

Juan de la Cruz

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EDUCATION

University of the Ozarks

Bachelor of Science in Mathematics and Chemistry, Minor in Economics

2018 – 2021

Clarksville, AR, USA

EXPERIENCE

Data Engineer

HSBC México, S.A.

May 2022 – Present

Cuauhtémoc, CDMX, MX

- Designed and executed advanced data architectures and data marts to support the data needs of multiple business units within the bank, elevating data stability, reliability, and delivering actionable insights for data-driven decision-making.
- Demonstrated exceptional interpersonal and communication abilities by engaging with stakeholders and cross-functional teams in the CRM/Analytics domains, efficiently gathering data requirements, and effectively communicating project designs to enhance the bank's operational efficiency and long-term sustainability.

Data Analyst and Health Informant

University of the Ozarks

Aug 2020 – Dec 2021

Clarksville, AR, USA

- Built tools for automated collection to create data visualizations and dashboards for the university's business unit, marketing department, and institutional research.
- Created new, experimental frameworks to collect data from Salesforce CRM environment.

RESEARCH

Research Assistant - XSEDE Empower Program Fellow

National Science Computational Institute

May 2021 – Dec 2021

Fayetteville, AR, USA

- Performed 5,000 2D in-compressible turbulent-mixing simulations using the Arkansas High-Performance Computing Center (AHPCC) and Stampede2 from the XSEDE computational resources to assess the efficacy of Fourier Neural Networks in simulating the Rayleigh-Taylor (RT) instability.
 - Built a database of simulations of the RT instability with Large Eddy Simulations with and without the subgrid-scale model and investigated the numerical differences using the VisIt package.
- Mentor(s): Dr. Tulin Kaman [Lab Website]

Research Assistant - INBRE Summer Research Fellow

University of Arkansas

May 2021 – Jul 2021

Fayetteville, AR, USA

- Programmed Metropolis and Subspace Sampling Monte Carlo methods Algorithms in C to simulate a system of particles under the canonical ensemble with 10^9 iterations.
 - Executed Chi-Square analysis to evaluate the performance of several MC algorithms in a double-well potential with a high energy barrier.
- Mentor(s): Dr. Feng Wang [Lab Website]

Research Assistant - CIMAV Summer Research Fellow

Advanced Materials Research Center

Jun 2019 – Jul 2019

Chihuahua, Mexico

- Performed research in the 15th Summer Research Program at CIMAV in the computational crystallography lab.
 - Introduced an automatic-fitting option for various parameters in a 2D X-ray diffraction novel software package (ANAELU) through genetic algorithms. [Poster]
- Mentor(s): Dr. Luis Fuentes Montero, Dr. Luis E. Fuentes Cobas, PhD student: Edgar Eduardo Villalobos Portillo

PROJECTS

FlowChecked | *Python, JavaScript, Node JS, HTML/CSS, Git*

Website, GitHub

- Implemented Navier-Stoke equation to build 2D simulation of the spread of airborne viruses in indoor spaces.
- Applied the finite difference method to solve the NS equation in various layouts.

Pink Code | *Python, JavaScript, AWS, HTML/CSS, Git*

Website, GitHub

- Applied image enhancement operations like contrast, color-balance, and sharpening to get meaningful insights from a dataset of mammography scans.
- Created a convolutional neural network to classify mass lesions as benign or malignant with 93 % of accuracy.

TECHNICAL SKILLS

- **Programming languages:** Python, C/C++, SAS, SQL, MATLAB, R, HTML/CSS, JavaScript.
- Tools & Utilities:** HPC (AHPCC & Stampede2), Google Cloud Platform, AWS, Git, Tableau, L^AT_EX, VS Code.
- Software:** AutoDock Vina, Spartan Student Version, ChemDraw , ChemSketch, visIt, Microsoft Office.
- Languages:** Spanish (Native), English (Fluent).

LEADERSHIP POSITIONS

- President of Ozarks Coding Society** 2020 - 2021
- Oversaw on-campus cryptographic competition to motivate the general student population to improve their analytical and problem-solving skills.
 - Coordinated several club meetings with 23 students to discuss and propose solutions to several coding problems.
- President of Ozarks Mathematical Society** 2019 - 2020
- Headed weekly club meetings with 15 students to solve math puzzles in number theory, algebra, and advanced calculus in preparation for the state math competition.
- President and Founder of Scientific Youth Tabasco** [Facebook Page] Summer, 2018
- Started and operated a non-profit to inspire lifelong engagement in science in under-represented and marginalized communities at Tabasco, Mexico
 - Motivated 50 students high school students to study science through weekly workshops and 2 talks.

AWARDS AND SCHOLARSHIPS

- Outstanding Mathematics Student Award** May, 2021
University of the Ozarks, Clarksville, Arkansas, USA
The outstanding mathematics student award honors students for outstanding achievement in the study of mathematics.
- 3rd Place Award, COVID-19 Data Challenge: Life and Work in Border Communities** Nov, 2020
University of California San Diego, The Border Solutions Alliance & The West Big Data and Innovation Hub
Led multidisciplinary team to create FlowChecked, an airflow simulation program to predict the propagation of airborne viruses in closed spaces using differential equations.
- 1st Place Award, CdeCMx Challenge: Health and Environmental Impact** Aug, 2020
Clubes de Ciencia, Mexico
Led multidisciplinary team to analyze the epidemiological outbreak of COVID-19 in Mexico and Geo-spatial Analysis of COVID-19 related tweets.
- 1st Place Award, Arkansas Undergraduate Mathematics Competition** Mar, 2019
Arkansas, USA
Placed first in an annual state-wide mathematics team-based competition consisting of a three-hour 10-question test that emphasized problem-solving skills in the areas of real analysis, number theory, and abstract algebra.
- 2nd Place Award, Annual Arkansas Phi Beta Lambda Competition: Statistical Analysis** Apr, 2019
Phi Beta Lambda, USA
- 2nd Place Award, Integration Bee Competition MAA OK-AR Section** Apr, 2019
Mathematical Association of America, USA
Placed second among 80 undergraduate students from Oklahoma and Arkansas universities.
- 2nd Place Award, Math Jeopardy Competition MAA OK-AR Section** Apr, 2019
Mathematical Association of America, USA
Place second among 17 teams from various Oklahoma and Arkansas universities.
- Walton International Scholarship: Full Ride Scholarship** Jan, 2018
Walton International Scholarship Program, Mexico
A scholarship that provides free college education for the brightest and most capable students from Central America and Mexico - WISP Class 2021.