conceptually can be for a wide range of users.

RESEARCH EXPERIENCE

- 9/2014–present **Ph.D. student in computer science** in the Software Design Group, **Massachusetts Institute of Technology**. Developing Object Spreadsheets (<http://sdg.csail.mit.edu/projects/objsheets/>), a spreadsheet tool with support for structured data to facilitate end-user development of data-centric web applications (paper in Onward! 2016).
- 5/2016–8/2016 Internship at Microsoft Research. Built a lightweight verification framework for web-based single sign-on implementations (<https://github.com/cs0317/svAuth/>) with Shuo Chen and Shaz Qadeer (short paper in IEEE SecDev 2016).
- 3/2011–5/2011 Implemented a wiki in the Servlet Information Flow framework (<http://www.cs.cornell.edu/jif/sif/>) as a case study.
- 9/2010–12/2010 Implemented a prototype TLS client and server that support arbitrary server authentication policies written in the Alpaca logic (see <http://pdos.csail.mit.edu/uia/>).
- 11/2009–1/2010 Research on strategies for automatic insertion of type coercions in a program with Michael Hicks, University of Maryland.
- 1/2006–9/2008 **Algorithms research** with Samir Khuller, University of Maryland:
- 6/2008–9/2008
- Developed software to match papers to reviewers, which was later used for POPL 2012. See <https://mattmccutchen.net/match/>.
- 8/2008
- Presented a paper (with Samir Khuller) on streaming algorithms for clustering very large sets of points at APPROX 2008. See <https://mattmccutchen.net/clustering/>.
- 4/2008
- Presented a paper on matching of people to positions with one-sided preferences at LATIN 2008. See <https://mattmccutchen.net/lumc/>.
- 6/2006–8/2006 Helped implement, tested, and evaluated a compiler and an inference tool for Javari, which consists of Java plus a reference immutability type qualifier. With Michael Ernst, Massachusetts Institute of Technology (Research Science Institute).
- 8/2005–1/2006 Developed an Eclipse plugin that helps Cyclone programmers understand why certain pointers require additional runtime overhead to maintain memory safety. With Michael Hicks, University of Maryland.

WORK EXPERIENCE

- 6/2015–8/2015 Internship with Microsoft Tools for Software Engineers team. Implemented and tested a concurrent protocol to migrate a data set while applications are accessing it, as a case study of the P# systematic concurrency testing tool. (<https://github.com/mattmccutchen/MigratingTable>, paper in FAST 2016.)
- 9/2011–8/2014 **Software engineer at Google.**
- 5/2012–8/2014
- Web Search SRE (production) team. On call, and extended Python-based system deployment tools to automate more steps of the process.
- 1/2012–5/2012
- Google Programmable Ads. Developed and maintained large integration tests in Python.

- 9/2011–1/2012 • AdWords front end. Completed two internal code migrations (Java).
- 6/2011–8/2011 Internship at MITRE Corporation. Co-lead for a proof-of-concept integration of web-based data analysis tools written by different teams into a common dashboard, using JavaScript and Java servlets.
- 7/2010–8/2010 Internship at Google. Strengthened data validation in a Java-based web service framework.
- 6/2010–5/2011 Deployed and analyzed security of web applications for the Office of Information Technology, University of Maryland (part time).
- 6/2009–8/2009 Internship at Bell Labs (Alcatel-Lucent) with Randeep Bhatia. Implemented a prototype system to deliver video to cell phones in the background.
- 6/2005–8/2005, 6/2006 Developer, CharityWeb (provider of Web services for nonprofits). Overhauled email list implementation to personalize messages to donors.
- 12/2004–12/2005 Developer and system administrator, Montgomery Blair High School. Maintained the school's shared shell server and made enhancements to the course management system.

TEACHING EXPERIENCE

- 2/2011 Gave a guest lecture about matching with one-sided preferences to a graduate-level algorithms course at the University of Maryland.
- 5/2006, 4/2007, 3/2008 Gave a lesson on the mathematical model of a single product market to AP Microeconomics classes at my high school; students said it greatly improved their understanding.

