Hortencia J. Hernandez, Ph.D.

Data Scientist | Statistician | Researcher

hjhernandez2016@gmail.com
www.linkedin.com/in/hortencia-hernandez
github.com/hjhernandez3

Career Profile

Data Scientist specializing in statistical modeling and network analysis, with a focus on synthetic data generation for privacy-preserving research. Developed a novel approach that integrates graphical and survey data to produce high-quality synthetic datasets. Experienced in both methodological development and applied analytics, with a strong record of scholarly communication through posters, manuscripts writing, and data visualization projects (R Shiny). Collaborative researcher dedicated to advancing ethical, interpretable, and scalable AI systems for biomedical and social applications.

Skills

Technology/Data Science

- Programming & Data: MATLAB, R, Python, SQL, SAS, SPSS, Java, C++/C#, Go, HTML, CSS
- Visualization & Apps: Tableau, Power BI, R Shiny
- Statistics: Bayesian statistics, linear/logistic regression, time series analysis, propensity score matching, Psych Stats
- Network Science: graph theory modeling, graph analysis concepts, social network modeling and analysis
- Data Management & Governance: REDCap, Qualtrics, IRB/CITI training
- Mathematics: Linear algebra, calculus I-III, business calculus, and differential equations

Professional Experience

The University of Texas at El Paso

PhD Research Associate   January 2023 – August 2025

- Conducted a longitudinal study analyzing social networks of students
- Coordinated participant scheduling and maintain IRB-compliant documentation
- Developed visualization tools to track network changes over time
- Extracted insights from student interaction datasets using statistical models
- Showcases the network for first-year teachers for the University's research office
- Built and documented analysis pipelines for quality-controlled reports

Graduate Teaching Assistant   September 2020 – December 2022

- Managed course content and student records on Blackboard; providing feedback and tutoring in math and statistical concepts to students
- Developed instructional materials supporting understanding of complex concepts

UTHealth School of Public Health (GETPHIT)

Data Integration Team Intern   January 2024 – April 2024

- Part of the Gaining Equity in Training for Public Health Informatics and Technology (GETPHIT) program
- Partnered with the City of El Paso Department of Public Health (CoEPDPH) to enhance data integration efforts
- Enhanced the data processes to support foundational public health services by optimizing data pipelines and standardizing data handling
- Created a 2022 Flu Dashboard using Power BI and R to process, clean, and visualize health data
- Presented the 2022 Flu Dashboard to public health leadership, demonstrating the need for quality data intake
- Developed SOPs and designed figures for leadership meetings

El Paso Community College

Academic Tutor   January 2021 – August 2025

- Tutored students in algebra through calculus III, differential equations, and statistics (business, psychological, probability)
- Provided targeted support in introductory programming/statistical tools (e.g., C, C++, Python, R, SPSS, SAS, Excel)
- Mentoring peer tutors: shared strategies, reviewed problem-solving approaches, and modeled effective session plans
- Hosted workshops to build tutoring skills and consistency in the team
- Maintain session records through Microsoft Excel

Education

Ph.D., Data Science—The University of Texas at El Paso El Paso, Texas   (GPA: 3.75)   **August 2025**
Dissertation: *A Multi-Modal Method for Synthetic Data Generation in Social Network Analysis*
Methods: R, LLMs, social network analysis, generative modeling, simulation/validation
M.S., Statistics—The University of Texas at El Paso El Paso, Texas   (GPA: 3.68)   **December 2022**
Thesis: *Evaluation of Effect of Preprocessing Algorithms on Resting State fMRI Data*
Methods: signal processing, time series/graph modeling methods, hard and soft thresholding
B.S., Mathematics (Minor: Music)—Baylor University—Waco, Texas   (GPA: 3.07)   **December 2019**

Research Experience

Ph.D. Research Associate – Department of Mathematical Sciences
The University of Texas at El Paso, El Paso, TX   2022 – 2025
Advisor: Dr. Amy Wagler
- Led quantitative research on social network analysis in two teacher preparation programs to understand support networks
- Collaborated with the El Paso Community Foundation to develop survey instruments for the Skills Link Series

Ph.D. Dissertation – Data Science
The University of Texas at El Paso, El Paso, TX   2023 – 2025
Advisor: Dr. Amy Wagler
- Developed a multi-modal synthetic generation method for use in social network analysis
- Employed stochastic conditional modeling, latent structure, and large language models (LLMs) to generate synthetic data
- Use of graphical-based and feature-based attributes to generate quality synthetic data

