

# Juan Pablo MALDONADO CASTRO

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[github.com/DancingIguana](https://github.com/DancingIguana)

## EDUCATION

### Universidad Nacional Autónoma de México

Bachelor of Science in Information Technologies for Sciences

Graduating in October 2023

GPA 99.5/100

## WORK EXPERIENCE

### Microsoft

Software Engineer Intern

Redmond, Washington, USA (virtual)

June 2022 - August 2022

- Designed and implemented an internal tool using the Azure DevOps REST API, and different Machine Learning related technologies to improve an aspect of the organization related to organization of tasks under Azure DevOps boards.

## MAJOR PROJECTS

### Melody Generation Neural Network

May - June 2022

Implemented a LSTM neural network using Pytorch and fastai and used an existing NLP model to generate musical notes that form a melody.

- Cleaned and preprocessed data for representing musical notes of a MIDI file as a valid input for the neural network.
- Implemented and trained a LSTM neural network using the libraries of Pytorch and Fastai.
- Tested and implemented a GPT-2 model using HuggingFace's tools, and applied them to melody generation.
- Displayed the results using the library of music21 and some self implemented data post-processing done in Python.

### Mental Health Data Analysis

January 2022

A data analysis project which consisted in visualizing and interpreting depression, anxiety and stress in people that took a survey related to this topic (extracted from a Kaggle dataset).

- Used Python's Pandas library for manipulating and accommodating all of the data.
- Used different clustering techniques (frequent patterns, association rules and K-means clustering) with Python libraries (Sklern, Mlxtend and Yellowbrick) to find different kinds of user profiles based on their personality, mental health and general information.
- Made an interactive webpage Dash app where it's possible to visualize the different kinds of data from the project. This includes an interactive K-means clustering visualization.

### 2D Dungeon Game

November 2021 -

January 2022

A video game project where the main objective is to complete a small level where the player faces-off enemies through turn-based combat.

- The game was designed with the Unity 2D Engine.
- Developed a combat system based on a finite state machine in C#.
- Kept track of different characters each with unique properties throughout the game. This involved storing data related to movesets, health, types of weaknesses and strengths, and other things related to turn-based combat games.

### N-body Simulation

November 2021 -

January 2022

An implementation of the numerical solution to the N-body problem. The purpose of this project was to simulate and visualize the planetary orbits of the Solar System.

- Extracted data of the Sun, planets, and other celestial bodies within the Solar System using NASA's Horizons System API. It consisted mainly in body masses, position coordinates and velocity vectors.
- Implemented the numerical solution to calculate the orbits of each body in the system using C++.
- Displayed the results (the orbits) using Python's Matplotlib 3D plotting tools.

## SKILLS

### PROGRAMMING LANGUAGES

3 years: Python

6 months: C++

### TECHNOLOGIES

HTML, CSS, Git, SQL, Unity2D

Python Libraries: Pandas, Matplotlib, Numpy, Seaborn, BeautifulSoup, Sklearn, Dash, Pytorch, Fastai

### LANGUAGES

Spanish: Native

English: Advanced (C1 - TOEFL ITP)

### AWARDS

Finalist ICPC Mexico 2021

