Daniel Yao

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Education

Johns Hopkins University Baltimore, MD
M.S.E. Applied Mathematics and Statistics Expected May 2027
4.00 GPA

Johns Hopkins University Baltimore, MD
B.S. Applied Mathematics and Statistics, B.S. Biomedical Engineering Expected May 2027
4.00 GPA, 36 ACT, 1590 SAT

Relevant Coursework

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, R, Julia, SQL, MATLAB, 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 recitation sections for EN.553.420 Probability
- Write 44-page review for EN.553.431 Honors Mathematical Statistics: github.com/dyao13/EN_553_431_FA24

McCallion Lab, Johns Hopkins Medicine May 2024 – Present
Undergraduate Research Assistant

- Edit iPS cells 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 extracurrilcular topics such as epsilon-delta and trigonometric substituion

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 machine-learning model to calculate sedative dosages for pediatric critical-care patients in Python
- Optimize existing preprocessing pipeline of 100 GB of ECG data with binary search for a 1,000x speedup
- 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
- Train multiple linear regression model to predict sedation state with ECG features with 85% 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

- Granted $1000 JHU Catalyst Award for early-stage research and development
- Optimized scheduling of patient referrals from a stochastic data stream to prioritize high-urgency patients
- Computed solutions via Monte Carlo methods and integer linear programming with lpSolveAPI in R 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

ARTIS Over-the-Counter Hearing Aids Jan 2024 - May 2024

- Analyzed profiles and preferences of patients with mild-to-moderate hearing loss with goal to develop a mobile app marketplace for over-the-counter hearing aids backed by venture capital firm ARTIS
- Clustered and visualized 3300 audiometric profiles with UMAP, DBSCAN, and ggplot2 in R

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

Awards

Catalyst Award ($1000), Johns Hopkins University Oct 2024

Financial Education Scholarship ($5000), Altra Federal Credit Union Jun 2023

Individual Champion, Wisconsin NAQT Quiz Bowl Apr 2023

Finalist, National Merit Scholarship Corporation Feb 2023

US Presidential Scholars Candidate, Department of Education Jan 2023

Perfect AP US Government and Politics Exam, College Board Aug 2022