Joshua Emilio Lazaro

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Education

Stanford University — **Stanford, CA**
PhD. Candidate in Biomedical Data Science — September 2023-Expected 2029
GPA: 3.86

The University of Texas at San Antonio (UTSA) — **San Antonio, TX**
Bachelor of Science | Statistics and Data Science — August 2019-May 2023
Concentration: Biology — GPA: 3.95

Research Experience

Stanford PhD Candidate in Biomedical Data Science — **Stanford, CA**
California Department of Public Health & The Mordecai Lab — June 2024 – Present

- Major Project: Multi Modal Probabilistic Machine Learning West Nile Virus Forecasting
- Built an automated probabilistic forecasting pipeline in Python using XGBoost Distribution to predict rare-event counts for the CA Department of Public Health
- Outperformed 21 models in the 2024 CDPH forecasting challenge by engineering a novel negative binomial regression model for distributional case count forecasting
- Enabled data-driven scenario planning by delivering high resolution probabilistic visualizations of disease forecasting 1 year in advanced

Medicaid and Medicare Office of Enterprise and Data Analytics — **Washington, DC**
Coding it Forward Fellow — June 2023 – September 2023
Research mentor: Social Science Research Analyst James DelAguila

- Major Project: Drivers of Medicare Advantage Adoption: Modeling Market and Beneficiary Characteristics
- Engaged in a high-profile project subject to a ***Non-Disclosure Agreement***, focusing on the modeling of market and beneficiary characteristics to influence policy in the healthcare sector
- Employed programming languages, such as SAS, python, and SQL to manipulate, analyze, and implement Generalized Linear Models with notable predictive accuracy, further laying the groundwork for enhanced forecasting techniques in future initiatives.

Undergraduate researcher at The New Haven Free Clinic — **New Haven, CT**
New Haven Clinic — June 2022 – September 2022
Research mentor: Yazhini Ramesh, Yale MPH Candidate

- Major Project: Linear models demonstrate reduction in expensive and difficult inpatient care for undocumented patients in New Haven
- Analyzed and manipulated 3k patient observations from 4-5 years through SAS and R programming to demonstrate the “value-added” by HAVEN Free Clinic to the Yale New Haven Hospital
- Developed linear and logistic regression analyses derived from medical reports and Electronic Health Records for comparing of patient blood pressure trends over various treatments and appointments

Research Experience (cont.)

Yale BioMed Amgen Scholar in cancereffectsizeR Project **New Haven, CT**
Yale School of Medicine June 2022 – September 2022
Laboratory of Jeffrey Townsend, Ph.D., mentored by Ph.D. candidate, Nick Fisk

- Major Project: Quantifying the effect size of colorectal cancer gene mutations in 1015 patient exomes through cancereffectsizeR
- Conducted computational and evolutionary techniques to quantify the statistical effect size of 46 genes and their variants to discover their role in the progression of colorectal cancer
- Calculated gene level mutation rates through likelihood estimates for the expected number of mutations in a gene to attain the average selection advantage conferred upon mutations
- Utilized lab-developed R package, cancereffectsizeR, to analyze high dimensional mutation annotation files and calculated cancer effect size values to compare p-value metrics from Zhao et *al*. study

X-ray Computer Vision at University of Texas Health Center **San Antonio, TX**
Research instructor: Daniel Montemayor September 2021- March 2022

- Major Project: Increasing the accuracy of gross line detections in infants Xray scans via Computer Vision
- Feature engineered, image pre-processed, and transferred learning to fine tune deep learning methods such as CNN
- Reduced noise in images by applying transformations and filters through scikit image library
- Attained image processing for computer vision in Python certifications through DataCamp

Stanford Summer Research Program Genetics Scholar **Stanford, CA**
Stanford Summer Research Program School of Medicine June 2021 – August 2021
Laboratory of Nima Aghaeepour, Ph.D., mentored by Ph.D. candidate, Camilo Espinosa

- Major Project: Differential disease trajectories between children in low- and middle-income countries through multivariate machine learning models
- Analyzed over 7k proteomic, metabolomic, and clinical features through R programming to study patient outcomes between urban and rural children in low middle income countries.
- Independently harmonized, integrated, and cleaned collinearities in heterogeneous data to adapt, gather, and examine, for machine learning algorithms
- Constructed multivariate machine learning algorithms such as XGBoost to calculate probabilities of survival and found biological differences in urban and rural environments.

