ALFREDO GONZÁLEZ-ESPINOZA

PhD / Postdoctoral Researcher

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EXPERIENCE

Postdoctoral Researcher

University of Pennsylvania

April 2019 – Present | Philadelphia, USA

- I am a postdoctoral researcher in the mathematical biology group
- I study different aspects of music, from structural properties to innovation and cultural evolution

Postdoctoral Researcher

National Institute of Genomic Medicine

October 2018 – March 2019 | Mexico City, Mexico

- I worked in the computational genomics lab
- I studied gene-expression correlations in breast cancer

PROJECTS I HAVE WORKED ON

Evolution and innovation in music scores

University of Pennsylvania

I process and analyze thousands of music scores in digital format, looking for trends in innovation and characterizing composers and musical periods using tools from stochastic processes and information theory.

Cultural evolution in music listening histories

University of Pennsylvania

I constructed time series of listening histories (songs of what people listen) from LastFM platform consisting in more than 600k users and more than 3Billion of listenings. We use the data to quantify frequency dependent selection with an inference methodology to understand how people choose what they listen.

Gene co-expression in breast cancer

National Institute of Genomic Medicine

I developed a hybrid clustering method, using tools from random matrix theory and the $k-$medoids algorithm. We used gene expression data for breast cancer to identify groups of genes that behave similar, finding patterns in different chromosomes and malignancy of the disease.

Nonlinearity and irreversibility in music scores

Institute of Physical Sciences

During my PhD I analyzed thousands of music scores, constructing univariate and multivariate time series. Using tools and concepts

MY LIFE PHILOSOPHY

"Enjoy every moment in life, have fun in what you do and never lose curiosity."

STRENGTHS/SKILLS

Creative thinker | Eager/Fast learner | Driven by curiosity

Julia | Computer Simulations | Linux | Python | Statistical Analysis | Inference | NLP | Time Series Analysis | Bash | Hypothesis Testing | Machine Learning

Programming skills/packages:

Bash, SSH, Git, SQLite, PostgreSQL, JSON, Spark, Jupyter notebook, Pluto notebook. **Python:** Pandas, Numpy, PyPlot, Keras, TensorFlow, Pytorch, Scikit-learn, NLTK,spaCy, scipy, music21. **Julia:** DataFrames, Flux, Plots.

LANGUAGES

Spanish ●●●●●

English ●●●●◐

EDUCATION

Ph.D. in Science (Physics)

Universidad Autónoma del Estado de Morelos (UAEM)

September 2014 – August 2018

Thesis title: Music scores characterization from a complex systems perspective

M.Sc. in Science (Physics)

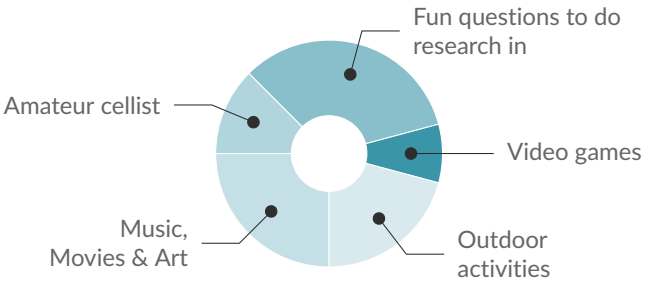
UAEM

Sept 2011 – June 2014

Thesis title: A discrete model for the Liesegang-type pattern formation in the reaction NH_3+HCl

from statistical physics and time series analysis we characterize the music scores identifying patterns over the years.

PERSONAL INTERESTS



B.Sc. in Science (Chemistry)

UAEM

Sept 2005 – June 2011

Thesis title: An *ab-initio* molecular potential for hydroxylamine

REFERENCES

Prof. Joshua B. Plotkin
@ University of Pennsylvania
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Prof. Gustavo Martínez-Mekler
@ Institute of Physical Sciences, UNAM
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