

Keith F. Ma

keithfma@gmail.com | 610-389-1406 | Hanover, NH | github.com/keithfma | linkedin.com/in/keithfma

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, C, Fortran, Shell, SQL, MATLAB

Tools AWS, Airflow, PostGIS, Docker, CircleCI, GDAL/OGR, scipy, SQLAlchemy, celery, flask

Experience

Indigo Ag

Boston, MA

STAFF SOFTWARE ENGINEER

March 2023 - Present

- Led engineering for life cycle analysis library that applies input-output modeling to estimate cash crop CO₂ emissions from farmer actions and materials used. 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 CO₂ 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
- Built a physical model of mountain formation and software for measuring velocity fields from experiment imagery

Education

Yale University

New Haven, CT

M. PHIL IN GEOLOGY & GEOPHYSICS

Dec. 2009

Brown University

Providence RI

BA IN GEOLOGY - BIOLOGY

May 2005