Undergraduate Researcher in Cancer Atlas Project **San Antonio, TX**
University of Texas Health Center Sep 2020 - Mar 2021
Laboratory of Alexander Bishop, Ph.D., mentored by Ph.D. candidate, Henry Miller

- Learned how to build machine learning models to classify binary dependent variables
- Revised data sets that consisted of missing points and multicollinearity
- Independently studied machine learning algorithms to teach non-computational lab members beginners' level computational concepts
- Began to refine the lab-developed Ewing sarcoma localization algorithm for analyzing cancer in bone tissues

Computational Projects

Leveraging Large Language Models for Adaptive Mental Health Training **Stanford, CA**
Final Report April 1st – June31st, 2025

- Built and evaluated an AI powered training platform to upskill mental health counselors in low-resource settings
- Engineered failure mode injections, developed a flawed AI training detection curriculum, and developed quantitative metrics to evaluate counselor reliance on flawed AI outputs
- Collaborated with an India based crisis hotline to benchmark synthetic patient agents and integrate our AI Copilot into a live clinical workflow

Computational Projects (cont.)

Trajectories of born infants in the United States – A Neural Network Approach **San Antonio, TX**
National Security Agency - RowdyDatathon Oct 1st – 2nd, 2022

- Investigated the socioeconomic factors that influence low birthweight and newborn mortality from 1960 - 2010
- Manipulated, adapted, and harmonized 15 Gb of data that were applied to Neural Networks and Time Series Forecasting modeling to predict future birth trends in the United States.

Mars Rover - Computer Vision and American Sign Language **Denton, TX**
Hack University of North Texas April 23rd – 24th, 2022

- Modeled a rover for space exploration that allows the deaf community to experience
- Created a computer vision and machine learning model that detects American sign language and is controlled by specific hand signal inputs
- Analyzed and transformed data for personal website through google clouds API

Nutrient Film Technique (Hydroponics) with Computational Programming **San Antonio, TX**
Rowdy Hacks Mar 27th – 28th, 2022

- Automated farming techniques through sensors and artificial intelligence to maximize yields of crops in all parts of the world
- Utilized Arduinos, and sensors to detect algae, plant growth, pH, and humidity levels from water
- Used machine learning CNN's and computer vision methods through image segmentation and edge detection to detect genus of plant along with plant growth and height
- Developed a website that updates users on categorical and continuous measurements obtained from the sensors

Job Hunting After Incarceration **College Station, TX**
Texas A&M University Datathon Oct 17th -18th, 2022

- Utilized Beautiful Soup python library to web scrape blue collared jobs for people after incarceration
- Began developing a database system for users to access specific jobs searched by the user
- Learned HTML to establish the connection with tabula while overcoming runtimes linked in the file path

Rowdymon **San Antonio, TX**
RowdHacks Mar 26th – 28th, 2021

- Created a retro pixel game inspired by Pokémon and based on the UTSA campus
- Learned a new programming language, C++, to animate sprites and character design
- Developed character battle scenes along with command buttons to fight or exit matches
- Began creating a website through REACT for leaderboard scores through servers and API's

Cranial Automobile Mechanical Protection (CAMP) **Denton, TX**
Biomedical Make-A-Thon at University of North Texas Feb 26th -28th, 2021

- Designed a car headrest that reduce and eliminate traumatic brain injuries during car crashes
- Utilized AUC and ROC curves to find success rate in activation of CAMP
- Created a business and financing analysis for mass production of CAMP and potential applications to reduce traumatic brain injuries in electric cars.

City Search with Geographic Information Systems **College Station, TX**
TAMU Datathon Oct 16th -17th, 2020

- Manipulated geographical data points revolving around major cities in the United States
- Applied Geographic Information System to generate a website dashboard
- Converted spatial coordinates to transform the data set suitable for American audiences
- Researched and obtained categorical features for information on cities

Java Attendance Tracker **Magnolia, TX**
Magnolia High School Independent School District Oct 2019 - Mar 2020

- Utilized Java skills to create a tutoring attendance tracker during lunch breaks
- Implemented database systems such as MySQL to store users
- Added the ability to remove and add students based on hire faculty requirements

