Daniel Antonio Razo

Applied Mathematician, Data Scientist, Computational Linguist

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Education

Utah Valley University   *Orem, UT, USA*
Master of Computer Science   Aug 2022 – May 2024
- Primary research: Pruning and optimizing decision trees via residuals from high-dimensional multiple linear regression.

University of Utah   *Salt Lake City, UT, USA*
Master of Arts, Linguistics   Aug 2018 – June 2020
- Thesis title: *Spanish Adverbials: Scales and Repetition*
- Primary research: Form and meaning of Spanish aspectual adverbials within a minimalist syntax framework.

Bachelor of Arts, Linguistics   Jan 2016 – Dec 2017

Professional Experience

Instructional Assistant Lab Manager   *May 2022 – Current*
Utah Valley University, Dept of CS   Orem, UT, USA
- Regularly tutor and grade for students in assigned courses.
- Train other T.A.'s and I.A.'s to perform duties to exemplary standards.
- Maintain the lab as a safe, productive environment for walk-in tutoring.
- Occasionally substitute for classes, collaborate with professor to improve course material, and conduct exam reviews.

Adjunct Instructor   *May 2023 – Aug 2023*
Utah Valley University, Dept of CS   Orem, UT, USA
- Lead discussion and instruction for assigned courses.
- Responsibly facilitate education for 20–30 students per class.
- Tailor the approach of the material to the needs of the students.

Teaching Assistant   *Aug 2018 – May 2020*
University of Utah   Salt Lake City, UT, USA
- Grade 100–200 assignments biweekly.
- Tutor students in assigned courses.
- Occasionally lead class discussions.

Publications

1. Razo, D. (in progress). "Pruning decision trees via residuals of high–dimensional multiple linear regression". Orem, UT: Utah Valley University.

2. Razo, D. (2020). "Spanish adverbials: Scales and repetition". Salt Lake City, UT: University of Utah.

Research Presentations

1. Razo, D. (2023). *An intro to natural language processing*. Utah Valley University Data Science Club Master Class Series. Orem, UT, USA.

2. Razo, D. (2020). *Spanish adverbials: Scales and repetition*. Thesis defense. University of Utah. Salt Lake City, UT, USA.

3. Razo, D., Csirmaz, A., & Slade, B. (2019, Oct 31 – Nov 2). *Spanish aspectual adverbials*. 48th Meeting of the Linguistic Association of the Southwest (LASSO). Baton Rouge, LA, USA.

4. Razo, D. (2019). *Ya, todavía, and aún: Towards formalizing some meanings and uses of Spanish aspectual adverbials*. University of Utah Student Conference in Linguistics (UUSCIL). Salt Lake City, UT, USA.

5. Razo, D. (2018). *Repetitive in Spanish, from older varieties to Modern Spanish*. University of Utah Undergraduate Research Symposium (URS). Salt Lake City, UT, USA.

6. Razo, D., & Rodriguez, J. (2018). *Synchronic and diachronic analyses of compensatory lengthening*. University of Utah Student Conference in Linguistics (UUSCIL). Salt Lake City, UT, USA.

7. Bleazard, K., Brown, Y., Demple, J., Kaiser, E., Ng, S., Razo, D., & Rodriguez, J. (2017). *Welcome to the python ramen bar*. University of Utah Student Conference in Linguistics (UUSCIL). Salt Lake City, UT, USA.

Projects

Spotify Playlist Recommendations Using K-Means
Utah Valley University Data Science Club
- https://github.com/datascienceclubUVU/UVU-2022-2023
- Develop the k-means model and the machine learning pipeline.
- Regularly collaborate with team members on project status.

Reinforcement Learning for Calculating Hausdorff Dimension
Solo Project
- https://github.com/razodan/rl_hausdorff_dimension/
- Project successfully calculates the Hausdorff dimension of an image, given some integer RGB pixel value threshold.
- Next stage of the project is to combine RL and a neural network to find optimal values for the input RGB threshold and the output Hausdorff dimension, provided some image.

Practice With Kalman Filtering
Solo Project
- https://github.com/razodan/kalmanfilter
- Original project was to develop a simple Kalman filter for a self-balancing robot with Lego Mindstorms. Further developed the project as a mathematical simulation to account for position, velocity, and acceleration.

Scheduling Assignments with Integer Programming
Solo Project
- https://github.com/razodan/scheduling_assignments
- Original project was to solve an NP-complete problem with integer programming. Currently working on improving the project for reliability, robustness, and ease-of-use.

Programming Languages
(Language — level out of 5)
- Python — 5/5
- C++ — 4/5
- LaTeX — 4/5
- PostgreSQL — 3/5
- VEX — 3/5

Technical Skills
(Organized by similarity)
- Jupyter, anaconda, keras, pandas, numpy, PuLP, regex, git.
- Extended Kalman filter, SLAM algorithms.
- Linear regression, CNN, sentiment analysis, gradient descent.
- Causal inference, concentration of measure, curse of dimensionality.
- Monte Carlo methods, alpha-beta pruning, Markov decision processes.
- Abstract algebra, group theory, set theory, elliptic curve cryptography, Hausdorff dimension, quaternion rotation, integer programming.

Natural Languages
(Language — level out of 5)
- English — 5/5
- Spanish — 5/5
- Italian — 4/5
- Mandarin Chinese — 3/5

Utah Valley University
As adjunct instructor
- **Summer 2023**: CS 2420 Intro to Data Structures and Algorithms, CS 2370 C++ Programming

As teaching assistant
- **Fall 2023**: CS 4470 Artificial Intelligence, CS 3530 Database Management for Data Science
- **Spring 2023**: CS 3530 Database Management for Data Science, CS 3060 Operating Systems Theory, CS 2700 Causal Inference, CS 2370 C++ Programming, CS 1030 Foundations of Computer Science
- **Fall 2022**: CS 3060 Operating Systems Theory, CS 2600 Computer Networks I, CS 2420 Intro to Data Structures and Algorithms, CS 2370 C++ Programming
- **Summer 2022**: CS 2420 Intro to Data Structures and Algorithms, CS 1410 Object-Oriented Programming, CS 1400 Fundamentals of Programming

University of Utah
As teaching assistant
- **Fall 2018**: LING 1069 Bad Words & Taboo Terms
- **Spring 2019**: LING 1069 Bad Words & Taboo Terms
- **Fall 2019**: LING 4010 Introduction to Phonetics & Phonology
- **Spring 2020**: LING 5011 Intermediate Phonology

Music: Xenofantasia on Bandcamp, Spotify, YouTube, Apple Music, and Soundcloud.