Beck T Saunders

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EDUCATION

M.S., Statistics - California State University Northridge (CSUN), May 2025
GPA: 3.667

B.S., Applied Mathematical Sciences (Physics minor) - CSUN, May 2022
GPA: 3.2

EXPERIENCE

Thesis Work CSUN Math Department, Winter 2024 - Spring 2025

- My thesis involved **applying consistent variable selection methods to GARCH-X time series models**
- We take a large dataset of time series data with several external variables, and consistently select which of these variables best describe the data (for the sake of prediction)
- Applied genetic/ evolutionary algorithms to remove our method's dependency on initial conditions
- Received a grant from the NSF

Teaching Associate CSUN Math Department, Spring 2023 - Spring 2025

- I teach the corresponding lab classes for my students' math lectures
  - Pre-calculus, Business Calculus, Calculus 1 and Calculus 2

Undergraduate Research Associate CSUN, Spring 2022 - Fall 2022

- Worked one-on-one with a professor to study Chebyshev [orthogonal] expansions, numerical Galerkin methods, weakening nonlinear differential operators and 2nd-order integration by parts
- Presented at the CSUN Math Department Open House (May 2022)

AWARDS

- **Teaching Associate Award -** CSUN, Fall 2023
- **Outstanding Graduating Senior Award -** CSUN, May 2022
- **Outstanding Mathematics Major Award -** CSUN, May 2021

PROJECTS

Route Optimizer

- Coded a program that takes in n user-inputted addresses, and finds the quickest route that stops at all of them
  - Real-time traffic data was received using the tomtom API
  - Geopy was used to geocode the addresses. Folium was used to draw the generated route on a map
  - Dijkstra's algorithm was utilized to calculate the shortest path between nodes

Bevbot!

- Built a robot that tracks hand-movement within a camera frame, using a stepper motor and linear actuator to pitch and yaw the camera, and fires a canned beverage at the hand from across the room using an air compressor and pneumatic piston through voice activation
  - Software is coded in Python using OpenCV and Pyfirmata
  - Electronics (stepper motor, solenoid valve, custom PCBs) driven by an Arduino Uno microcontroller
  - Powered by a 48 V power supply, 12 V motorcycle batteries and a 20 V Li-ion battery

Concrete Compressive Strength

- Created a machine learning model in Python using Scikit-learn to predict concrete compressive strength from a set of measured variables
  - Used variable selection (PCA, factor analysis, CCA), multiple linear regression, clustering, cross-validation
  - Used gradient boosting and random forest algorithms to predict compressive strength
  - Helped develop skills for applying machine learning algorithms to real-world data sets

SKILLS

- **Programming**
  - **Languages:** Python, SQL; some R, C++
  - **Modules:** Matplotlib, numpy, Pytorch, scikit-learn, pandas, geopandas; some shapely, contextily, geopy, folium
- **Software**
  - PostgreSQL, Docker, Microsoft Programs (Excel, Word, etc.), git; some AWS, Spark
- Studying for Amateur Radio Technician License
- Can play the violin, currently learning to play the guitar

RELEVANT COURSEWORK

Deep Learning, Bayesian Data Analysis, Multivariate Statistics, Numerical Optimization, Stochastic Processes, Numerical ODEs