Logan Schelly

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Objective

I am a recent graduate. My ultimate career goal would be to work on a project like Intel's Math Kernel Library. For the time being I am looking for an entry-level job in software, data, or (if possible) high performance computing.

Education

Bachelors of Science in Mathematics April 2020
Brigham Young University GPA: 3.17 out of 4.0

- Applied and Computational Mathematics Emphasis (ACME)
- Computer Science Minor
- Recognized for outstanding performance in Mathematics in 2020 and 2018

Course Work and Topics

- Fundamentals of Mathematics
  - Set Theory
  - Logic
  - Proof Techniques
  - Relations
  - Functions
  - Induction
  - Cardinality
  - Number Theory
- Linear Algebra
  - Solving Linear Systems
  - Matrix Algebra
  - Determinants
  - Vector Spaces
  - Eigenvectors
  - Inner Product Spaces
  - Quadratic Forms
  - Singular Value Decomposition
- Calculus of Several Variables
  - Quadric Surfaces
  - Vector Functions
  - Partial Derivatives
  - Multiple Integrals
  - Vector Calculus
- Differential Equations
  - First Order Differential Equations
  - Second Order Linear Differential Equations
  - Series Solutions of Second Order Equations
  - Laplace Transformation
  - Systems of First Order Linear Equations
  - Numerical Methods
- Theory of Analysis
  - Properites of the Real Numbers
  - Sequences and Series
  - Topology of $\mathbb{R}$
  - Limits and Continuity of Functions
  - Derivatives
  - Sequences and Series of Functions
  - Riemann Integration
- Mathematical Analysis
  - Abstract Vector Spaces
  - Linear Transformations and Matrices
  - Inner Product Spaces
  - Spectral Theory
  - Metric Space Topology
  - Fréchet Differentiation
  - Contraction Mappings
  - Daniell-Lebesgue Integration
  - Calculus on Manifolds
  - Complex Analysis
  - Spectral Calculus
  - Iterative Methods for Linear Systems
- Algorithm Design and Optimization
  - Measuring Algorithm Complexity
  - Data Structures
  - Combinatorial Optimization
  - Probability
  - Probabilistic Sampling and Estimation
  - Random Algorithms
  - Harmonic Analysis
  - Polynomial Approximation and Interpoloation
  - Unconstrained Optimization
  - Linear Optimization
  - Nonlinear Constrained Optimization
  - Convex Analysis and Optimization
  - Dynamic Optimization
  - Stochastic Dynamic Optimization
- Modeling with Uncertainty and Data
  - Markov Chains
  - Classical Inference
  - Hypothesis Testing
  - Regression and Classification
  - Bayesian Analysis
  - Estimation in State Space Models
  - Machine Learning
  - Unsupervised Methods
  - Graphical and Latent Variable Models
  - Kernel Methods
  - Tree-Based Methods
- Modeling with Dynamics and Control

- Existence and Uniqueness Theorem
- Stability Theory
- Bifurcation Theory
- Partial Differential Equations
- Calculus of Variations
- Euler's Equation
- Hamilton's Principle
- Noether's Theorem
- Optimal Control
- Pontryagin's Maximum Principle
- Linear Quadratic Regulators

Skills

Programming Languages

Python ——— Very Comfortable ——— used in 8 lab classes and 4 lecture classes

- NumPy
- Scipy
- Matplotlib
- SymPy
- Pandas
- scikit-learn
- pytest
- Selenium
- Beautiful Soup
- sqlite3

C ——— Proficient ——— used in 2 lecture classes

- `unistd.h`
- `signal.h`
- `pthread.h`
- `sys/socket.h`
- `omp.h` (OpenMP)
- `regex.h`

JavaScript ——— Beginner ——— self taught at javascript.info, and listed as a contributor

- JSON
- Mocha
- Chai

Java ——— Proficient, but rusty ——— used extensively in 1 lecture class

- GSON
- `java.sql`
- JUnit
- Android

C++ ——— Proficient, but rusty ——— used in 3 lecture classes

Other Tools

- LaTeX– Proficient
- Spreadsheets – Proficient
- Git – Intermediate
- HTML – Beginner

