

# ALEXANDER LENAIL

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## EDUCATION | MIT, PhD, COMPUTATIONAL SYSTEMS BIOLOGY

FALL 2019 – PRESENT

Jointly advised by Alan Edelman and Jonathan Weissman

## TUFTS UNIVERSITY, B.S. COMPUTER SCIENCE

FALL 2012 – SPRING 2016

Concentrations: Machine Learning, Web Engineering, Computational Biology.

## MIT, VISITING STUDENT

SPRING / FALL 2015

## PALO ALTO HIGH SCHOOL, 2012

## WORK EXPERIENCES | GOOGLE BRAIN GENOMICS RESEARCH INTERN

SUMMER 2019

Gene Regulatory Network Inference and Visualization.

## MIT BIOLOGICAL ENGINEERING – FRAENKEL LAB COMPUTATIONAL RESEARCH ASSOCIATE

FEBRUARY 2016 – MAY 2019

Building computational infrastructure for AnswerALS & NeuroLINCS consortia locally and on the cloud.

Azure, Docker, Galaxy, Cromwell, SLURM, k8s.

Research projects on

- computational/ML methods for the integration of 'omics data. Jupyter, numpy, pandas, scikit-learn, tensorflow.
- the mechanisms of neurodegeneration in ALS and ALD. GO, Pathway databases, PPIs, GRNs.
- visualization of gene expression datasets with D3.

## BENCHLING SOFTWARE ENGINEERING INTERN

WINTER 2015-2016

Building out synthetic biologist's online lab notebook in React, Flask with SQLAlchemy.

## GOOGLE SEARCH SOFTWARE ENGINEERING INTERN

SUMMER 2015

Developed an extensible classifier framework to recognize spam URL patterns in the crawl.

C++ template programming, MapReduce, AdaBoost. Machine Learning at web scale.

## TUFTS CS – SLONIM LAB BIOINFORMATICS TA & RA

FALL 2014

## COURSERA – KPCB ENGINEERING FELLOW SOFTWARE ENGINEERING INTERN

SUMMER 2014

Building out the Coursera platform in Scala and Javascript with Backbone.

## AUTODESK SOFTWARE ENGINEERING INTERN

SUMMER 2013

Building frontend for architecture-CAD tool 'FormIt Web'. CoffeeScript with Scene.JS / WebGL.

## STANFORD GSB – SOULE LAB RESEARCH ASSISTANT

SUMMER 2012

## PUBLICATIONS | Axial: Interactive Visualizations for High Dimensional Genomics Data

Manuscript in preparation

Transcriptional Profiling of Human Brain Endothelial Cells Reveals Key Pathways Underlying Cerebral X-Linked Adrenoleukodystrophy

Manuscript in preparation

An integrated multi-omic analysis of molecular changes in iPSC derived motor neurons from ALS patients harboring the C9ORF72 mutation

Submitted

NN-SVG: Publication-Ready Neural Network Architecture Schematics

Alexander LeNail

The Journal of Open Source Software (JOSS)

January 2019

### Shallow Sparsely-Connected Autoencoders for Gene Set Projection

Maxwell P. Gold, **Alexander LeNail**, Ernest Fraenkel  
Pacific Symposium of Biocomputing 24 (PSB)  
January 2019

### Proteomics, Post-translational Modifications, and Integrative Analyses Reveal Molecular Heterogeneity within Medulloblastoma Subgroups

Contributing author  
**Cancer Cell** Volume 34, Issue 3  
September 2018

### Genome-wide Analyses Identify KIF5A as a Novel ALS Gene

Contributing author  
**Neuron** Volume 97, Issue 6,  
March 2018

### The Library of Integrated Network-Based Cellular Signatures NIH Program: System-Level Cataloging of Human Cells Response to Perturbations

Contributing author  
**Cell Systems** Volume 6, Issue 1  
January 2018

### Graph-Sparse Logistic Regression

**Alexander LeNail**, Ludwig Schmidt, Jonathan Li, Tobias Ehrenberger, Karen Sachs, Stefanie Jegelka, Ernest Fraenkel  
Neural Information Processing Systems - Discrete Structures in Machine Learning workshop (NIPS DISCML)  
December 2017

### A Fast Prize-Collecting Steiner Forest Algorithm for Functional Analyses in Biological Networks

Murodzhon Akhmedov, **Alexander LeNail**, Francesco Bertoni, Ivo Kwee, Ernest Fraenkel, Roberto Montemanni  
International Conference on AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CPAIOR)  
April 2017