KUWAR KAPUR

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EDUCATION

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY　　　　　　　　　**INDIA, DELHI**
Bachelor of Technology in Mechatronics　　　　　　　　　　　AUGUST 2019-JULY 2023

RESEARCH EXPERIENCE

Xulab, Carnegie Mellon University　　　　　　　　　　　　**Pittsburgh, USA**
Research Intern　　　　　　　　　　　　　　　　　　　　　*May 2023- Present*

- Working under the guidance of [Prof. Min Xu](#) and [Dr. Ali Dabouei](#) on projects based on Bacteria Growth analysis.
- Conducting multiple experiments on different environments and datasets using state-of-the-art methods such as Transformer Encoder Networks.
- Implementing Video analysis tasks for bacteria gene modification analysis and performing lab automation.
- These techniques help us in understanding the significant period in a Bacteria's Life Cycle.
- **Proposed techniques are intended to be submitted to Publications like NAR & IEEE.**

WORK EXPERIENCE

Skylark Drones　　　　　　　　　　　　　　　　　　　　　**BANGALORE**
Machine Learning Engineer　　　　　　　　　　　　　　　*October 2023- Present*

- Successfully implemented **live feed YOLOv8 video analytics** with a mAP of 61% for real-time monitoring and analysis, contributing to advanced video processing capabilities.
- Developed a comprehensive **Object Detection pipeline** for **geospatial data**, encompassing the entire workflow from orthomosaic processing to model deployment.

Machine Learning Intern　　　　　　　　　　　　　　　*July 2023- October 2023*

- Collaborated on **optimizing drone performance** at Skylark Drones by implementing multiple pipelines and gained valuable insights into **integrating AI** within the drone industry.
- Developed a **template matching** system for **Ground Common Points** (GCP) to improve object recognition and tracking capabilities.
- Enhanced **object detection & segmentation pipelines** using **point cloud** data, improving precision & accuracy by 20%.

FOODIFYY　　　　　　　　　　　　　　　　　　　　　　　**DELHI**
Co-Founder　　　　　　　　　　　　　　　　　　　　　*May 2022- June 2023*

- Foodifyy was a **machine learning-based health tech startup**. At Foodifyy we aimed to provide you with a new experience to learn more about what you are eating.
- At Foodifyy, served as **Co-Founder**, overseeing multiple facets of the company's growth. Responsibilities included implementing various **machine learning** algorithms, managing the entire ML tech team, and laying the foundation for Foodifyy's technology infrastructure.
- Team **Foodifyy** was one of the 81 startups **shortlisted amongst 1500+** applications for the Google Startup Bootcamp.

IMAGOAI　　　　　　　　　　　　　　　　　　　　　　　**DELHI**
Machine Learning Intern　　　　　　　　　　　　　*November 2022- January 2023*

- Learned a lot about **Hyperspectral Imaging (HSI)**. Worked with an **automated image processing pipeline** and artificial intelligence platform to test, analyze, and monitor the quality of raw or manufactured food
- Implemented **Autoencoder and variational Autoencoder** to improve Mycotoxin classification results.
- Produced suitable **metrics** that involved a lot of experimentation around **Mycotoxin classification**.

RJWADA　　　　　　　　　　　　　　　　　　　　　　　**DELHI**
Computer Vision Developer　　　　　　　　　　　　　*July 2022-January 2023*

- Was part of the core team and built **state-of-the-art ML algorithms**.Worked with the whole pipeline to create a smooth & **accurate inference** process.
- Worked closely with the entire pipeline to optimize performance and accuracy.
- Implemented various ML Algorithms to facilitate the use of end-to-end **3D, AR, and Virtual Try-on** solutions.

MLH　　　　　　　　　　　　　　　　　　　　　　　　　**Remote**
Prep Fellow　　　　　　　　　　　　　　　　　　　　*July 2022- August 2022*

- Develop the Jekyll website template together as a pod for a portfolio website of each member.
- Using OpenWeather API Implemented a React App that works with various APIs (Application Programming Interfaces) with added utilities as a pod.

NVIDIA   **Remote**

Deep Learning Intern   *January 2022- September 2022*

- Worked with **GPU-accelerated Recommender System** models and Merlin Toolkits.
- Improved the overall results of **Wide and Deep architecture** by **5**% with **hyperparameter tuning.**
- Produced suitable hyperparameters for novel architectures in the **RecSys** domain.
- NVIDIA DLI Certifications for **Fundamentals of Accelerated Data Science** Competency.

PROJECTS

Tinkering with LLMs| *Generative AI*
- Developed and curated projects within the Tinkering-With-LLMs GitHub repository, dedicated to exploring various Large Language Models (LLMs).
- Executed multiple projects focusing on fine-tuning and text generation with RAG integration, showcasing diverse aspects of LLMs.

Assessing Car Damage with CNN| *Computer Vision*
- Assessing Car Damage with Convolutional Neural Networks Created a web app that can be used in the process of the personal auto claims process with computer vision and deep learning. Identifying damage location and severity with accuracies of 77% and 71% respectively, using transfer learning on VGG16. Deployed web app with Flask and Bootstrap for real-time car damage evaluations

DivyaChitta| *Web App Development*
- Created A VR Mediation platform while participating in a hackathon by HACKON 2.0. This project has all the features that let you meditate properly in VR mode. In this, I developed a Music Recommendation system that works by Analysing the current mood of the user.

GourmetVision: Revolutionizing Food Perception| *Deep Learning*
- Developed a food perception pipeline for FOODIFYY, integrating segmentation of different food items, volume estimation, and depth mapping using 3D Pointcloud analysis for enabling accurate portion size assessment. Enabled accurate analysis of food images by implementing a hierarchical classification, enhancing accuracy in categorization and insights. Hosted the API on AWS EC2, ensuring uninterrupted service availability for processing of 3D computer vision models.

Autonomous Fire Fighting Robot| *Robotics*
- By using computation and spatial object detection to autonomously guide our robot to avoid obstacles and reach the place of hazard & upon reaching the place of incident extinguish the fire based on the input it gets from environmental variables using multiple sensors. It can quickly detect and put out fires before they become catastrophic.

TECHNICAL SKILLS

Languages: Python, C++, Bash, Embedded C
Frameworks and Libraries: Tensorflow, PyTorch, Keras, OpenCV, NumPy, Scikit-Learn, ROS
Tools: Git, AWS, GCP, Docker, MongoDB, HTML, CSS
Embedded Devices: Arduino, Raspberry-pi

RELEVANT COURSEWORK

Mathematics: Differential Calculus and Equations, Integral Calculus and Difference Equations, Discrete Mathematics, Probability Theory.
Artificial Intelligence: Deep Learning, natural language processing, vision, and speech processing, computational learning theory, Explanation based learning

ACHIEVEMENTS

GOOGLE DEVELOPERS Startup Bootcamp: Out of the **1500**+ teams **80 teams** were selected for the **boot camp** in which my team was shortlisted across 4 bootcamp cities for our app Foodifyy.
SDC GGSIPU USS Hackathon (HackedCode): **Won the hackathon** hosted by SDC GGSIPU USS made a platform for all the health buffs out there.
IITB-ISRO-AICTE-MAPATHON: Took part in Mapathon organized by **IIT BOMBAY AND ISRO** and was recognized as a notable participant with a rank in the **top 500**