EDUCATION

- 8/2007–5/2011 B.S. in computer science and mathematics, University of Maryland College Park. University Honors Program, Baneker/Key scholarship. GPA 3.974. Graduate-level coursework including approximation algorithms, software verification, theory of programming languages, software security.
- 9/2003–5/2007 Montgomery Blair High School Science, Math, Computer Science Magnet Program. GPA 3.99 (unweighted), 4.86 (weighted).

OTHER PROJECTS

- 9/2010–1/2012 Contributed to IETF standardization of DNSSEC-based designation of TLS server certificates (<https://tools.ietf.org/wg/dane/>).
- 9/2005–3/2010 Contributed to rsync (<http://rsync.samba.org/>), a versatile open-source file-copying tool, and provided expert advice and clever solutions to users.
- 9/2007 Built a Web application to organize tennis games for a group of University of Maryland faculty members.
- 3/2006 Wrote an article about the USA Computing Olympiad for Imagine magazine (<http://cty.jhu.edu/imagine/>).

HONORS

- 4/2014 **National Science Foundation Graduate Research Fellowship.**
- 4/2009, 2/2010 ACM Intercollegiate Programming Contest World Finals: 20th place, 14th place (University of Maryland team).
- 11/2009 Computing Research Association Outstanding Undergraduate Research Award.
- 11/2008, 11/2009, 11/2010 Virginia Tech Regional Math Contest: first place 2008 and 2010, second place 2009.

- 4/2009, 4/2010 Aziz Scholarship from Math Department, University of Maryland.
5/2009 Pete Stewart Undergraduate Research Award from Computer Science Department, University of Maryland.
- 4/2009 J.R. Dorfman Prize for Undergraduate Research from College of Computer, Math, and Physical Sciences, University of Maryland.
- 1/2008 Appeared in *Hard Problems* documentary about the Math Olympiad (<http://hardproblemsmovie.com/>).
- 8/2005, 8/2006, 8/2007 **International Olympiad in Informatics:** gold medal 2007 and 2005, silver medal 2006.
- 6/2006, 6/2007 National champion, 2006 and 2007 USA Computing Olympiads.
1/2007 Finalist, 2007 Intel Science Talent Search.
- 4/2007 IBM Thomas J. Watson Memorial Scholarship.
- 3/2007 National Merit Scholar.
- 5/2006 Caltech Signature Award.
- 5/2005, 5/2006 USA Math Olympiad: winner 2006, honorable mention 2005.
- 4/2006 Invited to the Research Science Institute 2006. Final presentation was judged one of the top five.

EXTRACURRICULAR ACTIVITIES

- 2/2015–5/2015 Tutor, English as a Second Language for Service Employees, Massachusetts Institute of Technology.
- 6/2012–5/2014 Leader of the Young Adult Group at the Unitarian Universalist Church of Palo Alto.
- 10/2012–3/2014 English as a Second Language tutor and teaching assistant for the Building Skills Partnership (<http://www.buildingskills.org/>) at Google.
- 9/2013–3/2014 Tutored a local middle school student with Partners for New Generations (<http://www.pngmvla.org/>).
- 9/2007–5/2011 Member, University of Maryland Linux Users Group. Gave presentations about git and rsync.
- 1/2008–9/2010 Piano accompanist, University of Maryland Catholic Student Center.
- 9/2005–2/2007 President, Montgomery Blair High School Computer Club. Gave weekly lectures, most on programming competition techniques and problems.
- 2000–5/2007 Math teams and competitions including Mathcounts, American Regions Math League, Mandelbrot, and Calculus League.
- ~1995–8/2007 Piano: recitals and private lessons.

Comprehensive curriculum vitae, version 2016-11-07

Latest version: https://mattmccutchen.net/McCutchen_CV.pdf

Additional resources: <https://mattmccutchen.net/meta.html>