Alexander Williams

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Saint Paul, MN

Experience

- **BetterYou** — Saint Paul, MN
  Backend Software Engineer — *Sept. 2020 – Present*
  - **Backend Scaling and Restructuring**: Expanding and refactoring a serverless Node.js GCP backend serving thousands of users on iOS, Android, and web. Architecting ETL pipelines with Big Query.
- **Valence Life Sciences** — New York City, NY
  Webmaster, Frontend Engineer (from May 2020) - part time — *Apr. 2018 – Aug. 2020*
  - **Company Website Development & Maintenance**: Built websites in modern React. Identified, diagnosed, and fixed website issues and errors, worked with key stakeholders on design. Reduced company hosting costs by 99%. Improved UI and used SEO to increase site traffic 300% over two years.
- **Northeastern University Mathematics Department** — Boston, Massachusetts
  Algorithmic Researcher — *Feb. 2019 – Jan. 2020*
  - **Research**: Studied high-dimension complex analytic singularities using Python, Sage MATH and Singular, leveraged operator-controlled pseudorandom generation via a multistage stochastic Markov chain process.
  - **Beta Invariant Determination Algorithm**: Discovered infinite family of polynomials with negative Lê cycles, created the first algorithm capable of finding beta invariants. Decreased solving time in 3 - 5 dimensions from on average 10 minutes to 5 seconds, reducing skilled labor requirement by over 99%.
  - **Large Scale Parallel Computation**: Parallelized algorithm using both a Bash script and a GNU parallel implementation. Increased local polynomial sampling size by more than 10000x, allowing for more sophisticated analysis at scale. Deployed algorithm remotely via a Slurm job array on a centOS computing cluster allowing for billion point sampling.
- **Code for America, Boston Brigade** — Boston, Massachusetts
  Data Analyst — *Mar. 2019 – Apr. 2019*
  - **EPA Data Analysis**: Worked with a remote GCP SQLite database liaising to the EPA's water quality database to analyze multi-billion point datasets and derive insights into water quality in the US.
  - **Data Visualization**: Created dynamic data visualizations in Power BI to indicate trends and contaminant hot spots and supported data scientist algorithm design efforts.

Education

- **Flatiron School** — New York City, New York
  Full Stack Software Engineering — *Nov. 2019 – Mar. 2020*
- **Northeastern University** — Boston, Massachussetts
  Computer Engineering, Math & Physics - 83 credits completed, dropped out. — *Sept. 2018 – Apr. 2019*
- **Bard Queens** — New York City, New York
  AA degree completed during high school. Took OOP and Python with Linear Algebra. — *Sept. 2014 – Jul. 2018*

Selected Projects

- **Cruze - HackNYU 2020 Winner**: Created a custom routing algorithm which utilized local bike infrastructure data to increase cyclist safety using weighted routes determined via imported data from NYC Open Data and utilized ArcGIS' REST API. Won 1st Place Health & Sustainability and Best Sports Hack. Link to project page.
- **DirExit - DragonHacks 2020 Winner**: Created a raspberry-pi fire exit sign, intelligently routing evacuees to unblocked exits. Designed pathing with backtracking and lossy compression algorithms in Python, worked on final product integration and visualization. Won 1st Place Overall and Best Data Analysis & Visualization. Link to project page.
- **Chat App - Flatiron School Final Project**: Built a Slack-like chat application, which allows users to create channels and talk with other registered friends. Used Ruby on Rails and Action Cable for a live-capable backend and React and Electron for frontend. Link to backend, link to frontend.

Selected Skills

- **Languages**: Javascript, Python, Ruby, SQL **Technologies**: React, Node, Flask, Rails, GCP, noSQL