

Julia Cluceru

A Ph.D. level bioengineer focused on deep learning applications in imaging. I have a strong theoretical and applied background in machine learning and statistical analysis. I am seeking internship opportunities for 2019-20.

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

Pytorch, Image processing, Pandas, Numpy, Scikit-learn, OpenCV, R, bash scripting, git, jupyter; learning Tensorflow + SQL

Projects and Research

Developing tools to diagnose brain tumors using MRI — *UC San Francisco*

Spring 2017 – Present

Goal: Identify treatment damage that mimics the appearance of a brain tumor to diagnose patients and plan treatment

- Distinguished between real recurrence of a brain tumor and the damage induced by treatment using convolutional neural networks (CNNs) ([progress](#))
- Discovered a novel marker that can predict the outcome of tissue samples in recurrent tumor patients using repeated-measures statistics and logistic regression (*publication submitted*) ([progress](#))
- Programmed multiple end-to-end python-based image processing pipelines including quality control visualization. Pipeline adoption by lab members saving ~2 hours of processing per patient group.

Automating the retrieval of relevant images for doctors — *UC San Francisco*

Fall 2018 – Present

Goal: Create a web-based application for neurologists that automatically classifies, retrieves + aligns unlabeled images of interest to assess disease progression over time

- Used support vector classifiers on features derived from image-associated metadata to understand baselines
- Designed two-step classification experiments to 1) classify brain images (0.97 AUC); and 2) classify MRI contrast of brains resulting in 96.4% accuracy (6 well-balanced classes) using CNNs + random forests ([progress](#))
- Developed a command line tool to create reproducible stratified training and testing splits of brain MRI exam cohorts for seamless integration into the pytorch workflow
- Deployed algorithms into the UCSF Neurology clinic to display the correct images of patients' brains with other clinical metrics over time, serving 15 clinicians with ~1000 projected patient visits per year (~10k MRI exams/year)

Stratifying brain tumor patients into genetic subtypes — *UC San Francisco*

Summer 2019 – Present

Goal: Group patients into one of three major genetic brain tumor subtypes in order to evaluate their candidacy for different chemotherapies

- Classified patients into genetic subtypes with 91% validation accuracy using CNNs ([progress](#))
- Successfully repurposed my MRI processing pipeline developed above for all images in this analysis

Evaluating microfinance loan candidacy — *UC Berkeley*

Summer 2019

Goal: Predict whether an individual would be suitable for microfinance loans based on financial history ([code](#))

- Used exploratory data analysis techniques to visualize correlations among the feature set comprised of 10 datasets describing human demographics and general financial information
 - Transformed 400,000 disparate financial transactions into both binary and continuous scores representing credit
 - Predicted credit score with gradient boosting machines, providing insight into the most important features related to loan payer status
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Notable accomplishments

- *Invited Speaker*, Society for Neuro-Oncology, Phoenix, AZ. Nov 2019
- Ruth L. Kirschstein T32 NIH Training Grant, \$49,140 total award
- Diversity Scholarship, \$5,000 total award, USF Deep Learning Part I & II
- Posters linked [here](#)
- 1st place, Best Student Speaker. AAPS Annual Meeting. Mar 2018
- 1st place, Best Poster. UCSF Radiology Symposium. Mar 2019
- Co-founder, UCSF Graduate Data Science Organization. Dec 2019
- Science + mathematics tutor for >10 years (SAT, ACT, APs)