

EDUCATION

Michigan State University

Ph.D. Computational Mathematics, Science, and Engineering

- Engineering Distinguished Scholar

GPA: 4.0

East Lansing, Michigan

August 2024 - Present.

Universidad Autónoma de Baja California

Bachelor of Science in Applied Mathematics

- Best grade of the generation

GPA: 3.7

Ensenada, Baja California

August 2018 - December 2022.

RESEARCH EXPERIENCE

Graduate Research Assistant

Michigan State University

- Making a Low-rank approximation for the 1D1V, 2D2V, 3D3V Wigner-Poisson Equation.

East Lansing, Michigan

August, 2024 – Current

Volunteer (Unpaid) Research Assistant

Michigan State University

- Created a Petri Net model for the prediction of chemical reactions utilizing AlgebraicJulia utilizing a database of multiple chemical reaction paths
- Studied and utilized the Category theory formalism of Petri nets for the modeling of systems of differential equations

East Lansing, Michigan

January, 2023 – December 2023.

Undergraduate Research Assistant

Universidad Autonoma de Baja California

- Improved the mathematical model for the dynamic of oriented basal bodies when interacting with the polarized cytoskeleton of the multiciliated cells.
- Performed simulations of the improved model through computational fluid dynamics and characterized the patterns of the stages of the alignment of the cilia of the multiciliated cells using digital image processing.

Ensenada, Baja California

February, 2021 – August 8, 2023.

Undergraduate Research Assistant

Universidad Autonoma de Baja California

- Utilized Python to perform digital image processing for the detection of melanoma using multiple libraries and frameworks such as Tensorflow, Keras, and Scikit-learn. To perform the image processing, it was used a fractal signature to collect better information from the colors of the skin.

Ensenada, Baja California

June, 2020 – December, 2021.

Undergraduate Research Assistant

Universidad Autonoma de Baja California, MexNICA

- Utilized C++ and Python in the framework ROOT to perform a classification of particle collisions using multiple machine learning algorithms
- Utilized a Glauber Monte Carlo method to analyze the cross-section of particle collisions with data collected at the Multi-purpose detector (MPD) at JINR

Ensenada, Baja California

January, 2020 – January, 2021.

Internship: Undergraduate Research Assistant

University of California San Diego

- Analysed Doped Barium-Aluminum-Silicon materials with rare-earth elements with the x-Ray diffraction (XRD) machine
- Utilized Matlab to study the photoluminescence of the doped BAS materials for prospective damage control applications

San Diego, California

June, 2019 – August, 2019.

WORK EXPERIENCE

Data scientist Intern

Grupo de Ecología y Conservación de Islas(GECI)

- Build the repository Dimorfismo utilizing Docker.
- Developed scripts in Python, R and Bash that managed large amounts of data.

Ensenada, Baja California

June, 2021 – September, 2022.

- Developed a solution to the prediction of the sex and movement of Albatros in Isla Guadalupe using multiple machine learning tools as logistic regression, and random trees.

Consultant Workshop

KUMIAY

Ensenada, Baja California

November, 2020 – December, 2020.

- Developed a solution for the pedestrian flow in a commercial center in Japan, utilizing computer vision tools such as TensorFlow, OpenCV, Matplotlib and Keras. During this time I worked in the design of the solution, the implementation of the code, and the communication with the team in Japan since I'm bilingual.

TALKS AND PRESENTATIONS

The symposium Biomathematics 2023

Autonomous University of Baja California

Ensenada, Baja California

August 8, 2023.

- Presentation title: The Ciliar Alignment Index for Multiciliated Epithelial Cells revisited: A Mathematical Formulation and Data Analysis approach

2nd Computing/analysis workshop of the MexNICA

Autonomous University of Baja California

Ensenada, Baja California

July 3, 2020.

- Presentation title: Glauber Monte Carlo method for Au+Au and Bi+Bi collisions

ENLACE Poster presentation

University of California San Diego

San Diego, California

August 9, 2019

- Poster title: Doping of BAS materials with rare-earth elements for prospective damage control applications

COMMUNICATION

Member of the Physics society in Ensenada

November, 2018 – July, 2020

- Participate in events of Science Communication and performing activities to increase the social activities of the Faculty of Science

LANGUAGES

Spanish: Native

English: Fluent

Chinese, Mandarin: Beginner