

# Ryan Marcus

Los Alamos, NM  
505-500-4365  
ryan@rmarcus.info

## PROFILE

I am a Ph.D. student in computer science at Brandeis University. My research currently focuses on cloud databases and scheduling problems. I graduated with honors from the University of Arizona, where I took courses in computer science, gender and women's studies, and mathematics.

## EDUCATION

**Brandeis University, 2014 - now.** Ph.D. student in Computer Science.

- Big Data Analysis
- Abstract Algebra
- Statistical Machine Learning
- Database Systems
- Operating Systems
- Theory of Computation
- Artificial Intelligence
- Distributed Systems

**University of Arizona Honors College, 2010-2014.** Computer science, mathematics and gender studies.

- Compilers
- Databases
- Parallel Programming
- Object Oriented Programming
- Algorithms
- Symbolic Logic
- Analytic Geometry
- Discrete Math

## EXPERIENCE

**Brandeis University with Dr. Olga Papaemmanouil      2014 - now**

Researching cloud database systems, focus on applying machine learning algorithms to query scheduling as well as other classically hard problems.

**Los Alamos National Laboratory (HPC-5) with Cornell Wright      2014 - now**

Developed a framework for automatic performance analysis using machine learning to extract insights from hotspot profiles, MPI traces, and version control systems. Achieved a drastic reduction in memory usage in a large hydrodynamics code.

**The University of Arizona with Dr. Richard Snodgrass      2013-2014**

Worked on the AMELIE project, a toolkit to automatically generate casual models of database performance. I created the initial prototype and test suite.

**Los Alamos National Laboratory (AET-6) with Dr. William Ward      2013**

Worked on laboratory's 3D reconstruction code, RECON. Designed parallel versions of serial algorithms and implemented them on GPGPUs. Designed a novel, fast algorithm to approximate median filters. Improved the performance of RECON by a factor of three.

**The University of Arizona with Dr. Shaughan Lavine    2012-2013**

Developed novel Monte Carlo algorithm functional dependency discovery in large databases. We were able to optimize several production database schemas at the UofA.

**Los Alamos National Laboratory (XCP-3) with Dr. Larry Cox    2009-2012**

Worked on Los Alamos' premier Monte Carlo particle transport code, MCNP. Design exascale applications as well as working with a large Fortran project. Presented at SC10 and SC11.

**Arizona College Debate Team    2010-2014**

Competitive collegiate policy debate. Synthesized thousands of scholarly articles into succinct arguments. Advanced to the top 10%, participating at three national championships. Volunteer debate coach for Catalina Foothills High School.

**PAPERS**

Marcus, Ryan C. "Techniques for Automated Performance Analysis" LA-UR-14-26577, OSTI 1154980 ; 2014

Marcus, Ryan C ; Ward, William C. "DP: a Fast Median Filter Approximation" LA-UR-13-25331, OSTI 1088342 ; 2013

Marcus, Ryan C. "MCMini: Monte Carlo on GPGPU" LA-UR-12-23206, OSTI 1047072 ; 2012

Cox, Lawrence J ; Marcus, Ryan C. "Developing a Monte Carlo mini-app for exascale co-design" LA-UR-11-06085, OSTI 1074563 ; 2011

**PRESENTATIONS**

Marcus, Ryan C. "Machine Learning for Humans" for the Los Alamos National Laboratory Data Science Summer School ; 2015.

Marcus, Ryan C. "Shared Memory for Many-Core: A Hydrodynamics Case Study" for the Los Alamos National Laboratory Research Symposium, LA-UR-15-25303 ; 2015.

**POSTERS**

Marcus, Ryan C. "Matriarch: A Framework for Automated Performance Analysis" for the Los Alamos National Laboratory Research Symposium ; 2014.

**AWARDS**

- Codestellation Hackathon Judge's Pick for Pandat (Fall 15)
- Computer Science Outstanding Teaching Fellow Award (Fall 14/Spring 15)
- 3-Day Startup Challenge Winner (2015)
- Brandeis University Michtom Fellowship (2014)
- National Debate Scholar, Summa Cum Laude (2013)