

DAVID FADEN

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<https://github.com/fadend>

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COMPUTER SKILLS:

Operating Systems: Mac OS X, Linux

Main languages: C++, Python

Also: Go, Java, JavaScript, SQL, R, PHP

WORK EXPERIENCE:

Calscape

Volunteer, Software Engineer

July 2024 - present

Made numerous improvements to calscape.org including allowing filtering by availability in specific nurseries (UX + backend) and finding all plants within the boundaries of a city. Created tool to update plants within county and subregions (along with city), notably increasing coverage. Refactored search, notably reducing code duplication, extended regression tests, and added the first unit tests for the site. Created onboarding docs for other volunteers.

Programmed in PHP, SQL, JavaScript, Python, and R.

Google

Search, Software Engineer

January 2015 - March 2024, Mountain View, California

I worked on a variety of teams, all in Search: Spelling, Discover, Growth. This work aimed ultimately at improving the quality of users' experiences with Search and related products.

Some of my roles and work there:

- Machine learning engineer. Fit multiple deep learning models (Keras + TensorFlow in Python) used for reranking the suggestions you get clicking on the search results box, leading to multiple launches with positive metrics (CTR, DAU, etc.), collaborating with DeepMind. Iterated on these both through offline evaluations and online experiments. Python and R for analysis/data visualization. Maintained and extended data generation pipelines (Python, Go, C++, Java).
- Tech lead for quality side of a promo on the mobile search results page to install a homescreen shortcut. We experimented with numerous machine learning models and modeling approaches for making triggering decisions, built new logs processing pipelines (Go, C++) to generate signals used in those models and made changes throughout the stack (C++, Java, JavaScript/TypeScript) to support those models. Drove multiple launches for the system with positive metrics (CTR, DAU, etc.).
- Tech lead for survey generation platform, working with dozens of internal clients. Maintained and extended C++ and Python + Django servers. Coordinated with privacy team. Built multiple other systems and tools related to evaluating quality.

- Co-hosted interns who built new system to scrape and display history of Discover cards for virtual user profiles. Got them to work in C++, Python + Django, and GoogleSQL.
- Improved gesture typing in Android Google app. Defined the interfaces between some components that needed to communicate and implemented it in parallel with partner teams. Wrote Android Java code.
- Created pipeline (C++ MapReduce) to produce signals to identify bad spelling suggestions. Launch notably improved spell suggest quality in Google Docs and Chrome.

Google

Search Quality, Decision Support Engineering Analyst

July 2008 - December 2014, Mountain View, California

Consulted with engineers and evaluated proposed changes to the search engine using human ratings and live traffic A/B test data. Presented reports weekly to Google search leads, writing over 300 launch reports. Designed new surveys. Carried out analyses using R and SQL. Wrote utilities in Python and JavaScript. Added erf and erfc to Google calculator onebox.

Iowa State Department of Statistics

Research Assistant

September 2007 - May 2008, Ames, Iowa

Helped with several projects including one aimed at estimating the noise parameter from MRI data. Extended a multistage clustering algorithm to handle mixtures of Rice distributions. Used C for implementation and R for prototyping, analysis, and display.

Fachbereich Statistik, Universität Dortmund

HiWi (Research Assistant)

November 2006 - July 2007, Dortmund, Germany

Modified existing C++ code, a collection of robust time series methods, to allow it to be called cleanly within R. Under the direction of the German researchers, extended the algorithms to handle missing values and weights. Assisted other groups with C++ and R coding.

Iowa State Department of Statistics

Research Assistant

January 2005 - July 2006, Ames, Iowa

Investigated the properties of screwdriver scratches collected by our collaborators in mechanical engineering. Explored matching algorithms based on these using C++ with an eye towards forensics applications.

University of Iowa Department of Physics and Astronomy

Programmer

November 2004 - January 2005, Ames, Iowa

Helped develop a program to manage a database of physics articles. Used Java for the GUI and (XML) database management and Perl to fetch the citations and articles.

Iowa State Academic Success Center

Tutor

October 2004 - December 2004, Ames, Iowa

Tutored five students in computer science courses covering beginning programming and data structures (C++), discrete math, and basic Unix commands amongst other topics.

Iowa State Department of Physics and Astronomy

Research Assistant

June 2000 - June 2004, Ames, Iowa

Worked with the ISU contingent of the PHENIX Group of Brookhaven's Relativistic Heavy Ion Collider. Wrote C++ macros and classes to display collider data using CERN's ROOT, an object-oriented data analysis framework.

PATENTS:

[Predicting user needs for a particular context](#) (filed 2018, granted 2020)

[Identification and issuance of repeatable queries](#) (filed 2019, granted 2024)

PUBLICATIONS:

R. Maitra and D. Faden, "Noise Estimation in Magnitude MR Datasets," in IEEE Transactions on Medical Imaging, vol. 28, no. 10, pp. 1615-1622, Oct. 2009, doi: 10.1109/TMI.2009.2024415

Faden D, Kidd J, Chumbley LS, Morris MD, Genalo L, Kreiser J, et al. Statistical confirmation of empirical observations concerning tool mark striae. AFTE J 2007; 39(3): 205–14.

Chumbley L. S. , Morris Max D. , Kreiser M. James , Fisher Charles , Craft Jeremy , Genalo Lawrence J. , Davis Stephen , Faden David , Kidd Julie . [Validation of tool mark comparisons obtained using a quantitative, comparative, statistical algorithm](#). Journal of Forensic Sciences, 55(4):953–961, July 2010.

EDUCATION:

Iowa State University, Ames, Iowa

Major: Statistics

Master of Science (incomplete -- all but final project)

Iowa State University, Ames, Iowa

Major: Computer Science

Minors: Mathematics and Philosophy

Bachelor of Science: May 2004