Ryan Marcus

2172 Loma Linda
Los Alamos, NM 87544
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 GPUs. I graduated with honors from the University of Arizona with a degree in computer science and minors in mathematics and gender studies.

EDUCATION

University of Arizona, 2010-2014. Honors B.S. in Computer Science with minors in mathematics and gender studies.

- Compilers
- Databases
- Parallel programming

- Algorithms
- Symbolic logic

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

- Big Data analysis
- Abstract algebra

- Database design
- Operating systems

EXPERIENCE

Teaching Assistant at Brandeis University with Dr. Liuba Shrira - 2014
I worked on a team of six TAs to assist students, give review sessions, and grade assignments for a 102-person operating systems class in the fall of 2014. I received excellent marks on my evaluation report.

The University of Arizona with Dr. Richard Snodgrass   2013-2014
I wrote my undergraduate thesis with direction from Professor Snodgrass. I designed and implemented a suite of validation tools for AMELIE, a project that studies the intricacies of causal modeling. I have also been involved in planning the overall structure of the project, and I helped implement the first prototype.

Los Alamos National Laboratory with Dr. William Ward   2013
I worked with Dr. Ward on the laboratory's 3D reconstruction code, RECON. I designed parallel versions of many serial algorithms and implemented them on GPGPUs, and I designed a fast algorithm to approximate median filters. Overall, my work improved the performance of RECON by a factor of three.

The University of Arizona with Dr. Shaughan Lavine   2012-2013
Dr. Lavine and I developed a novel Monte Carlo algorithm for finding functional dependencies within large databases. We employed various HPC techniques to accelerate the algorithm, and we were able to optimize several production database schemas at the UofA.

Los Alamos National Laboratory with Dr. Larry Cox   2009-2012
I work with Dr. Cox on Los Alamos' premier Monte Carlo particle transport code, MCNP. My work includes co-design for exascale applications as well as working with a large Fortran project. Some of our work was presented at SC10 and SC11.

Arizona College Debate Team   2010-2013
I participated in competitive collegiate policy debate, which included synthesizing thousands of scholarly articles into succinct arguments. I advanced to the top 10% of all debaters, participating at three national championship tournaments. I also worked as a volunteer debate coach for Catalina Foothills High School.

PROJECTS
I have made a number of open source contributions, as well as a few personal projects, largely viewable on my GitHub.

- Parsing invalid JSON
- Connect Four AI

- DSL for DB execution plans
- Relational decomposition tools

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

Marcus, Ryan C. "HAWK: A Domain Specific Language for Expressing Scientific Models and a Tool for Testing AMELIE" approved honors thesis ; 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