MIHIR JAGTAP

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ACADEMIC QUALIFICATION

Bachelor of Science - Computer Science and Data Science **Sep 2020 - May 2024**
University of Wisconsin-Madison **CGPA: 3.874/4.000 (until 6th semester)**

- ***Dean's List Recognition in Fall 2020, Spring 2021, Fall 2021, Spring 2022, Spring 2023***

RESEARCH EXPERIENCE

Cloud Based Prediction Tools for Materials Properties **Jan 2022 - May 2023**
Informatics Skunkworks, Computational Materials Group, Dept. of Materials Science & Engineering, UW-Madison. Guide: Prof. Dane Morgan

- **Developed a machine learning model for enthalpy prediction from SMILES strings; while retraining the Alfabet Model on QM9 was problematic, a promising model from Kaggle was optimized for the specific target property.**
- **Achieved comparable results to published papers with the DimeNet model; the Cubic Crystal Space Group model runs error-free on Foundry with enhanced usability through an integrated preprocessor.**
- **Developed a PyTorch-based neural network for predicting the band gap of organic compounds; proposed solutions include creating a custom preprocessor for Foundry compatibility and converting data processing from PyTorch's DataLoader to DataFrame.**

Assessing Generative Models for Predicting Materials Structure and Properties **Jun 2023 - Present**
Informatics Skunkworks, Computational Materials Group, Dept. of Materials Science & Engineering, UW-Madison. Guide: Dr. Benjamin Afflerbach & Prof. Dane Morgan

- **Assessing the Crystal Diffusion Variational AutoEncoder model with many datasets to generate desired and specific material structure and properties.**
- **Developed a python script to generate candidate structures and visualize the lattice structure.**

PROFESSIONAL EXPERIENCE

Project Assistant & Software Developer **April 2022 - Present**
Dept. of Animal and Dairy Sciences ***Madison, WI***
Guide: Prof. Victor Cabrera

- **Developed the tool *Optimal Allocation of Nutritional Resources and Crop Planning in a Dairy Herd.* The tool, based on a linear programming model, is designed to facilitate optimal crop planning and feed allocation in order to minimize the total feed costs across a dairy farm.**
- **Responsible for the R&D of web-based tools that are crucial for performing data analysis and visualization with the use of statistical mathematics and linear optimization.**
- **Other responsibilities include maintenance of the website to ensure smooth User Interaction and User Experience.**

Computer Vision & AI Research Intern **May 2022 - Aug 2022**
CamfyVision Innovations ***Bangalore, India***

- **Worked in development of computer vision software using OpenCV & PyTorch CUDA. Image Enhancement: Modified existing CNN architectures and used image processing to enhance blurred images.**

TEACHING EXPERIENCE

Peer Mentor **Sept 2023 - Present**
Department of Mathematics, UW-Madison ***Madison, WI***

- **I am the In-Class Peer Mentor for the MATH 96 and MATH 112 courses. Responsibilities include planning for the syllabus to be covered for that day, helping students with questions and clearing their doubts.**

- **I am also a drop-in tutor at the Mathematics Learning Center, UW-Madison. Assisting students in Pre-Calculus and Calculus.**

Academic Tutor **Sept 2023 - Present**
ACTS, Division of Diversity, Equity & Educational Achievement (DDEEA) ***Madison, WI***

- **Peer-to-peer tutoring. Assisted students with Math 221 and CS200.**

PROJECTS

Join Algorithm **May 2023**
https://github.com/MihirJagtap/Join-Algorithms

- **In this project, I implemented, tested, and benchmarked a disk-based join algorithm. The goal is to efficiently use memory and disk resources to return the answer to the join query.**

SQLite Page Cache **Apr 2023**
https://github.com/MihirJagtap/SQLite-cache

- **The project involves customizing SQLite's pager by implementing two new page replacement algorithms in the page cache component, which handles the memory management of database pages, including dynamic resizing, unpinned page discarding, page ID reassignment, and bulk discarding within ID ranges.**

VR-Toolkit **Jan 2023**
Code: ***https://github.com/MihirJagtap/VR-Toolkit***
Website: ***https://sites.google.com/wisc.edu/vr-toolkit/home***
Guide: ***Prof. Mohit Gupta***

- **A group project which proposes a VR software stack aims to enhance visual accessibility for people with low vision by offering features like text magnification, color contrasting, image captions, and text-to-speech, which can be integrated into VR headsets or specialized glasses.**

Computer Vision Apps **Dec 2022**
https://github.com/MihirJagtap/Computer-Vision-Apps

- **This project uses statistical methods and mathematical based models to implement computer vision apps mainly object tracking, image mosaicking, detecting straight lines, image refocusing and burning an image. Tools: MATLAB, Python, neural networks**

Multiple Hands Raised Detection **Jul 2022**
https://github.com/MihirJagtap/Multiperson-Hands-raised-detection

- **This ML software implementation can be used in educational settings or large halls to quantify people raising hands. Tools: OpenPose, Python, CUDA, and Tensorflow**

Country Happiness & HRD Analysis **May 2022**
https://github.com/MihirJagtap/Country-Happiness-HRD-Analysis

- **The report aims to compare Western Europe's mean happiness score with the global average and examine the correlation between a particular country's freedom and its happiness score.. Tools: R, Linear Regression, Statistical Analysis**

SKILLS

Languages	**Java, Python, R, SQL, MATLAB, PHP, HTML, CSS, C, C++, JavaScript, LaTeX**
Frameworks	**Flask, React, Shiny**
Tools/Platforms	**Git, OpenCV, PyTorch, Tensorflow, Linux, Windows**

EXTRA-CURRICULAR ACTIVITIES

BadgerFly **April 2022 - Present**
Software Development team member ***Madison, WI***

- **Functionality and software and maneuvering operation on prototype. Skills : Python, ROS**