Yash Diggikar

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Experience

Research and Development Intern Tata Consultancy Services

- Worked on a research project focused on multi-objective optimization within the semiconductor industry, aiming to enhance wafer yield and operational efficiency.
- Leveraged machine learning libraries, including pymoo, scikit-learn, and TensorFlow, to develop and deploy multi-objective optimization algorithms tailored for wafer yield optimization.
- Executed data analysis using PCA, clustering, and machine learning models to uncover insights such as early defect indicators and maintenance patterns, supporting anomaly detection and predictive maintenance.

Research Assistant Center for Accelerated Real Time Analytics (CARTA), UMBC **Advisor:** Dr. Milt Halem

- Conducting experiments with FourCastNet v2 (Spherical Fourier Neural Operators) for weather forecasting using NVIDIA's Modulus framework.
- Implementing autoregressive forecasting experiments and truth-insertion techniques using ERA5 climatology data.
- Conducting large-scale ML experiments on HPC clusters, including ensemble forecasting and performance evaluation via RMSE and ACC metrics.

Teaching Assistant - Spring 2025 University of Maryland, Baltimore County (UMBC)

- Teaching Assistant for Operating Systems (CMSC 421); assisted students with programming projects on threading, file systems, and networking.
- Managed setup and maintenance of student virtual machines (VMs), including account creation, permissions configuration, and technical troubleshooting.

Projects

AI Surgical Navigator | *YOLO, ResNet* Source Code

- Developed an AI-powered application for surgical instrument and procedure detection using ResNet for semantic segmentation and YOLO for instrument detection on annotated surgical videos and images from operating room datasets, enabling accurate identification and tracking of instruments in real-time.
- Built a responsive front-end using React to visualize real-time results from surgical videos. Utilized MongoDB as the database and Node.js as the backend framework for server-side operations.

Neural Bird Classifier | *Image Classification, TensorFlow, Flutter* Source Code

- Achieved a 95% accuracy by training an InceptionV3 model on a publicly available dataset of bird species.
- Developed a mobile application using Flutter, leveraging the trained model to accurately predict bird species.

Skin Cancer Detection Using Deep Learning | *Deep Learning, OpenCV*

- Developed a custom CNN for skin cancer detection from camera-captured images. Demonstrated that data augmentation (rotations, flips, brightness adjustments) and feature extraction (edge detection, color normalization, spatial filtering) enhanced robustness and accuracy, outperforming standard models like ResNet, VGGNet, and InceptionNet by better handling diverse image conditions unique to skin lesions.

Education

University of Maryland, Baltimore County Baltimore, Maryland
Master of Science in Computer Science, 2024 - present (In the process of converting to PhD program in CS)
GPA - 3.56/4.0

Keshav Memorial Institute Of Technology Hyderabad, Telangana, India
Bachelor of Technology in Computer Science (AI-ML), 2020 - 2024 GPA - 7.0/10

Skills

Languages	:	Python, Java
Frameworks	:	PyTorch, TensorFlow, Node js,Keras, scikit-learn, pymoo, spaCy, pandas, matplotlib
Skills	:	Object-Detection, Image Classification, CNNs, RNNs, GAN, **Transformers**, Data visualization, Machine learning, Problem solving, Natural Language Understanding, Front-end

Additional Training and Experience

- Participated in **Smart India Hackathon 2022**, in which I proposed an app to help the visually Impaired.
- Was a Core Member,**Recurse** Technical Club
    - Developed machine learning models using scikit-learn.
    - Spearheaded technical projects, actively collaborating with peers to drive innovative solutions in machine learning, fostering a culture of knowledge sharing and hands-on experimentation.