Keith F. Ma

keithfma@gmail.com | *610-389-1406* | *github.com/keithfma* | *linkedin.com/in/keithfma* | *allnans.com*

Software engineer with 10 years experience translating cutting-edge research into practical software and a strong background in science and ML. Looking to build tools that make hard tasks easy and the world a better place.

Skills

Languages Python, Javascript, SQL, Shell, C, Fortran, MATLAB, R
Tools AWS, Airflow, Docker, Postgres/PostGIS, SQLAlchemy, Alembic, pytest, CircleCI, Celery, Flask
Science SciPy/NumPy, pandas/geopandas, GDAL/OGR

Experience

Indigo Ag *Boston, MA*
Staff Software Engineer *March 2023 - Present*

- Led engineering for life cycle analysis Python library that estimates CO_2 emissions for cash crops via input-output modeling. Includes a novel method for preprocessing model uncertainty that is currently in the patent application process.
- Improved team performance and built internal alignment by mentoring junior engineers, sharing knowledge with peers, and collaborating with science and product teams on requirements, milestones, and prioritization.

Senior Software Engineer *Jan. 2019 - March 2023*

- Developed data remediation service for a system that estimates soil organic carbon over time for >10k fields in the US, leading to >130k tons CO_2 sequestered so far (patent) . Integrates ML inferences, statistical reports, and subject matter expertise to identify missing/erroneous data and patch it with scientifically-defensible synthetic data. Designed and tested in collaboration with science and policy teams.
- Built tools for satellite imagery visualization and analysis, including field boundary detection (patent) and an on-demand image tiling service for interactive visualization of the latest 20m/pixel resolution imagery in Indigo's web applications with a 100ms response time (patent) .

TellusLabs (acquired by Indigo Ag) *Somerville, MA*
Software Engineer *Aug. 2018 - Jan. 2019*

- Core developer for a global satellite analytics platform predicting agricultural yields from field- to national-scale

Insight Data Science *Boston, MA*
Data Science Fellow *June 2018 - Present*

- Built an MVP navigation app that optimizes for comfortable outdoor travel in sun or shade by simulating sunlight along potential routes from dense LiDAR points and the OpenStreetMap graph

Boston Fusion Corp *Lexington, MA*
Research Scientist *June 2016 - May 2018*

- Created ML-based analytical tools to address a wide range of Department of Defense needs, including adaptive decision support systems, data exploration via multi-level graphs, and AI for interactive training games

Boston University Research Computing Services *Boston, MA*
Scientific Programmer / Analyst *Sept. 2014 - June 2016*

- Consulted with faculty and students to optimize and parallelize research software for an >18k core computing cluster

Yale University Department of Geology & Geophysics *New Haven, CT*
Doctoral Candidate *Sept. 2007 - Sept. 2014*

- Designed and built a distributed numerical model to simulate erosion by rivers and glaciers
- Created a method for reconstructing past topography by decomposing and scaling modern topographic features

Education

Yale University *New Haven, CT*
M.Phil in Geology & Geophysics *Dec. 2009*

Brown University *Providence RI*
BA in Geology - Biology *May 2005*