Daniel Yao

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Education

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

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, ggplot2, Jupyter

Experience

Johns Hopkins University Aug 2024 – Present
Teaching Assistant

- Lead 30-student weekly recitation sections for upper-level EN.553.420 Probability

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 and analyze images with ImageJ

Onalaska High School Sep 2022 – Jan 2023
Teaching Assistant

- Taught 20-student review sessions and tutored individual students for AP Calulus 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 test and data visualization 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
- Extract heart-rate variability features from 250 Hz electrocardiogram data in time and frequency domains and analyze nonlinear features with Poincare maps using SciPy, Matplotlib, and neurokit in Python
- Recruit clinical study participants and assist nurses in collecting State Behavorial Scale, vitals, and accelerometry data

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
- Computed Nash equilibrium of simultaneous choice of 3 bans per team via linear programming in SciPy
- 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

- 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 12000x compared to laptop performance

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

- Developed mobile application to match patients to over-the-counter hearing aids backed by VC firm ARTIS
- Trained multiple regression model to map responses to a 25-component questionnaire to hearing aids in Python
- Clustered and visualized 3300 audiometric profiles with UMAP, DBSCAN, and ggplot2 in R

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

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

Conway's Game of Life | github.com/dyao13/conways_game_of_life Jan 2024

- Create dynamic GUI application for Conway's Game of Life with GUIDE in MATLAB with features to import .rle patterns and export .mp4 movies

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

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

Community Service Scholarship ($1000), Altra Federal Credit Union May 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

Relevant Coursework

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