Daniel Ruskin

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Education

Bachelor of Science, Washington University in St. Louis Expected May 2025
Computer Science | *Second Major: Systems Science & Engineering* | *Minor: History*
GPA: 4.00/4.00

College Year in Athens May 2024 – Jun 2024
HIST 346: Diversity, Difference and Regionality among the Greek States

Research Interests

Machine Learning, Visualization, Network Science, Equity, Interdisciplinary Research

Publications

1. **Ruskin, D.**, Rasul, R., & McCann-Pineo, M. (2022). Predictors of Emergency Department Opioid Use Among Adolescents and Young Adults. *Pediatric Emergency Care*, *38*(8), e1409–e1416.

Research/Professional Experience

The Brent Lab at Washington University in St. Louis Aug 2023 – Present
Undergraduate Researcher

- Mentors: Michael Brent, PhD | Woo Seok Jung | Sandeep Acharya
- Map networks connecting transcription factors to their target genes in specific human tissues, utilizing an XGBoost model to capture information from various data sources in Python and R.
- Run machine learning models to produce inputs for XGBoost, parallelize code to reduce runtime of models, and write scripts to evaluate results.
- Worked full time in the lab for ten weeks from Jun 2024 – Aug 2024.

Regeneron Pharmaceuticals Jun 2023 – Aug 2023
Molecular Profiling and Data Science Intern

- Mentor: Hyunjin Kim, PhD
- Built user interface in R Shiny for biologists to visualize internal spatial transcriptomics data and run their own machine learning analyses.
- Developed novel approach for visualizing cell-cell interactions using ligand-receptor pairs; incorporated this approach as a tool in the user interface along with tools for visualizing clusters and gene expression.

The Feinstein Institutes for Medical Research at Northwell Health Apr 2020 – Jul 2021
High School Researcher

- Mentors: Rehana Rasul, MA, MPH | Molly McCann-Pineo, MS, PhD
- Applied machine learning methods in R and SAS to identify predictors of emergency department opioid use among adolescents and young adults.
- Conducted literature search, integrated five machine learning techniques for variable selection, ran weighted logistic regressions to determine associations with opioid use, and performed separate sensitivity analyses to assess differences in patterns between adolescents and young adults.

Presentations

1. Jung, W.J., Acharya, S., **Ruskin, D. (presenter)**, Liao, S., Moghaddam, V.A., & Brent, M.R. (2024). Mapping Transcription Factor Regulatory Networks in Human Tissues Using Ensemble Learning. *Midstates Consortium Undergraduate Research Symposium in the Physical Sciences, Mathematics and Computer Science*. Talk.
2. Jung, W.J., Acharya, S., **Ruskin, D. (presenter)**, Liao, S., Moghaddam, V.A., & Brent, M.R. (2024). Mapping Transcription Factor Regulatory Networks in Human Tissues Using Ensemble Learning. *Undergraduate Research Symposium at Washington University in St. Louis*. Talk.

Course Projects

Contribution to the WashU & Slavery Project Fall 2024
Anthro 373: Introduction to GIS for Anthropologists

- Digitize and georeference St. Louis property data using ArcGIS for the WashU & Slavery Project, a university-wide endeavor to uncover how WashU developed in the context of slavery after it was founded in 1853.
- Collaborate with classmates to create an ArcGIS StoryMap analyzing how prominent WashU affiliates benefited from their ties to slavery.

Assessing Walkability Around WashU Fall 2024
Engr 310: Technical Writing

- Devise a formula to evaluate the walkability of four neighborhoods near WashU, incorporating travel times to essential locations as well as qualitative information on safety and neighborhood aesthetics.
- Write a magazine article providing guidance to WashU students searching for off-campus housing, incorporating novel walkability scores, walk-time maps created in ArcGIS, and interviews with students.

Exploring Algorithmic Bias in Healthcare Fall 2022
ESE 359: Signals, Data and Equity

- Worked with two classmates to design a website reviewing racially biased algorithms in the healthcare setting, as part of Dr. Neal Patwari's course on recognizing tools of oppression in technology and systems.

Teaching Experience

Introduction to Engineering Design, Washington University in St. Louis Spring 2023, Spring 2024
Assistant Instructor

- Helped students complete Python projects on the Raspberry Pi by sharing coding tips at weekly office hours and labs.
- Promoted applications on a breadboard, Pi camera, ADC, and motor, culminating in a project involving the autonomous control of a small car.

Introduction to ESE, Washington University in St. Louis Fall 2022, Fall 2023
Peer Solving Team Leader

- Orchestrated weekly problem-solving sessions with eight students in Introduction to Electrical and Systems Engineering.
- Reinforced linear algebra concepts taught in lectures and guided students through real-world MATLAB assignments, with objectives such as modeling strategies for mitigating COVID spread in Missouri.

Extracurricular Experience

Washington University Design Build Fly Sep 2021 – Present
Simulation Development Lead (Sep 2022 — Present)

- Lead Simulation Development team of eight members and collaborate with five other teams to construct an aircraft for an annual competition.
- Teach team members essential coding skills through work on design optimization, score sensitivity analysis, and flight simulation in MATLAB.

Washington University Sports Analytics Sep 2021 – Feb 2024
Executive Board Member (Jan 2022 — Feb 2024)

- Organized workshops on acquiring and analyzing data to answer intriguing sports questions, each involving a presentation from the executive board and a mini-hackathon in Python or R.
- Hosted a guest speaker from the Texas Rangers in 2023 and competed at the 2022 Society for American Baseball Research Analytics Conference.

Awards

Antoinette Frances Dames Award, Washington University in St. Louis Apr 2023
One of 20 sophomores selected for productive scholarship in engineering