KYLE SONI

kylesoni.github.io

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EDUCATION

NORTHWESTERN UNIVERSITY   EVANSTON, IL

Bachelor of Arts, Majors: Computer Science, Physics, and Integrated Science   SEP 2020 - JUN 2024

- GPA: 3.83. Relevant Coursework:

Machine Learning	Natural Language Processing	Linear Algebra
Data Structures and Algorithms	Programming Languages	Partial Differential Equations
Operating Systems	Advanced Statistical Methods	Multivariable Calculus

EXPERIENCE

KOVACS LAB: PHYSICS/COMPLEX SYSTEMS - NORTHWESTERN UNIVERSITY   EVANSTON, IL

Research Assistant   MAY 2023 - PRESENT

- Investigated a variation of the Barabási–Albert model as part of a 7-person team, generating random networks with various rulesets for growth and analyzing their changing characteristics.
- Wrote and optimized Python code for network generation, enabling the creation of sufficiently large networks (up to 1 million nodes) to study previously unseen behavior
- Delivered visualizations and analyses of 50 real network datasets (e.g., the citation network), comparing their properties (e.g. degree distribution, degree ratios, diameter) with our models
- Presented a lightning talk and and a poster at international academic conferences (NetSci and Dynamics Days)

KOVACS LAB: PHYSICS/COMPLEX SYSTEMS AND LEE LAB: NEUROBIOLOGY - NORTHWESTERN UNIVERSITY   EVANSTON, IL

Research Assistant   MAY 2021 - MAR 2023

- Analyzed gene expression data of taste cells to determine how stem cells differentiated into mature cell types (sweet, bitter, etc.)
- Delivered t-SNE and UMAP visualizations and used principal component analysis to group the cells by type
- Developed a linear model that relates transcription factors (TFs) and genes via interaction networks, using the network matrix to identify 12 TFs that influence resulting cell type

COMPUTER SCIENCE DEPARTMENT - NORTHWESTERN UNIVERSITY   EVANSTON, IL

Teaching Assistant - Computer Game Design and Development   SEP 2023 - DEC 2023

- Led office hours and graded exams for an undergraduate course on the computational foundations of video games, covering topics such as serialization, coordinate systems, and computer graphics.

PROJECTS

SANDBOX COMPUTER GAME (https://kylesoni.itch.io/safe-space)   JAN 2024 - MAR 2024

- Collaborated with a 4-person team to develop a 2D sandbox computer game using the Unity engine (C#)
- Created various game elements, including the movement system, the dynamic enemy AI, and visuals

STATISTICAL METHODS PROJECT (https://github.com/kylesoni/measuring-the-m-sigma-relation)   SEP 2023 - DEC 2023

- Extracted black hole mass and galaxy velocity dispersion from the literature and HyperLEDA database (SQL) to determine the M-σ relation, accounting for uncertainties in both variables
- Fit a mixture model using a Bayesian approach and Markov Chain Monte Carlo (Python)

SKILLS

- Languages: Python, C, C++, C#, R, JavaScript, CSS, SQL
- Technical: Python Packages (Numpy, Matplotlib, Pandas, scikit-learn), Unix, Jupyter, Git, SDLC