

Daniel Yao

(608) 738-6047 | dyao13@jh.edu | github.com/dyao13

Education

Johns Hopkins University

B.S. Applied Mathematics and Statistics, B.S. Computer Science
4.00 GPA, 36 ACT, 1590 SAT

Baltimore, MD

Expected May 2027

Relevant Coursework

Mathematics: Probability, Mathematical Statistics, Optimization, Numerical Methods, Multivariate Calculus, Linear Algebra, Differential Equations

Computer Science: Data Structures, Algorithms

Unofficial Transcript: github.com/dyao13/CV/blob/main/transcript/yao_transcript.pdf

Abstracts

Liu, S., Sargent C., Broman L., **Yao, D.** (2024). Role of CRF1 and CRF2 Receptors in Stress-induced Increase in Intestinal Permeability in the Mouse Colon. *Physiology* 39(S1), 815. doi.org/10.1152/physiol.2024.39.S1.815.

Skills

Languages: Python, Java, R, Julia, MATLAB, HTML/CSS, SQL, Bash

Technologies: pandas, NumPy, SciPy, scikit-learn, PyTorch, Matplotlib, tidyverse, ggplot2, Jupyter, Git

Experience

Johns Hopkins University

Aug 2024 – Present

Teaching Assistant

- Lead 30-student weekly recitations for EN.553.420 Probability: github.com/dyao13/EN_553_420_SP24

McCallion Lab, Johns Hopkins Medicine

May 2024 – Present

Undergraduate Research Assistant

- Edit iPSCs with CRISPR Del/Rei to investigate the role of cis-regulatory elements in Parkinson's Disease
- Design primers with SnapGene and perform PCRs to genotype mice and iPSCs
- Analyze scRNA-Seq data with Seurat R package to study transcriptional differences in Parkinson's-positive mice

Garza Lab, Johns Hopkins Medicine

Feb 2024 – May 2024

Undergraduate Research Assistant

- Investigated function of fibroblasts to regulate keratinocytes with goal of modifying skin identity in amputees
- Isolated, cultured, and imaged fibroblasts taken from mouse epidermal tissue
- Analyzed fluorescence and brightfield images with ImageJ to quantify tissue identity

Onalaska High School

Sep 2022 – Jan 2023

Teaching Assistant

- Taught 20-student review sessions and tutored individual students for AP Calculus AB and AP Calculus BC
- Lectured on extracurricular topics such as epsilon-delta and trigonometric substitution

University of Wisconsin-La Crosse

Jun 2022 – Aug 2022

Research Intern

- Investigated the specific roles of CRF1 and CRF2 receptors in stress-induced increase in intestinal permeability
- Assayed transcellular and paracellular flux through mucosa/submucosa tissue taken ex vivo from mice
- Performed ANOVA statistical analysis and visualized data with ggplot2 in R

Projects

Pediatric Sedation Assessment | github.com/dyao13/PedAccel Aug 2024 - Present

- Develop statistical model to calculate sedative dosages for pediatric critical-care patients in Python
- Optimize existing preprocessing pipeline of 150 GB of ECG data with binary search for a 1,000x speedup
- Refactor codebase with object-oriented design to improve maintainability and readability
- Extract heart-rate variability features from 250 Hz ECG data in time and frequency domains and analyze nonlinear features with Poincare maps using SciPy, scikit-learn, and neurokit
- Create hidden Markov model with hmmlearn to predict sedation-state transitions
- Train ordinal regression model with mord and scikit-learn to predict sedation levels with 90% accuracy

Brawl Stars Draft Engine | github.com/dyao13/BrawlStars Jul 2024 - Aug 2024

- Searched for optimal draft of 3 picks out of 82 characters per team via minimax algorithm with alpha-beta pruning to yield a 12% edge over human players in friendly matches
- Optimized weights of individual and pairwise effects in SciPy to estimate win probability with 92% accuracy
- Scraped e-sports games using beautifulsoup4 logged ranked games with BrawlStarsAPI
- Employed draft strategies to reach top 1000 global ranking out of 15 million monthly players

Patient Referral Scheduler | github.com/dyao13/RefMe Jul 2024 - Aug 2024

- Awarded \$1000 JHU Catalyst Grant for early-stage research and development
- Optimized scheduling of patient referrals from a stochastic data stream to prioritize high-urgency patients in R
- Computed solutions via Monte Carlo methods and integer linear programming to yield a 25% improvement over a first-come-first-serve model
- Parallelized across 10 clustered CPUs to improve runtime by 12,000x compared to laptop performance

Cell Tracker | github.com/dyao13/cell_tracker Jan 2024

- Isolated centroid and areas of 40 cells with Sobel operator in MATLAB to achieve 98% accuracy compared to manual measurement with ImageJ
- Tracked cell movement over time by predicting next position with 4th-order finite difference methods

Activities

Organic Chemistry Initiative Baltimore, MD
Lecture Team Mar 2024 - Present

Hippocrates Med Review Baltimore, MD
Treasurer, Writer Sep 2023 - Present

Hopkins Symphony Orchestra Baltimore, MD
Cellist Sep 2023 - Present

Supporting Hospitals Abroad with Resources and Equipment Baltimore, MD
Shift Leader Sep 2023 - Present