Leadership Experience

Director of Outreach **San Antonio, TX**
Code Quantum - "The First Minority Gender Hackathon in San Antonio" Mar 2021 - Present
- Recruited over 108 students to participate in San Antonio's first marginalized gender annual hackathon
- Communicated with and recruited sponsors from Google, JPMorgan, Valero, etc. to fund workshops & career fair throughout the hackathon
- Cultivated partnerships between universities in San Antonio to promote institutional diversity
- Mentored students for guidance during the 24 hour coding competition

President **San Antonio, TX**
Association for Computing and Machinery Womens/Minority Chapter (ACM-WM) Mar 2021 - Apr 2022
- Empowered over 300 members (117 non-CS majors) in the field of Computer Science by conducting bi-weekly meetings with underrepresented speakers in various sectors of the field
- Recruited sponsors such as MatrixAI, HEB and Paycom to sponsor events and workshops
- Founded an introductory Python workshop for members with no experience in CS
- Collaborated with organizations around UTSA to empower students outside of CS via workshops

Co-Chief Executive Officer **San Antonio, TX**
United Nations Millennium Fellow July 2020 - Mar 2021
- Founded a program that empowers first generation high school students through educational workshops to promote access to higher education
- Connected UTSA students with high school students to receive college application guidance
- Presented First Generation High School students to UTSA campus organizations to enhance their potential college experience along with degree decisions
- Assisted the United Nations in completing sustainable goals "#1: No Poverty" and "#4: Quality education"

Honors College and College of Data Science Residential Assistant **San Antonio, TX**
UTSA Housing and Residence Life Sep 2020 - Present
- Organizing and hosting events such as "Los Datos Conferencia" revolving around Data Science
- Planning educational programs to promote diversity and a community of success
- Connecting residents with resources on and off campus

President **Magnolia, TX**
National Hispanic Honor Society Feb 2018 - Mar 2019
- Organized and facilitated meetings and served as student spokesperson for the Spanish Department
- Introduced students to various Hispanic cultures through the form of presentations and social food events
- Created a peer mentor program to tutor underclassmen in Spanish grammar

Work Study **San Antonio, TX**
Bicultural Bilingual Studies Department at UTSA Sep 2019 - Sep 2020
- Conducted entry level analytical research with data collection for faculty for database
- Created verbal exams for Spanish 3XXX and 4XXX courses
- Assisted students through the enrollment of CLEP exams

Quiz Bowl Team Captain **Magnolia, TX**
SkillsUSA Feb 2018 - Feb 2019
- Mentored underclassmen and hosted weekly meetings to enhance historical, mathematical, and scientific knowledge
- Guided teams through run throughs, and topic events in district, regional, and state competitions

Higher Level Spanish Tutor **Magnolia, TX**
International Baccalaureate & Advance Placement Mar 2015 - May 2022
- Mentored both Non/Native Speaker students in Preparation for the AP Spanish Language and Culture exam, AP Spanish Literature exam, and IB Spanish Higher-Level exams
- Guided students through 46 Spanish literature novels ranging from the Spanish Golden Age through the Modernism and the generation of 98
- Created weekly workshops on writing techniques, and provided feedback on preparatory essay examinations

Leadership Experience (cont.)

Computer Science, Math, & Science Team Leader **Magnolia, TX**
University Interscholastic League (UIL) Texas Oct 2015 - May 2019

- Competed in regional, district, and state competitions in 5A districts across Texas
- Lead daily after school trainings for students to participate in, specifically in Java programming, Chemistry, and precalculus
- Attended weekend competitions to represent the Magnolia ISD district

Oral and Poster Presentations

[INVITED] **Models of Infections Disease Agenet Study (MIDAS) Conference** **Washington, DC,** Nov 1st, 2025

- Presentation: Multimodal forecasting of West Nile Virus cases using Probabilistic Forecasting

[INVITED] **Stanford: El Centro Chicano y Latino** **Stanford, CA,** Feb 13th, 2025

- Talk: How to Thrive in Graduate School: A First-Generation Perspective

[CONTRIBUTED] **The American Society for Tropical Medicine & Hygiene** **New Orleans, LA,** Nov 15th, 2024

- Poster: Probabilistic Forecasting of West Nile Virus Cases in California using Climate Data and Machine Learning Methods.

[INVITED] **Medicaid and Medicare Data Science Group** **Washington, DC,** Sept 18th, 2023

- Poster: Generalized Linear Models demonstrate key financial drivers of Medicare Advantage adoption.

