## Shane McQuarrie

https://shanemcq18.github.io/Portfolio/ shanemcq@utexas.edu (801) 318-3018 Education Ph.D., Computational Science, Engineering, and Mathematics The University of Texas 2022 M.S., Mathematics Brigham Young University 4.00/4.00 GPA 2018 Thesis topic: data assimilation in the Boussinesq approximation for mantle convection; final version available at <a href="https://scholarsarchive.byu.edu/etd/6951/">https://scholarsarchive.byu.edu/etd/6951/</a> B.S., Applied and Computational Mathematics Brigham Young University 3.98/4.00 GPA 2016 **Music Minor**: three-time trumpet section leader of Synthesis, BYU's premier jazz ensemble **Computer Science Minor**: experience with C++, Java, SQL, and C **Spanish Language Certificate**: advanced level, ACTFL certified Work Experience 2017 **Software Systems R&D Graduate Intern** Sandia National Laboratories Automated data harvesting and processing, analyzed performance of supervised learning algorithms, and researched 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 2014-2018 Top contributor to the project at <u>foundations-of-applied-mathematics.github.io</u> 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 a test driver framework to automate the grading process Designed websites and organized materials to deploy the curriculum 2013-2016 **Research Assistant** *BYU Mathematics Department* 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. Analysis of optimal heat flow through a rotating fluid with Dr. Jared Whitehead

## **Relevant Skills and Coursework**

## **Applied Mathematics and Engineering**

- Numerical analysis, including linear algebra and methods for differential equations
- Theory of ordinary and partial differential equations and mathematical modeling
- Fluid mechanics, electrodynamics, quantum mechanics, and statistical mechanics
- Probability theory, statistics, machine learning algorithms and techniques
- Optimization theory and methods for unconstrained, linear, and convex problems
- Real analysis, complex analysis, and functional analysis

## **Computer Programming**

- Strong experience with Python, including NumPy, SciPy, Matplotlib, pandas, etc.
- Proficient with bash, MATLAB, and git; familiar with Java, C++, SQL
- Algorithm design and complexity theory, including graph theory and search algorithms
- Data structures, databases logic, and large program design
- Program validation practices, including unit testing