

# Daniel Yao

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## Education

### Johns Hopkins University

B.S. Applied Mathematics and Statistics, B.S. Biomedical Engineering  
4.00 GPA, 36 ACT, 1590 SAT

Baltimore, MD

Expected May 2027

## Relevant Coursework

Unofficial Transcript: [github.com/dyao13/CV/blob/main/transcript/yao\\_transcript.pdf](https://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.

## Experience

### Johns Hopkins University

Aug 2024 – Present

*Teaching Assistant*

- Lead 30-student weekly recitation sections and staff office hours 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 Calculus AB and AP Calculus BC

### 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 in R

## Projects

### Pediatric Sedation Assessment | [github.com/dyao13/PedAccel](https://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 collect State Behavioral Scale, vitals, and accelerometry data

### Brawl Stars Draft Engine | [github.com/dyao13/BrawlStars](https://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](https://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](https://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](https://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

**Academic Scholarship (\$1500)**, Onalaska High School

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

## Skills

**Languages:** Python, R, Julia, SQL, MATLAB, Bash

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