Soft Skills

Tutoring • Attention to Detail • Troubleshooting • Public Speaking • Leadership • Project Coordination

Work Experience

Head Upper Division Tutor — Provo, UT
BYU Math Lab — Sep 2014 – April 2020

- Helped students on a first-come first-served basis.
- Tutored Linear Algebra, Multivariable Calculus, Differential Equations, and Mathematical Proof classes.
- Conducted weekly meetings to help our team of 10-20 upper division tutors prepare for that week's concepts.
- Coordinated exam reviews, and often taught them. 10 to 200 students attended, depending on enrollment and subject.
- Overhauled the tutor handbook.
- Expanded the tutor application test to include a Mathematical Proof section.

Applied Math TA — Provo, UT
BYU Math Department — Winter 2019

- 3 times a week I held office hours to help ACME juniors with their Optimization and Mathematical Analysis homework.
- Usually helped between 5 and 10 students.

Lube Technician — Provo, UT
Jiffy Lube — Summers 2015 and 2016

- Serviced up to 50 cars each day.
- Changed oil, rotated tires, replaced brake pads, checked and filled under-hood fluids.
- Performed basic inspections for wear and tear.
- Repaired windshield rock chips.

Private Tutor — Hemet, CA
Self Employed — September 2012 – April 2014

- Tutored 6 different students individually. The students were in middle school and high school.

Gas Station Clerk — Idyllwild, CA
Idyllwild Garage — Summer 2011 and May 2012 – January 2013

- Depending on the shift, would open or close the store.
- Stocked shelves and updated inventory.

- Dispensed propane for customers with tanks.
- Serviced customers and kept the store clean.

Landscape Maintenance Crewmember — K&M Strategic Management
Hemet, CA — Summer 2011 and May 2012 – January 2013

- Leaf-blew the parking lots and picked up trash at managed medical properties every morning.
- Weeded, raked, and maintained the landscape at properties.
- Cleaned out an empty strip mall in preparation for sale.
- Repainted fences, parking lines, and breakrooms.

Projects

Math Lab Student Sign Up Analysis — Fall 2019 – Winter 2020

- Consolidated data spread across 60+ Excel files.
- Used Pandas to analyze the almost 900,000+ instances of students signing up for tutor help.
- Identified busiest times of the week, and the topics students most often came in for help with.
- Advised scheduling more tutors in the mornings based on my findings.

HTTP Proxy — Winter 2020

- Relayed user requests to end server, and relayed server responses to user.
- Used `regex.h` to verify that user requests met HTTP formatting requirements.
- Handled concurrent requests with a threadpool using `pthread.h` and `semaphore.h`.

DNS Stub Resolver — Winter 2020

- Program interfaced with DNS servers to look up IP addresses associated with a web domain name. For example, it would figure out that the domain name www.example.com is associated with IP address 93.184.216.34.
- Formatted queries to DNS standards, sent the queries with UDP, and then decoded responses.
- Written C with `unistd.h`, `sys/socket.h`, `arpa/inet.h`, and `netinet/in.h`.

OpenMP with Mandelbrot Set — Winter 2020

- Parallelized the Mandelbrot visualization code posted on github by Andrej Bauer.

Tiny Shell — Winter 2020

- Wrote a simple shell that could handle process creation, I/O redirection and pipelines, and process control.
- Used C with `unistd.h` and `signal.h`.

Inverted Pendulum Control — Winter 2019

- Modified the code from the CartPole-v1 environment of OpenAI's gym library.
- Updated from Euler's method to Runge-Kutta.
- Applied an LQR control scheme to keep the pendulum upright.

Android App – Family History Map — Summer 2018

- Wrote both the client and server in Java.
- Displayed family history data with a Google MapFragment.
- Implemented activities for log-in, map interaction, life event details, and app settings.
- Wrote the SQL commands that the server would use to store and retrieve user data.