

JACOB D KROL

Computational Biologist ~ Software Engineer

🌐 Lab website

🐙 github.com/jakekrol

📍 Denver, Colorado

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SUMMARY

A scientific programmer specializing in machine learning (ML) with significant experience in front and back-end web development, High Performance Computing (HPC), and devops.

SKILLS

Languages: R, Python, Bash/Shell, JavaScript, HTML, Perl, C, Java.

Technologies: Git, GitHub, PyTorch, Scikit-learn, Slurm (HPC), PBS Torque (HPC), tidymodels, numpy, tidyverse, matplotlib, ggplot2, R Shiny, Docker, Singularity, LaTeX, SQL.

PROJECTS

R,Shiny,Docker,
Slurm,Bash

MolEvolVR: web-app for protein characterization via molecular evolution

🐙 jrvilab/molevolvr1.0

Frontend, backend, and devops for the application. Co-primary first author publication.

R,Docker

amR: R package for bacterial drug-resistance classification (ML) models

🐙 jrvilab/amR

R data files for drug resistance classification models, feature engineered omics datasets (training data) with supporting classes and functions. Publication in-prep.

Python,Docker,CLI

Aibou: a python package for a turn-based, quick-time-event, CLI game

🐙 jakekrol/aibou

A monster battle game a CLI user-interface and AI to play against. Quick time key press events are good dexterity training! Hosted on PyPI; installable via pip.

R,Shiny

Company website for Krol Building

🐙 jakekrol/kRol_building

Image showcase, mission statements, and contact information for Krol Building Company. Deployed to shinyapps.io free hosting platform.

EDUCATION

9/2023 - 12/2023

Graduate (non-degree seeking) 4.0/4.0

University of Colorado Anschutz Medical Campus

BIOS 7747: Machine Learning for Biomedical Applications, graduate course offered by the Colorado School of Public Health (funded by employee benefits)

9/2020 - 8/2022

Bachelor of Science, Neuroscience 3.89/4.0

Michigan State University

Undergraduate research experience. Notable coursework: neural engineering, cognitive science, linguistics, genetics, statistics

9/2017 - 5/2020

Math and Science transfer program 3.52/4.0

Washtenaw Community College

Notable coursework: Java programming, calculus

11/2023 - present

Mathematics for Machine Learning Specialization (certificate)

Coursera

Three course specialization: linear algebra, multivariate calculus, and principle component analysis (PCA). Free registration as CU Anschutz employee.

EXPERIENCE

11/2022 - present

Information Sciences Professional

University of Colorado School of Anschutz School of Medicine

- Machine learning prediction and statistical inference of drug-resistance across bacterial pathogens
 - Extensive hyperparameter tuning, model performance evaluation, and model selection to build ensemble classification models for drug classes.
 - Developed and containerized a feature engineering pipeline (annotation, clustering, and pangenomics) for genomic sequences and executed on HPC to generate training data from thousands of bacterial isolates.
- R / Python / Bash / Docker / Git / Shiny / HPC / Slurm

5/2022 - 11/2022

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Michigan State University

- Developed machine learning models to predict plant virus hosts' and taxonomy using omics data.
 - Feature engineering omics datasets and statistical inference of features: Fisher's exact and Principle Component Analysis
- Python / Scikit-learn / Pandas / Numpy / Matplotlib / Jupyter

MACHINE LEARNING EXPERIENCE

convolutional neural networks, artificial neural networks, random forests, logistic regression, gradient boosting machines, adaboost, k-nearest-neighbors, OPTICS, DBSCAN, hierarchical clustering, k-means, linear/non-linear regression