

Salvador Robles Herrera

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Objective

Enthusiastic and motivated international student, incoming Master of Science in Computer Science student at The University of Texas at Austin. Eager to deepen my understanding of computer science concepts, with a keen interest in machine learning and artificial intelligence. Aspiring to contribute to the academic community by engaging in research that pushes the boundaries of machine learning algorithms and their applications. Looking forward to facing challenges in the AI field by leveraging the techniques learned from the program and making impactful contributions. Excited to be part of a great community of growth and learning, collaborating with like-minded peers, and acquiring knowledge from esteemed faculty.

Education

Double Major in Computer Science and Mathematics

The University of Texas at El Paso (UTEP)

Graduation Date: May 2024

El Paso, Texas

Bachelor of Science in Computer Science

Major GPA: 3.94

Concentration in Data Analytics

Relevant coursework: Deep Learning, Machine Learning, Computer Vision, Data Mining, Database Management, Data Structures, Computer Architecture, Adv. Object-Oriented Programming, Programming Languages, Theory of Operating Systems, Software Integration and V&V, Automata Theory

Bachelor of Science in Mathematics

Major GPA: 4.00

Concentration in Statistics

Relevant coursework: Modern Algebra, Linear Algebra, Statistic Inference, Applied Regression Analysis, Matrix Algebra, Numerical Analysis, Discrete Mathematics, Probability and Statistics, Differential Equations, Calculus I, II, III, Statistical Methods

Academic Honors

Top Academic Scholarship – Excellence award for incoming Freshmen

Dean's List:

Fall 2019, Spring/Fall 2020, Spring/Fall 2021, Spring 2022, Spring/Fall 2023, Spring 2024

Summa Cum Laude – Mathematics & Computer Science

Outstanding Undergraduate Student In Mathematics Award (Top graduating student 2024)

Research Experience

Fairness in ML - UTEP

Responsible, Informative, and Secure Computing Lab (RISC) Lab – Dr. Tizpaz-Niari

Undergraduate Research Assistant

May 2023 - Present

- Researched **group fairness** in multiple Machine Learning algorithms provided by scikit-learn regarding initial hyperparameter configuration.
- Applied ML regression algorithms to provide .
- Participated in academic research forums discussing latest research papers in the area of NLP, specifically LLMs. **Delivered presentations**, on three occasions, to showcase main findings of a research paper.

Applications of Neural Networks - UTEP

Theoretical Research and Applications in Computer Science (TRACS) Lab – Dr. Kreinovich

Undergraduate Research Assistant

May 2021 - Present

- Experimented with mathematical approaches to explain computational heuristics with knowledge from Neural Networks.
- Explored areas such as deep learning, uncertainty, and optimization.
- Collaborated on **5 published** research papers, with a current total of **2245 downloads**.

Publications

- **S. Robles Herrera**, V. Monjezi, V. Kreinovich, A. Trivedi, S. Tizpaz-Niari, “Predicting fairness of ML software configurations”, Proceedings of the 20th International Conference on Predictive Models and Data Analytics in Software Engineering (PROMISE’24).
- **S. Robles**, M. Ceberio, and V. Kreinovich, “How to get the most accurate measurement-based estimates”, In: M. Ceberio and V. Kreinovich (eds.), *Uncertainty, Constraints, and Decision Making*, Springer, Cham, Switzerland, 2023, pp. 165–175.
- **S. Robles**, M. Ceberio, and V. Kreinovich, “Why model order reduction”, In: M. Ceberio and V. Kreinovich (eds.), *Decision Making under Uncertainty and Constraints: A Why-Book*, Springer, Cham, Switzerland, 2023, pp. 233–237.
- **S. Robles**, M. Ceberio, and V. Kreinovich, “Computing the range of a function-of-few-linear-combinations under linear constraints: a feasible algorithm”, In: M. Ceberio and V. Kreinovich (eds.), *Uncertainty, Constraints, and Decision Making*, Springer, Cham, Switzerland, 2023, pp. 451–457.
- **S. Robles Herrera**, M. Ceberio, and V. Kreinovich, “When is deep learning better and when is shallow learning better: qualitative analysis”, *International Journal of Parallel, Emergent and Distributed Systems*, 2022, DOI: 10.1080/17445760.2022.2070748.
- **S. Robles Herrera**, M. Ceberio, and V. Kreinovich, “Foundations of neural networks explain the empirical success of the ‘surrogate approach to ordinal regression – and recommend what next’”, submitted to an edited book.
- **S. Robles**, M. Ceberio, and V. Kreinovich, “Computing the range of a function-of-few-linear-combinations under linear constraints: a feasible algorithm”, Proceedings of the 15th International Workshop on Constraint Programming and Decision Making CoProD’2022, Halifax, Nova Scotia, Canada, May 30, 2022.

Work Experience

Uber Technologies Inc

Software Engineering Intern

May 2022 - Aug 2022

- Worked in the Data Security team, helping on efforts to classify Uber's data by experimenting with multiple **Machine Learning** algorithms.
- Collected **10 thousand** examples of data from Uber's environment for ML training using a Scala program that uses Spark.
- Outperformed previous overall classification accuracy by **5%** leveraging Python to create **ML models** after designing different feature engineering approaches.

