Brandon Ismalej

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Education

California State University, Northridge, BS in Computer Science — Aug 2020 - May 2026

- Minor in Data Science, Minor in Mathematics
- Major GPA: 3.9/4.0; Cumulative GPA: 3.3/4.0
- **Computer Science Coursework:** Parallel and Distributed Computing, Theory of Computation, Database Design, Operating Systems, Software Engineering, Advanced Data Structures, Computer Architecture, Computer Organization
- **Mathematics & Data Science Coursework:** Statistical Learning, Statistical Modeling, Data Mining, Machine Learning, Probability and Statistics, Combinatorial Algorithms, Discrete Mathematics, Linear Algebra, Foundations of Higher Mathematics, Calculus I & II
- **Physics Coursework:** Mechanics, Electricity & Magnetism

Research Interests

- Synthetic data generation
- Information-theoretic foundations of data science
- Ethical and responsible data science
- Trustworthy and privacy-preserving machine learning
- Statistical modeling and inference
- High dimensional data analysis

Awards and Certifications

Dean's List, California State University, Northridge; Fall 2020, Spring 2022, Summer 2023 – Spring 2025

STAR Travel Scholarship Associated Students, CSUN — Award: $600 (2025)

Travel Scholarship Office of Undergraduate Research, CSUN — Award: $250 (2025)

Cal-Bridge Scholar, Cal-Bridge Program — 2024

Research Supplies Grant, Office of Undergraduate Research, CSUN — Award: $500 (2024)

Board Member Nomination, Society of Hispanic Professional Engineers (SHPE), CSUN Chapter — 2024

HSF Scholar, Hispanic Scholarship Fund — 2024

Nike HSI Scholarship, Nike — Award: $10,000 (2024)

NCUR Travel Sponsorship, CSUN Office of Undergraduate Research — Full funding to attend NCUR (2024)

Intro to Machine Learning Certificate, Kaggle — January 2024

Publications

- **B. Ismalej**, M. Smith, X. Jiang, "Machine Learning-Based GPU Energy Prediction for Workload Management in Datacenters". 2025 IEEE 15th Annual Computing and Communication Workshop and Conference (CCWC), Jan 6-8, 2025, Las Vegas, NV, USA. [DOI]
- **B. Ismalej**, K. M. Evans, "Automating Large-Scale Detection and Classification of Larger Than Life Cellular Automata Patterns". 2025 IEEE 15th Annual Computing and Communication Workshop and Conference (CCWC), Jan 6-8, 2025, Las Vegas, NV, USA. [DOI]
- **B. Ismalej**, X. Ruan, X. Jiang, "Evaluating Privacy and Utility of Synthetic Tabular Data with Membership Inference Attacks". *Submitted to IEEE FMLDS 2025*.
- J. Prayoonpruk, M. Kozlov, **B. Ismalej**, X. Jiang, N. Ho, "Stress Detection Through Sleep-Based Physiological Signals: An Integrated Semi-Supervised and Supervised Learning Approach". *Submitted to IEEE FMLDS 2025*.
- K. M. Evans, **B. Ismalej**, "Larger than Life: Jitter Bugs". *Manuscript in progress*.

Research Experience

Research Intern, How Neural Networks Transform Data Jun 2025 – August 2025
UC San Diego – Halıcıoğlu Data Science Institute & Dept. of Mathematics

Student Researcher, Larger-than-Life Cellular Automata Sep 2023 – Present
CSU Northridge – Dept. of Mathematics

- Developing Lua scripts for a cellular automata simulation software, Golly, to generate, extract data from, visualize, and analyze the behavior of automata patterns, enabling large-scale exploration and classification across parameter spaces. [GitHub Repository]
- Applied MATLAB for trajectory fitting, spline modeling, and scalable geometric transformations to support the investigation of convergence behavior in generalized "bug" patterns toward a Euclidean limit.

Research Team Lead, BORACLE – Intelligent Algorithms Team Aug 2024 – Present
CSU Northridge – Autonomy Research Center for STEAHM

- Lead and manage a cross-functional research team of 6 undergraduate and 8 master's students applying data science and machine learning techniques to enhance athletic performance and reduce injury risk; responsibilities include recruitment, onboarding, task delegation, and coordination with the project PI.
- Independently developed and evaluated deep learning models for sleep stage classification from wearable time series data, including LSTM and CNN architectures, focal loss, and downsampling from 64 Hz input.

Research Intern, ML-Based Energy Prediction for Datacenters Jun 2024 – Aug 2024
CSU Northridge – Dept. of Computer Science

- Developed and optimized LSTM, XGBoost, and CatBoost models for GPU power prediction, significantly improving RMSE using real-world workload data and statistical feature engineering.
- Developed GPU-intensive applications using Python and CUDA to run on a Linux server with automated Bash scripts; collected and processed 40+ hours of GPU trace data and Python to analyze inter-task delays and inform energy-efficient workload scheduling.

