

work history

principal engineer: [performance star](#)

2019 -

analysis and fault detection for semiconductor manufacturing machines. wavelets, genetic programming, recurrent neural nets, probabilistic programming, gaussian processes, autograd. lots of reading and implementing ideas in research papers. (python, torch, java, keras, numpy, pandas, sklearn)

data scientist: [facebook](#)

2018 - 2019

worked with the world.ai team to ingest and digest open street map diffs. helped create accurate population density maps of africa combining census data and satellite imagery (python, presto, giraph, hadoop, hive, gluster, C++, java, javascript)

senior staff engineer: [iqvia](#)

2017 - 2018

built general diagram of things charting engine with arbitrary depth axis-aligned recursively nested, interactive, animated charts. chart components and databinding specified by an xml-based markup language used by a team of 100+ engineers in india to build client specific applications (C#, javascript)

cto, co-founder: [lbd data](#)

2008 - 2018

built a suite of mobile video software for [police](#) and [public transit](#). the suite is used throughout the united states. (C#, winforms, wpf, libavcodec, openstreetmap, opencv, amazon s3, dynamodb, sql, javascript, html5, C++)

adjunct assistant professor, mathematics: franklin & marshall college

2014 - 2017

taught math!

senior software engineer: markit on demand

2010 - 2011

optimized middleware supporting hundreds of developers (C#, C++)

kernel engineer: [synaptics](#)

2009 - 2010

improved reliability of [touchpad driver](#) (C++)

software engineer: markit on demand

2007 - 2009

charts, reports, and tools for the financial services industry (C#, C++, html5, javascript)

scientific programmer: titan national security

2006 - 2007

created software to model the effects of electromagnetic pulses on military systems (C++, C#)

education

phd, mathematics: arizona state university

2011 - 2013

◦ research: discrete math, combinatorics, graph coloring, games and algorithms

ma, mathematics: uc santa barbara

2003 - 2005

ba, mathematics: washington university in st. louis

1999 - 2003

research, etc.

◦ [erdős number 2](#)

2011 - ∞

◦ 30+ [publications](#) in top-tier discrete mathematics and philosophy journals

2006 - 2020

◦ 1st place, mentor graphics state programming competition

1997 and 1998

◦ developed [betsy](#), a strong chess AI, in C and x86 assembly

1998 - 2003

◦ built tesla coils and produced massive lightning bolts

1997 - 1999