

Richard Matthew McCutchen

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RESEARCH INTERESTS

- Design of programming languages and systems
- Algorithms, including applications to other fields
- Computer security

EXPERIENCE

- 11/2009–1/2010 Research on strategies for automatic insertion of type coercions in a program with Michael Hicks, University of Maryland.
- 6/2009–8/2009 Internship at Bell Labs (Alcatel-Lucent) with Randeep Bhatia. Developed a prototype system to deliver video to cell phones in the background.
- 1/2006–6/2009 **Algorithms research** with Samir Khuller, University of Maryland:
- 6/2008–9/2008
- Developing software to match grant proposals to reviewers for the National Science Foundation.
- 8/2008
- Presented a paper (with Samir Khuller) on streaming algorithms for clustering very large sets of points at APPROX 2008. See <http://mattmccutchen.net/clustering/>.
- 4/2008
- Presented a paper on matching of people to positions with one-sided preferences at LATIN 2008. See <http://mattmccutchen.net/lumc/>.
- 9/2005–present Contributing to **rsync** (<http://rsync.samba.org/>), a versatile open-source file-copying tool, and providing expert advice and clever solutions to users.
- 6/2006–8/2006 Javari project under Michael Ernst, MIT (Research Science Institute). Helped implement, tested, and evaluated a compiler and an inference tool for Javari, which consists of Java plus a reference immutability type qualifier.
- 8/2005–1/2006 Cyclone project under Michael Hicks, University of Maryland. Developed an Eclipse plug-in that helps Cyclone programmers optimize their code within Cyclone’s memory-safety rules by understanding its dataflow.
- 9/2007 Built a Web application to organize games for a group of tennis players at the University of Maryland.
- 3/2006 Wrote an article about the USA Computing Olympiad for Imagine magazine (<http://cty.jhu.edu/imagine/>).
- 12/2004–12/2005 Developer and system administrator, Montgomery Blair High School. Maintained the school’s Linux server and made significant enhancements to the online Blair Educational Network.
- 6/2005–8/2005, 6/2006 Developer, CharityWeb (provider of Web services for nonprofits). Overhauled email list software to personalize messages to donors.

EDUCATION

- 8/2007–present **University of Maryland, College Park.** Pursuing B.S. in computer science and math. University Honors Program, Banneker/Key scholarship. GPA 3.96 after fall 2009. Graduate courses include approximation algorithms (fall 2007), communication complexity (fall 2008), and software verification (spring 2009).
- 9/2003–5/2007 **Montgomery Blair High School Science, Math, Computer Science Magnet Program.** Unweighted GPA 3.99, weighted 4.86. Advanced courses include Analysis II, Advanced Geometry, Quantum Physics, Thermodynamics, Optics, Analysis of Algorithms, and Computer Graphics.
- 5/2005, 5/2006, 5/2007 5 on each of these AP exams: Calculus BC, Statistics, Computer Science AB, both Physics C, Chemistry, both Economics, English Language and Composition, World History, U.S. Government and Politics, Spanish Language, Music Theory.

9/2005–6/2006 Courses from Stanford University’s Education Program for Gifted Youth: Real Analysis (grade A), Complex Analysis (grade A), Modern Algebra (grade A+).

HONORS

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.**

5/2009 Pete Stewart Undergraduate Research Award from Computer Science Department, University of Maryland.

4/2009 Aziz Scholarship from Math 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.

2/2007–4/2007 Admitted to MIT, Caltech (Axline Scholarship), Harvard, and Carnegie Mellon (Carnegie Scholarship).

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.

SKILLS AND PROJECTS

Linux Outstanding problem-solving and scripting skills (bash, Perl). Solid understanding of “how things work” with particular depth in the POSIX API, filesystems, and security issues.

Java Expert. In addition to Javari and Cyclone work (above), wrote patches to Eclipse, a graphical object inspection tool, and a Fish Simulator for tag-and-release experimentation.

Web development Developed a sophisticated XSLT-based Web publishing system to maintain personal site (<http://mattmccutchen.net/>). Wrote tennis application and CharityWeb email list software (above) using Perl, Class::DBI, and Mason.

C++ Proficient. Wrote a Big Integer Library (<http://mattmccutchen.net/bigint/>) and algorithmic solutions to programming contest problems.

Haskell Developing the grant proposal matcher (above).

L^AT_EX Proficient. Typeset various documents including two published papers (above).

Eclipse Proficient with Java, C++, plug-in development, and CVS/SVN tools.

EXTRACURRICULAR ACTIVITIES

9/2007–present Member, University of Maryland Linux Users Group. Gave presentations about the git version control system and rsync (above).

1/2008–present 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.