BRANDON ISMALEJ

(747) 254-5831, brandon.ismalej.671@my.csun.edu

EDUCATION

Bachelor of Science in Computer Science
expected Spring 2026
Minor in Data Science & Minor in Mathematics
California State University, Northridge
Major GPA (Upper Division Courses): 3.88/4.0
Cumulative GPA: 3.22/4.0

Relevant Coursework:

- **Computer Science**: Automata, Languages, and Computation; Advanced Data Structures; Data Structures and Program Design; Operating Systems with Lab; Software Engineering with Lab; Computer Architecture & Assembly Language; Computer Organization
- **Mathematics and Data Science**: Discrete Mathematics; Linear Algebra; Combinatorial Algorithms; Probability and Statistics; Foundations of Higher Mathematics; Calculus I & II
- **Physics**: Mechanics; Electricity & Magnetism with Lab

Dean's List Achievements

- Spring 2024
- Fall 2023
- Summer 2023
- Spring Semester 2022
- Fall Semester 2020

RESEARCH INTERESTS

- Synthetic data generation and statistical modeling of rare events.
- Developing methods for large-scale, representative synthetic datasets to enhance ethical machine learning.
- Larger than Life cellular automata, focusing on integrating computer science to enhance their theoretical mathematics through scripting, data science, and algorithm development

AWARDS AND HONORS

- Cal-Bridge Scholar, Cal-Bridge Program, 2024
- Research Supplies Grant, Office of Undergraduate Research, CSUN, Award: $500
- Society of Hispanic Professional Engineers (SHPE) CSUN Board Member Nomination, 2024
- Hispanic Scholarship Fund (HSF) Scholar, 2024
- Nike Hispanic Serving Institution (HSI) Scholarship, 2024, Award: $10,000

RESEARCH EXPERIENCE

LAEP Student Research Assistant
Larger than Life, Cellular Automata
Supervisor: Dr. Kellie Evans | Department of Mathematics
California State University, Northridge
September 2023 – Present

- Funding: Transition from volunteer role to funded position from Learning-Aligned Employment Program (LAEP) offered by the CSUN Office of Undergraduate Research.

Contributing a minimum of 10 hours per week during semester for the following duties:

- Developing and maintained Lua scripts for Golly software to manipulate and analyze Larger than Life cellular automata.
- Created dynamic pattern generation and precise data extraction scripts, enabling the generation and analysis of hundreds of thousands of patterns within a few hours, compared to the previous method of analyzing one pattern at a time.
- Conducted experiments to gather supporting evidence for specific rules and patterns, contributing to the validation of my professor's conjecture.
- Analyzing the data using MATLAB, employing numerical analysis methods to effectively interpret and present research findings.
- Managed a GitHub repository [https://github.com/Brandon-Ism/LTL-GollyScripting] for documentation and versioning of scripts, ensuring a reliable and accessible script archive.

Research Intern
Machine Learning-based Energy Prediction for Workload Management in Datacenters
Supervisor: Dr. Xunfei Jiang | Department of Computer Science
California State University, Northridge
June 2024 – August 2024

- Funding: CSUN – SECURE for Student Success (SfS^2) Program
- Through funding of SfS^2, participated in the NSF REU Site: Applying Data Science on Energy-efficient Cluster Systems and Applications.
- Conducted comprehensive literature reviews on workload management, machine learning for GPU temperature, power, and energy prediction, and workload scheduling algorithms.
- Developed GPU-intensive applications using Python and CUDA for parallel programming, serving as benchmarks for data collection and experiments.
- Conducting statistical analyses of Alibaba and Helios workload traces to study real world, inter-task delay times of GPU applications.
- Collected and processed approximately 40 hours of GPU run data, performing data aggregation to average out oscillations in power use.
- Developed and optimized LSTM, XGBoost, LightGBM, and CatBoost models for power prediction, improving RMSE from ~3.5 to ~0.35, reaching a better RMSE than ~1.5 from previous research, through data optimization and hyperparameter tuning.

Research Intern
Solving Physics Equations with Neural Networks
Supervisor: Dr. Yang Peng | Department of Physics & Astronomy
California State University, Northridge
June 2024 – August 2024

- Funding: CSUN – SECURE for Student Success (SfS^2) Program
- Developed and implemented Kolmogorov-Arnold Networks (KANs) as Physics-Informed Neural Networks (PINNs) to solve the chaotic damped driven pendulum equation.
- Collaborated with team members working on Multi-Layer Perceptrons (MLPs) and traditional ODE solvers (SciPy) for comparative analysis.
- Analyzed and compared the performance of KANs against MLPs and SciPy solvers in terms of accuracy, efficiency, and interpretability.
- Conducted experiments to validate the effectiveness of KANs, leveraging their learnable activation functions for improved accuracy and interpretability.