Research Intern, Solving Physics Equations with Neural Networks Jun 2024 – Aug 2024
CSU Northridge – Dept. of Physics & Astronomy

- Modeled the chaotic damped driven pendulum using Kolmogorov-Arnold Networks (KANs) as Physics-Informed Neural Networks, incorporating learnable activation functions for improved accuracy and interpretability.
- Conducted comparative analysis of KANs, Multi-Layer Perceptrons, and SciPy ODE solvers, evaluating accuracy, computational efficiency, and behavior across dynamical regimes.

Student Assistant, NSF Robert Noyce Teacher Scholarship Program Apr 2024 – Jun 2024
CSU Northridge – CSUN Noyce Program

- Created educational tools, instructional videos, and custom GeoGebra scripts to support STEM educator training in mathematical visualization and educational technology.
- Developed a [MATLAB program] to generate random polynomials and analyze factorability trends, contributing to research on effective methods for teaching algebraic factoring.

Teaching & Mentoring Experience

Mathematics Tutor, Mathematics Tutoring Center Sep 2021 – May 2024
CSU Northridge – Department of Mathematics

Delivered personalized instruction through individual and group sessions, both in-person and online for: Introduction to Probability and Statistics, Essentials of Statistics, Introductory Statistics for Business, Introductory Statistics for STEM. Provided expert guidance on TI-84 and StatCrunch, helping students apply statistical methods and succeed in coursework.

Supplemental Instructor, Learning Resource Center Sep 2023 – Dec 2023
CSU Northridge – Course: Supplemental Instruction M106

Led twice-weekly support sessions for Math106: Mathematical Foundations for Non-Calculus Physics, designing targeted lesson plans that emphasized problem-solving and critical thinking. Collaborated with course faculty, tracked student progress, and provided individualized feedback during office hours.

Peer Mentor, SECURE for Student Success (SfS^2) Program Nov 2024 – Present
CSU Northridge – Department of Computer Science

Mentored incoming freshmen and transfer students in the CS program, offering guidance on coursework, academic success, and professional development while connecting students with campus resources.

Presentations and Workshops

Talk — "Boracle (The Oracle for Your Body): An Open-Source Platform for Streamlining Wearable Data Access" May 23, 2025
ARCS Seminar 2025

Talk — "Intelligent Algorithms for Athletic Performance Analysis" May 2, 2025
CSUN Senior Project Design Showcase 2025

Poster — "Sleep Stage Classification from Wearable Sensor Data: Toward Transparent and Accessible Health AI" Apr 19, 2025
SoCal AI Responsibility Summit 2025

Invited Talk — "Predictive Energy Modeling for GPU Workloads: A Machine Learning Approach to Sustainable Data Centers" Apr 16, 2025
University of Idaho Graduate Seminar Series

Poster — "Machine learning-based Sleep Stage Classification Using Wearable Technology" Apr 4, 2025
2025 CSUNposium

Poster — "BORACLE Intelligent Algorithms (IA): Advancements in Health Analytics & Risk Detection" Nov 8, 2024
2024 CSUN REU Workshop

Talk — "Advancing the Study of Larger than Life Cellular Automata with Lua Scripting" Sep 13–15, 2024
Cal-Bridge Fall Conference 2024

Talk & Poster — "Solving Nonlinear Differential Equations with Neural Networks" Sep 11, 2024
CSUN SfS^2 First Annual Undergraduate Research Symposium

Talk & Poster — "ML-Based Energy Prediction for Workload Management in Datacenters" Sep 11, 2024
CSUN SfS^2 First Annual Undergraduate Research Symposium

Workshop (Instructor) — "Build with Brandon" Jun 24–28, 2024
CSUN GeoGebra Summer Institute – Western Regional Noyce Network

Projects

Mentorship & Research Collaboration Matching System [GitHub Repository]

- Designed a full-stack web platform with normalized relational schema and built-in CRUD, search, and matching logic for academic profile creation and mentorship/collaboration discovery, for a database design course.
- Tools Used: Python, Flask, MySQL, HTML/CSS

Forecasting Sleep Efficiency from Behavioral Data [GitHub Repository]

- Implemented feature selection (correlation, mutual information, RFE, random forest importance) and developed boosting models to forecast sleep efficiency using real-world behavioral/lifestyle data, for a graduate-level machine learning course.
- Tools Used: Python, scikit-Learn, pandas, matplotlib, seaborn

Life Expectancy Prediction Using Machine Learning [GitHub Repository]

- Performed data cleaning, feature encoding, exploratory analysis, and baseline linear regression with diagnostic plots to model global life expectancy from WHO health and socioeconomic indicators, for a statistical modeling course.
- Tools Used: Python, statsmodels, pandas, matplotlib, seaborn

Technologies

Languages: Python, Lua, MATLAB, Java, C

Technologies: MySQL, HTML, Visual Studio Code, Sublime Text Editor, JetBrains DataSpell & PyCharm

Professional Affiliations

- Institute of Electrical and Electronics Engineers (IEEE), Student Member
- Society of Hispanic Professional Engineers (SHPE), CSUN Chapter

Other Experience

Crisis Counselor Mar 2020 – Jul 2021

Crisis Text Line

- Chatting with texters using empathetic and active listening communication techniques to bring them from hot moments to a cool calm; Risk assessing all texters to determine imminent risk that could lead to an active rescue