

Julia Cluceru

A UCSF Ph.D. student in Bioengineering/Pharmaceutical Science focused on machine learning + deep learning applications in imaging. Seeking machine learning internship opportunities for Summer 2020.

Projects + Research

Machine learning in MRI to diagnose brain tumor patients — *University of California, San Francisco*

Spring 2017 – Present (San Francisco, CA)

Goal: Identify the presence of inflammatory treatment injury that mimics the appearance of a recurrent tumor

- Create convolutional neural networks (CNNs) to distinguish between the recurrence of a brain tumor and the inflammatory response induced by treatment
- Discovered a novel MRI biomarker that can predict the outcome of tissue samples in recurrent tumor patients using generalized estimating equations and logistic regression. Resulted in 71% cross-validation accuracy (*publication pending*)
- Created two end-to-end MRI processing pipelines for both lesion-level patient images and tissue-sample patient data, including quality control visualization GUIs; many pieces of these pipelines re-used by members of my lab

Comparing radiomics to CNN for MRI contrast detection — *University of California, San Francisco*

Fall 2018 – Present (San Francisco, CA)

Goal: Automate the retrieval + alignment of images with the same anatomy + contrast for longitudinal lesion analysis

- Extract radiomics data (quantitative imaging features) and MRI metadata as features to input for support vector classification of MRI anatomy + MRI contrast
- Create CNN experiments using both MR images and metadata scalar features to classify MRI anatomy + MRI contrast resulting in 99% accuracy (anatomical classification; 2 classes); 96.4% accuracy (MRI contrast classification, 8 classes)
- Created a command line tool to reproducibly create stratified training and testing splits of brain MRI exam cohorts for seamless integration into the pytorch workflow

Evaluating microfinance loan candidacy — *University of California, Berkeley*

Summer 2019 (Berkeley, CA)

Goal: Predict whether an individual would be suitable for microfinance loans based on financial history

- Created a Gradient Boosting Machine that predicted loan payer status with 71% accuracy and 0.6 AUC ROC
- Amassed household and personal predictors from 10 disparate datasets (e.g. consumption habits, education)
- Used github for working collaboratively with group members to agglomerate over 400,000 disparate financial transactions into a score representing credit

Teaching

Science and mathematics tutor

Spring 2007 – Present (Stamford, CT; Chapel Hill, NC; Madrid, Spain; San Francisco, CA)

- Math: Algebra I & II, Geometry, Trigonometry, AP Calculus AB/BC, SAT/ACT/GRE Math, SSAT/HSPT
- Science: AP Chemistry, AP Biology, AP Physics, MCAT

Drugs of the Central Nervous System — *Teaching Assistant*

Spring 2017 (San Francisco, CA)

Education

University of California, San Francisco — *Ph.D. in Bioengineering/Pharmaceutical Sciences*

Fall 2015 - (exp.) Fall 2020 (San Francisco, CA)

University of North Carolina, Chapel Hill — *B.A., Mathematics; B.A. Chemistry*

Fall 2009 - Spring 2013 (Chapel Hill, NC) - Graduated with Distinction

Skills

- Python data science stack, Pytorch, R, bash scripting, git, jupyter