

# Joseph Knox

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## EDUCATION

### UNIVERSITY OF WASHINGTON

#### M.S. IN APPLIED MATHEMATICS

June 2018 | Seattle, WA

### UNIVERSITY OF WASHINGTON

#### B.S. IN INDUSTRIAL ENGINEERING

Minor in Applied Mathematics

June 2016 | Seattle, WA

## SKILLS

### TECHNICAL

**Languages:** C++ • Go • Python • JS • PHP

**JS libs:** React • Relay • GraphQL

**ML libs:** SkLearn • XGBoost • PyTorch

**DB (SQL):** Presto • Hive • MySQL • Spark

**Systems:** Linux (Arch, Debian) • Docker

## OPEN SOURCE

### MCMODELS | MAINTAINER

2017 – 2018 | Python

Python library for mesoscopic full-brain connectivity models in mouse – built on top of the AllenSDK and Scikit-Learn APIs.

### RISTRETTO | PRIMARY CONTRIBUTOR

2018 | Python

Randomized matrix factorization library written in Python (numpy).

### CONTRIBUTOR TO

- Allensdk
- Scikit-learn

## COURSEWORK

### GRADUATE

Statistical Computing

Combinatorial Optimization

Computational Neuroscience

Statistical Analysis of Social Networks

Computational Methods - Data Analysis

### UNDERGRADUATE

Machine Learning

Stochastic Modeling/Decision Analysis

Linear and Network Programming

High-Performance Scientific Computing

## SUMMARY

I am a Software Engineer working on building infrastructure & tools for language models. Previously I worked as a Data Scientist in both research & in industry. Throughout my diverse work experience, I have identified, communicated, and solved problems in close collaboration with cross-functional partners.

## EXPERIENCE

### FACEBOOK

Aug 2020 - Present • 2 yr

### SOFTWARE ENGINEER

Remote | London, UK

- Enable end-to-end testing of voice assistant features: achieve two 9's reliability for test runner service, with capacity to run millions of tests daily.
- Designed & built an tool for language modeling experts through close collaboration with cross functional partners & by managing 2 people

### FACEBOOK

Sept 2018 - Aug 2020 • 2 yr

### DATA SCIENTIST

San Francisco, CA

- Own analytic strategy focused on Instagram SMB advertiser value
- Identify product gaps and market opportunities, working with many cross-functional partners to influence product and marketing roadmaps
- Build end-to-end ML models to predict advertiser churn and retention lift
- Build and contribute to internal tools streamlining data visualization, ML modeling, and experimentation measurement
- Write data pipelines to support analysis, internal tools, and external personalized marketing campaigns

### ALLEN INSTITUTE FOR BRAIN SCIENCE

June 2017 - Sept 2018 • 1 yr 4 mos

### DATA ANALYST

Seattle, WA

- Develop and implement novel models for full-brain connectivity
- Analyze heterogeneous, multi-scale experimental data
- Contribute to organizational open source software packages
- Research statistical, graph theoretic models of brain connectivity

### RATLAB LLC

July 2016 - Jan 2017 • 7 mos

### RESEARCH INTERN

Seattle, WA

- Designed and conducted experiments for product R&D
- Optimized hardware design through the use of statistical ML techniques

## SELECT PUBLICATIONS

- [1] J. A. Harris, S. Mihalas, et al. Hierarchical organization of cortical and thalamic connectivity. *Nature*, 575(7781):195–202, 2019.
- [2] J. E. Knox, K. D. Harris, et al. High-resolution data-driven model of the mouse connectome. *Network Neuroscience*, 3(1):217–236, 2019.
- [3] J. D. Whitesell et al. Whole brain imaging reveals distinct spatial patterns of amyloid beta deposition in three mouse models of alzheimer's disease. *Journal of Comparative Neurology*, 527(13):2122–2145, 2019.