Student Assistant
CSUN Noyce Program
Supervisor: Dr. Kellie Evans | Department of Mathematics
California State University, Northridge
April 2024 – June 2024

- Funding: NSF - The Robert Noyce Teacher Scholarship Program
- Developed and analyzed educational tools using GeoGebra to support the training of educational technology for current and future STEM educators.
- Assisted in research on the applicability of polynomial factoring in secondary education using MATLAB
  - Created a MATLAB program that generates random polynomials based on user-defined parameters.
  - Calculated the proportion of factorable polynomials from a generated set to inform potential shifts in teaching methodologies.
  - [Link to MATLAB program]

TEACHING EXPERIENCE

Mathematics Tutor
Mathematics Tutoring Center
Supervisor: Prof. Andrea Nemeth | Department of Mathematics
California State University, Northridge
September 2021 – Present

- Conducting tutoring sessions in MATH 340, MATH141, MATH140BUS, and MATH140SCI, adapting to various learning styles through individual, group, and Zoom formats.
- Enhancing students' proficiency and application of statistical tools, such as TI-84 & StatCrunch, directly contributing to their academic success in statistics courses.
- Actively engaged in lab tutoring, providing immediate, hands-on support during practical lab components.

Supplemental Instructor
Course: UNIV60NN
Supervisor: Andrea Cabadas | The Learning Resource Center
California State University, Northridge
September 2023 – December 2023

- Led twice-weekly supplemental instruction sessions for MATH106, employing a collaborative and interactive approach to teach challenging topics and promote long-term retention.
- Collaborated with the course instructor to ensure alignment with lecture content, enhancing the cohesiveness and impact of academic support.
- Developed and implemented targeted lesson plans and assignments, emphasizing critical thinking and problem-solving skills.
- Maintained detailed records of student progress and engagement through a gradebook and regular assessments, using data to tailor future instruction and provide targeted feedback.
- Held office hours, offering additional, personalized support and building rapport with students, creating a nurturing and accessible academic environment.

PRESENTATIONS AND WORKSHOPS

CSUN GeoGebra Summer Institute 2024, Western Regional Noyce Network
Presenter and Instructor
June 24-28, 2024

- Led the "Build with Brandon" workshop, teaching current and prospective teachers scripting in GeoGebra and other tools for classroom use. Covered topics such as data visualization, statistical analysis, and the use of GeoGebra scripts to automate and customize educational content.

PROFESSIONAL AFFILIATIONS

- Member, Society of Hispanic Professional Engineers (SHPE), CSUN Chapter

PROFESSIONAL DEVELOPMENT

- Full Sponsorship from CSUN Office of Undergraduate Research to Attend NCUR, 2024
- Intro to Machine Learning Certificate; Kaggle, Jan. 2024
- Crisis Counselor; Crisis Text Line, Mar. 2020 – Jul. 2021

SKILLS

Programming & Software Development:

- Knowledge of Java, Python, and C with the ability to apply these languages to software tasks and data manipulation.
- Experienced with IDEs and text editors such as VS Code, Sublime Text, IntelliJ, PyCharm & CLion.

Scripting & Automation:

- Proficient in Lua scripting, particularly for Golly software in cellular automata simulation and analysis.
- Developed and optimized scripts in MATLAB for data analysis, visualization, and numerical analysis.

Statistical Analysis & Tools:

- Skilled in application of statistical software and tools such as TI-84 calculators, StatCrunch, and GeoGebra for statistical analysis and visualization.
- Led workshops on scripting and data visualization using GeoGebra.

Machine Learning & Data Science:

- Developed and optimized machine learning models (LSTM, XGBoost, LightGBM, CatBoost) for predictive analytics.
- Conducted data preprocessing, aggregation, and statistical analysis for large datasets.

Documentation & Version Control:

- Proficient in Markdown for creating clear, structured documentation.
- Experienced with Git and GitHub for version control, collaboration, and repository management.
- Familiar with LaTeX via Overleaf for preparing mathematical assignments and academic documents.

LANGUAGES

- Spanish: Native Fluency

REFERENCES

Available Upon Request