

Alfredo González-Espinoza

| Data Scientist | Quantitative Researcher | Complexity Scientist |

About me

I am a multiskilled professional with a background in Chemistry, Physics and Computer Science. I have 10+ years of quantitative research experience. I use my analytical and technical skills to solve academic and business data-oriented problems with innovative interdisciplinary approaches.

Strengths & Skills

Continuous learning • Intellectual curiosity • Attentive listener • Self awareness

Areas of expertise

Statistical Analysis • Hypothesis Testing/Causal Inference
• Network/Graph Theory • Time Series Analysis • Machine Learning • Natural Language Processing

Technical Skills

Julia (Makie, Plots, Flux, MLJ, DataFrames) • Python (Pandas, Numpy, TensorFlow, PyTorch, Scikit-learn, NLTK, spaCy, scipy) • Linux, Bash, LaTeX, Git, SQL, Jupyter Notebook, MLOps

Languages

Spanish: Native
English: Proficient

Interests

Amateur cellist/musician • Science communication • Neuroscience
• Photography • Cinema • Videogames • Soccer

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spiralizing

WORK EXPERIENCE

2019–2022

Research Scientist

UNIVERSITY OF PENNSYLVANIA • Philadelphia, USA 📍



- Collected, cleaned and processed data from multiple sources and in variable formats: 1) 100,000+ MIDI, musicXML files. 2) Curated data-set of 27b of data points (track listenings) to construct time series for ~ 600k Last.fm users over 10 years.
- Developed mathematical and probabilistic models and metrics to identify and quantify musical features.
- Designed experiments and implement computational algorithms for hypothesis testing.
- Developed software and deployed it on Github.
- Wrote first-author manuscripts for publication, results featured in the journal Scientific American.

2018–2019

Research Scientist

NATIONAL INSTITUTE OF GENOMIC MEDICINE • Mexico City, MX 📍



- Developed a novel hybrid data-driven machine learning algorithm to identify communities of statistically dependent genes.
- Build and manipulate datasets from database with sql
- Performed advanced statistical analysis quantifying genomic features using information measures.
- Mentored PhD students with their research projects.
- Contributed to writing and deployment of software, and research manuscript for publication.

2011–2018

Research Assistant

INSTITUTE OF PHYSICAL SCIENCES, UNAM • Morelos, MX 📍



- Ran, monitored and organized computer simulations using monte carlo methods in molecular mechanics.
- Made protocols for reaction-diffusion experiments. Developed stochastic models and ran simulations for pattern formation systems.
- Organized two international trans-disciplinary workshops on Science, Art and Cognition.

OTHER & VOLUNTEERING

2014 – Present

Miscellaneous Data Science Projects

CENTER OF COMPLEXITY SCIENCES, UNAM • Mexico City, MX 📍



- Developed LSTMs for sentiment scores of tweets in Spanish for social network analysis at Tlatelolco Lab (digital lab for democracy), UNAM.
- Spatio-temporal analysis of high-resolution tracking data to quantify player performance for a Mexican professional soccer team (Pachuca FC).
- Characterization of usage and growth of the bike sharing system in Mexico city with Network Theory. Results presented in LaNet 2017 conference.

2009–2019

Assistant Conductor/Principal Cellist

OSJEMMIC (YOUTH ORCHESTRA) • Morelos, MX 📍



- Fostered and maintained an inclusive and diverse environment.
- Taught introductory music reading and playing to new members.
- Conducted weekly rehearsals with chamber and full orchestras.
- Organized concerts and drafted concert programs.

EDUCATION

2014 - 2018

PhD in Science (Physics) Universidad Autónoma del Estado de Morelos (UAEM), MX, *Graduated with honors*

2011 - 2014

Master of Science (Physics) UAEM, MX

2005 - 2011

Bachelor of Science (Chemistry) UAEM, MX

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