Daniel Yao

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Education

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

Coursework

Unofficial Transcript: github.com/dyao13/CV/blob/main/yao_cv/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, SQL, Bash
Technologies: pandas, NumPy, SciPy, scikit-learn, Tensorflow, PyTorch, Jupyter, Git

Experience

Johns Hopkins University Aug 2024 - Present
Teaching Assistant
- Lead 20-student weekly recitations for upper-level EN.553.420 Probability
- Write review guides: github.com/dyao13/EN_553_420_SP24, github.com/dyao13/EN_553_431_FA24

Clark Lab, Johns Hopkins University Jan 2025 - May 2025
Undergraduate Research Assistant
- Design reinforcement learning agent with deep Q-learning to regulate pressure-control ventilation in ARDS patients using Gymnasium and PyTorch to select optimal parameters with 97.5% accuracy
- Simulate pressure-volume loop with nonlinear circuit model using PSpice and Simulink to generate data for 17,280 combinations of parameters

McCallion Lab, Johns Hopkins Medicine May 2024 - Dec 2024
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 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

Risk Bot | github.com/dyao13/risk_agent Apr 2025 - June 2025

- Design reinforcement learning agent to play Risk board game with deep Q-learning using Gymnasium and Keras to achieve 80% win rate against heuristic agent

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

- Develop statistical model to calculate sedative dosages for pediatric critical-care patients in Python
- 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 neurokit2
- 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
- Scraped e-sports games using beautifulsoup4 and 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

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

Johns Hopkins Math Tournmament Baltimore, MD
Writer Dec 2024 - Present

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