

Shane McQuarrie

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<https://shanemcq18.github.io/Portfolio/>

Education

Master of Science, Mathematics *Brigham Young University*

April 2018

4.00/4.00 GPA

Thesis topic: data assimilation for mantle convection with Dr. Jared Whitehead

Coursework: theory of and modeling with ODEs and PDEs; numerical methods for linear algebra, ODEs, and PDEs; measure theory; functional analysis

Bachelor of Science, Mathematics *Brigham Young University*

June 2016

3.98/4.00 GPA, magna cum laude

Applied and Computational Mathematics Emphasis

- Strong experience with Python, including NumPy, SciPy, Matplotlib, Pandas, etc.
- Differential equations, dynamical systems, control theory, related numerical methods
- Probability theory, statistics, machine learning algorithms and techniques
- Algorithm design and complexity, including graph theory and related algorithms
- Optimization theory and methods (unconstrained, linear, convex, etc.)
- Classical analytic mathematics with emphasis on advanced linear algebra

Music Minor: three-time trumpet section leader of Synthesis, BYU's premier jazz ensemble

Computer Science Minor: proficient with bash, MATLAB, git; familiar with Java, C++, SQL

Spanish Language Certificate: Advanced level, ACTFL certified

Work Experience

Software Systems R&D Graduate Intern *Sandia National Laboratories*

2017

Automated data harvesting and processing, analyzed performance of various supervised learning algorithms, and researched various logical inference systems for a text classification project to reduce the substantial cost of sharing sensitive information

Developer, Manager, and Instructor *BYU ACME Development Team*

2014–Present

Contributed over 75,000 lines of revisions to programming curriculum; see <https://foundations-of-applied-mathematics.github.io> for the project
Managed several developers for final drafting of over 30 programming projects
Instructed four 40-student Python classes on data structures, optimization, tools for statistical analysis, and machine learning techniques
Devised over 30 test driver programs to automate the grading process
Designed websites and organized materials to administer the curriculum

Research Assistant *BYU Mathematics Department*

2013–2016

Knot theory with Dr. Jessica Purcell. Publication citation:

Bartholomew, P., McQuarrie, S., Purcell, J. S., & Weser, K. (2015).

“Volume and geometry of homogeneously adequate knots.”

Journal of Knot Theory and Its Ramifications, 24(08), 1550044.

Optimal heat flow through a rotating fluid with Dr. Jared Whitehead

Leadership and Service

Missionary *The Church of Jesus Christ of Latter-day Saints, Chicago*

2011–2013

Trained and mentored over 20 new volunteers in Spanish, goal setting, social and communication skills, and effective teaching paradigms

Eagle Scout *Boy Scouts of America*

2006

Earned 3 palms and over 40 merit badges

Organized the maintenance and restoration of the popular “Y” trailhead in Provo, UT