Google

Software Engineering Intern

May 2021 - Aug 2021

- Worked at the Industry Workflow Foundations team helping on the **migration** from Borg (internal cloud) to Vertex AI (Google Cloud API).
- Added support for scalable vector matching relying on container's local volume (Python).
- Implemented a handler to copy data from Google internal storage systems to Google Cloud Storage.
- Produced an algorithm in C++ that will be affecting **thousands** of Recommendation pipelines when running in production.

Google

STEP Intern

May 2020 - Aug 2020

- Created "GoSafe: Routes for Women" in collaboration with two interns, a **Web App** built for women that displays safer routes avoiding user-submitted crime reports between two locations (HTML/CSS).
- Designed and implemented an obstacle avoiding **recursive algorithm** in JavaScript that displays the safest route possible, since there is no feature for avoiding obstacles currently in Google Maps.
- Leveraged Google Maps and Directions API for route directions, and Java Servlets to store crimes reported information from users.

Teaching Experience

Computer Architecture Course (CS 3432) – Dr. Shirley Moore

Undergraduate Teaching Assistant

Jan 2022 – Jun 2022

- Assisted in the preparation and delivery of **5** different projects, using the RISC-V architecture, throughout the semester as well as other instructional materials.
- Held office hours to provide **guidance** and support to students, addressing questions related to RISC-V, assembly language programming, and computer organization.
- Participated in weekly team meeting with the instructor to discuss effective teaching strategies and coordinate sessions.

Computer Architecture Course (CS 3432) – Dr. Eric Freudenthal

Undergraduate Teaching Assistant

Aug 2021 – Dec 2021

- Established 1:1 sessions for a class of **40 students**, tutoring and **coaching half** of the students every week to respond questions on computer organization, translation from C to assembly, introduction to systems, etc.
- Collaborated with teaching assistant to conduct two weekly hands-on Lab sessions covering topics of the lecture and assisting in project assignments.
- Met weekly with professor to develop teaching materials, including assignments, quizzes, and supplementary resources.

Student Organizations

The Coding Interview Club (CIC)

Student Organization External Relations Officer

Aug 2019 – May 2024

- Coached around **20 students** on developing Problem-Solving skills by hosting bi-weekly organization sessions.
- Mentored members to land their first internship through weekly resume reviews and mock interviews. Solved 1-3 LeetCode-type questions per session and presented them.
- Collaborated with a group of 5 fellow officers to establish and achieve organizational goals, fostering a sense of community and support among students.

The Machine Learning Social Club

Student Organization Member

Jan 2023 – May 2024

- Participated in meetings every two weeks to foster dialogues about latest advances in technologies, such as Large Language Models and text-to-image generating systems.
- Communicated about fairness in the field of ML and AI and the problems and implications of unregulated new intelligent systems.

Society of Physics Students (SPS)

Student Organization Member

Jan 2023 – May 2024

- Participated in monthly meeting regarding physic concepts that have a strong connection to computational aspects.
- Attended conversations in applications of Neural Networks to physics problems.

Academic Projects

Independent Research project

Finding Polynomial Roots with LLMs

Oct 2023 – Present

- Worked on implementing a program that leverages the capability of LLMs in finding textual patterns to solve polynomial roots equations.
- Leveraged SymPy to create artificial roots from equations (**40 thousand**) for ML training and testing.

Computer Vision Course

Image Inpainting (Removal Prediction Filler)

Nov 2022 – Dec 2022

- Created an image inpainting program, reconstructed **8 thousand images** that contained missing regions using Python and TensorFlow.
- Pushed the boundaries of traditional Deep Convolutional Neural Networks with Convolutional Autoencoders achieving a **11 times better** performance metrics and reproducing better image outputs.

Deep Learning Course

Dog Breed Identification

Sep 2022 – Oct 2022

- Led a team of three to create a **classifier** which identified 120 possible breeds of dogs.
- Leveraged a Transformer model to explore attention-based mechanisms for image classification. Outperformed by **20%** Dense and Convolutional Neural Networks.

Community Engagement

UX Research and Design for Elderly Community

Oct 2023 - Nov 2023

- Pursued a class project focused on community engagement with the elderly, involving weekly meetings with a senior community member to discuss and identify technology-related challenges.
- Collaborated within a team of three to design a prototype for a data transferring system between devices (e.g. phone to computer), addressing usability concerns for older adults.
- Incorporated principles from **Google for Startups'** design recommendations to enhance user interface and overall user experience.

El Paso City Event – Dia de Los Muertos

Nov 2021

- Played a key role in organizing and coordinating the Dia de Los Muertos event, a cultural celebration attracting thousands of Hispanic attendees in El Paso area.
- Supervised a diverse team to set up approximately **20 tents and altars**.
- Engaged in cleanup activities, including placing, and emptying trash cans, and maintaining a tidy environment through communication with the volunteering team.

Skills

- **Programming Languages:** Python (3+ years); Java and C (2+ years); R, C++, SQL, HTML/CSS (1+ years); JavaScript, Haskell, Scala (6+ months)
- **Technologies:** Pandas, TensorFlow, Keras, NumPy, SymPy, spaCy, Apache Spark, OpenCV, Scikit-learn, Git, Unix/Linux
- **Languages:** Spanish (native) and English (fluent)