[CONTRIBUTED] **The New Haven Free Clinic Symposium** **New Haven, CT,** Sept 11th, 2022

- Poster: Linear models demonstrate reduction in expensive and difficult inpatient care for undocumented patients in New Haven

[*CONTRIBUTED]* Yale BioMed Amgen Scholars Symposium **New Haven, CT,** Aug 5th, 2022

- Poster: Quantifying the selective advantage of colorectal cancer by driver genes in a whole-exome sequencing cohort of 1015 patients

[INVITED] **Amgen Scholars Conference** **Los Angeles, CA,** July 9, 2022

- Selected as 1 of 26 students to represent the Yales Amgen Scholars program to deliver an elevator pitch on my cancereffectsizeR project

[INVITED] **Climate Teach In | UTSA Office of Sustainability** **San Antonio, TX,** Mar 30th, 2022

- Nominated as one of 10 invited guest speakers to present on the applications of Artificial Intelligence towards agriculture, oceanography, and climate analysis
- Selected as the only undergraduate speaker amongst a speaker list of 10 tenured faculty members
- Demonstrated how AI can help reduce our carbon footprint while also automate methods of agricultural harvest in arid regions of the world

[*CONTRIBUTED]* University of Texas at San Antonio Experiential Learning Fair **San Antonio, TX** Mar 21st, 2022

- Poster: Presented on summer 2021 research project on "*Differential Disease Trajectories in Urban and Rural Environments*'" from Stanford School of Medicine at the Honors College Annual Symposium

[*CONTRIBUTED]* University of Texas at San Antonio Experiential Learning Fair **San Antonio, TX** Mar 21st, 2022

- Poster: Presented poster at the Honors College Annual Symposium on the importance of Bridging the Diversity gap in computer science
- Demonstrated The Association of Computing Machinery's efforts on increasing marginalized communities' engagement in computer science in the city of San Antonio

[*CONTRIBUTED]* Stanford Annual Research Symposium **Stanford, CA** Aug 10th–12th, 2021

- Presentation: Presented on "Differential Disease Trajectories in Urban and Rural Environments'" at the annual Stanford research symposium

Oral and Poster Presentations (cont.)

[*CONTRIBUTED]* University of Texas at San Antonio Experiential Learning Fair San Antonio, TX March 20th, 2021

- Poster: Presented summer internship poster on my how my role at the Rocky Mountain Conservation Corps renovated trails in the Rocky Mountains National Park
- Explained the importance of funding for National Parks, and the impact of trails during the Covid-19 Pandemic

Extracurricular and Volunteer Experience

First Generation Mentor **Stanford, CA**
El Centro Chicano y Latino Sept 14th 2023 - Present

- Mentored 5 first generation Stanford undergraduate students, providing academic guidance, career advice, and community support
- Organized regular check-ins and resource-sharing sessions to help mentees navigate Stanford's academic and social environment

Peer2Peer PhD Application Mentor **Stanford, CA**
The Department of Biomedical Data Science Oct 10th 2023 - Present

- Mentor prospective graduate students on the PhD application process, with a focus on programs in medical and biomedical data science
- Collaborated with students to review and refine written application materials, providing feedback on structure, clarity, and research fit

Trebuchet Catapult Competition **San Antonio, TX**
UTSA College of Engineering Pumpkin Smash Sept 1st, 2021 – Nov 10th, 2022

- Constructed a 10 ft x 20 ft trebuchet for the annual trebuchet competition using scrap metal, cement, 2x4 lumber, and rebar
- Tested the launch and managed of pumpkins that resulted in 100 ft of distance from starting point
- Hosted workshops to teach students how to use masonry skills to create weights to balance the machine

American Institute of Steel Construction (AISC) Student Steel Bridge Competition **San Antonio, TX**
American Society for Civil Engineers December 2020 – March 2021

- Fabricated a 50-foot scale-model steel bridge to be assembled during the annual regional steel bridge competitions
- Created blueprints for a 50-foot-wide steel bridge using AutoCAD
- Mentored students on how to weld and cut steel to assemble the bridge
- Tested and loaded the bridge to support 2500 pounds in preparation for the regional competition

Spartan 5k, 10k, 21k **Houston, TX & Boulder, CO**
Trifecta Recipient April 2021 - July 2021