Research Collaborator
The University of Texas at El Paso, El Paso, TX   2022 – 2025
Mentor: Dr. Emre Umucu and Dr. Amy Wagler
- Conducted statistical analysis to identify psychosocial and demographic predictors of homelessness among U.S. veterans
- Applied moderation analysis, logistic regression, and interaction modeling
- Supported manuscript writing

Master's Thesis – Department of Mathematical Sciences
The University of Texas at El Paso, El Paso, TX   2022
Advisor: Dr. Amy Wagler
- Investigated the impact of thresholding strategies on graph theory-based network models derived from resting-state fMRI data
- Compared standard thresholding with advanced approaches using soft and hard covariance estimation
- Analyzed how preprocessing choices influence the distribution of key centrality metrics in brain connectivity graphs

Projects

Social Network Analysis on Pre-Service Teachers   August 2023 – August 2025
Mentor: Dr. Amy Wagler
- Use of network analysis to compare students' social networks in two teacher preparation programs

Skills Link Series   October 2023 – June 2024
Mentor: Dr. Amy Wagler
- Collaborating with the El Paso Community Foundation on survey design and implementation to evaluate and improve community-based technology workshops
- Supporting efforts to enhance digital literacy and workforce development in the El Paso region

Prevalence of Homelessness in Veterans   2022 - 2025
Mentor: Dr. Emre Umucu and Dr. Amy Wagler
- Use of moderation analysis and regression analysis to identify key factors contributing to homelessness in veterans

Visualizations By Josefina   Ongoing
Link: https://visualizationsbyjosefina.wordpress.com/
- Personal portfolio showcasing original data visualizations focused on clarify, accessibility, and storytelling

- Current project: *AOMG Mini Project*—a directed network of artist collaborations within AOMG, an entertainment company that serves as a hip-hop and R&B record label and artist management
- Demonstrates the application of network science and design in entertainment and cultural analytics

Publications

- Umucu, E., Wagler, A., Tsai, J., Perrin, P., Beaven, P. S., Hernandez, H. J., Herrera, M. J., Al-Hanna, N. F., Piplai, A., Cheever, K., Niemiec, R., & Lee, B. (in press). *Shielded by strength: How character strengths buffer the link between veteran status and homelessness in a national sample*. Journal of Positive Psychology. https://doi.org/10.1080/17439760.2025.2581997
- Hernandez, H., Mein, E., and Wagler, A. *Multi-modal Social Network Analysis in a Teacher Preparation Program*. (Submitting for publication)

Conferences

Protecting Data Privacy in Social Network Studies Using Synthetic Data

Poster Presentation, SIAM Conference on Mathematics of Data Science – Atlanta, GA   October 2024
Link: https://hjhernandez.shinyapps.io/siam2024/
Co-Author: Dr. Amy Wagler

- Presented methods for generating and evaluating synthetic social network data using probabilistic modeling and deep learning approaches to preserve privacy in longitudinal studies for sensitive data

Capacity-building assistance for communicable disease surveillance

Poster Presentation,
¡Viva La Salud! UTEP's College of Health Sciences' Health Disparities Conference – El Paso, TX   September 2024
Link: https://hjhernandez.shinyapps.io/VivaLaSaludApp/
Mentor: Dr. Amy Wagler

- Developed an end-to-end data pipeline to clean and standardize El Paso's influenza surveillance data (2018-2024), resulting in a public-facing dashboard that supports disease monitoring, public engagement, and health equity efforts

Presentations & Workshops

El Paso Community College Annual Connecting the Dots Workshops

Logarithms   August 2023

- Facilitated the understanding of logarithms

Set Theory   August 2022

- Facilitated the understanding of set theory
- Decipher mathematical logic of truth tables

Math 1324: Financial Equations   August 2021

- Facilitated the understanding how and when to use financial equations

Awards

UTEP Visualization & Interactive Collaboration Competition   April 2023
Team: Connected Nodes
Link: http://hjhernandez.shinyapps.io/DataVis/
Mentors: Dr. Amy Wagler & Dr. Erika Mein
Developed an R Shiny app that depicts a series of network graphs showcasing the changes that occurred before and after a two-year research training program. In particular, the network models depict latent structures of identity, self-efficacy, and self-concepts for students undergoing biomedical research training at UTEP.