- Trained and competed for a series on races comprising of over 5,000 global competitors
- Completed the 5k, 10k, and 21k, leading to be recipient of a trifecta, the highest spartan honor
- Recipient of Top 10 out 486 runners May 31st Spartan 5k in age bracket and top 1% of runners amongst 16 thousand runners worldwide

AmeriCorps **Boulder, CO**
Rocky Mountain Conservation Corps May 2020 – Aug 2020

- Devoted 300+ hours of community service to AmeriCorps in Nederland Colorado in efforts to improve State and National Parks
- Assisted the National Park Rangers, USDA Forest Service, and the Boulder Climbing Stewards crews by helping to eliminate invasive plants and re-vegetation
- Learned about the importance of analyzing big, longitudinal data studies in our fight to combat climate change

Extracurricular and Volunteer Experience (cont.)

Masonry House Foundations **Houston, TX**
J & J Demolition May 2012 – May 2023

- Constructed masonry foundations around the city of Houston for development of houses
- Managed heavy machinery such as bulldozers, cranes, and cement trucks to construct containers to hold up to 3 tons of cement
- In 2021 built over 20 foundations for the city of Houston for subsidized housing for low income adults

Honors and Awards

National Science Foundation Graduate Research Fellowship Program (NSF-GRFP) Apr. 5th , 2025

1st Place West Nile Virus Forecasting – California Department of Public Health Challenge Jan. 27th , 2025

MAC3 Computing in Precision Health PhD Fellow in Honor of Paul Berg Jan. 25th, 2023

2nd Place Advanced Team National Security Agency Rowdy-DataThon Oct. 1st – 2nd, 2022

The Jerry and Mary Keating Endowed Scholarship in Statistics June 1st, 2022

1st Place Google Cloud API | 3rd Place General UNT Hackathon April 23rd – 24th, 2022

1st Place General and 1st Place Hardware Track RowdyHacks Mar 27th – 28th, 2022

University of Texas at San Antonio Alvarez Research Fellow Jan. 3rd, 2022

- Selected as 1 out of 10 students from a pool of 200
- UTSA Alvarez Research Fellowship awards 10 select undergraduate students to conduct research in the field of business

Hispanic Scholarship Fund Fellow and Recipient June 25th, 2021

- Merit-based award, designed to aid Top students of Hispanic heritage in their pursuit of a college degree

National Oceanic Atmospheric Administration EPP Undergraduate Scholarship Finalist Feb 18th, 2021

- Finalist to conduct research at a NOAA facility during two paid summer internships.
- Declined for Stanford's Summer Research Program

2nd Place Region American Institute of Steel Construction (AISC) Student Steel Bridge April 29th, 2021

2nd Place Region University of North Texas Biomedical Engineering Feb 28th, 2021

Honors College Experiential Learning Fair Poster Top 5 Posters Award March 20th, 2021

United Nations Millennium Fellowship July 21st, 2021

- Selected out of a pool 15,000 students and a 6% acceptance rate, to elevate and promote United Nations Development Goals in the City of San Antonio

Rotary Club of Magnolia "Student of Excellence" award May 15th, 2019

- Award granted to 8 of 1,164 senior high school students in Magnolia ISD based on academic and leadership achievements

SkillsUSA 1st Place Region Quiz Bowl May 7th, 2019

- Tested on knowledge of various aspects of general academic knowledge, professional development, and current events.

Honors and Awards (cont.)

Efta Lone Star Sci://tech Region 1st Place Science Bowl Team Feb 14th, 2019

- Education for tomorrow alliance annual Science Bowl competition ranging from basic biology through college level physics and math

US House of Representatives Commendation Apr 21, 2018

- Awarded the “Outstanding Public Achievements” commendation by Texas 8th district representative, Kevin Brady, for creating Magnolia, Tx’s, Student Lead Day of Service.

HP CodeWars 5th place team at Houston Mar 4, 2017

- Annual state programming competition held by Hewlett Packard in Houston, Tx for high school students
- Teams have 3 hours to answer 30 computer programming to programmatically determine results

Skills and Certifications

Proficient in R and Python
Proficient in MS Office Productivity Suite
Intermediate in Java, SQL, LaTeX, AutoCAD, Bash/Unix and AWS
Bilingual in Spanish

Data Camp Certified in Introduction to Python
Data Camp Certified in Intermediate Python
Data Camp Certified in Machine Learning with scikit Learn
Data Camp Certified in Image Processing in Python