

ANUBHAV DE

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EDUCATION

JOHNS HOPKINS UNIVERSITY | Baltimore, Maryland

Master of Science in Engineering Degree | Expected 12/2025

Major: Computer Science

VELLORE INSTITUTE OF TECHNOLOGY | India

Bachelor of Technology | 08/2024 | **8.9/10**

Major: Computer Science & Engineering

TECHNICAL SKILLS

Programming Languages & Scripting Languages: Python, C/C++, R, Latex, JavaScript, HTML, CSS, Java

Operating Systems: Debian Linux, Arch Linux, Windows

Libraries: TensorFlow, PyTorch, Keras, Scikit-Learn, Scikit Image, OpenCV, Pillow, Numpy, Pandas Matplotlib, JAX, Scipy, Seaborn, HuggingFace, OpenAI Gym, Stable Baselines, TFAgents, NVIDIA Modulus, DeepXDE

Databases: MySQL, MongoDB, Redis, SQLite, NoSQL

Tools/Platforms: Git/Github, Docker, AWS (EC2, S3, Lambda, Sagemaker), Microsoft Office Suite, Google Workspace, Jupyter Notebook, Hadoop/Spark, PowerBI, Tableau, Azure

Core: Software Design, Machine Learning, Deep Learning, Computer Vision, Data Science, Data Visualization, Data Analysis, Data Engineering, Large Language Models, Generative AI, Diffusion Models, NLP, Recommendation Systems, Data Collection, Feature Engineering, Communication, Problem Solving, Big Data

WORK EXPERIENCE

Machine Learning Research Intern | National Chin-Yi University Of Technology (National Applied Research Laboratories) | Taiwan | September 2023 - March 2024

- Demonstrated applicability of Physics Informed Neural Networks (PINNs) with help of NVIDIA Modulus, DeepXDE, TensorFlow and PyTorch.
- Simulated on 5 geometries made of Polydimethylsiloxane (PDMS) with fine channels passing through to calculate Heat Flow and Heat Transfer between solid and fluid interfaces as per Navier-Stokes Equation for potential use in augmenting Computer Aided Design with Neural Networks.
- Collaborated with a cross-functional engineering team of 6 engineers to facilitate implementation of PINN, funded by the International Internship Pilot Program (IIPP), Taiwan.

Undergraduate Research Assistant | Vellore Institute Of Technology (VIT) | India | April 2023 - March 2024

- Conceptualized refining medical diagnosis with help of Neural Networks attaining 84.17% accuracy. Streamlined identification and segmentation of human body organs based on high-resolution histology images employing hybridized CNNs.
- Improved performance with higher accuracy and lower loss compared to 10 contemporary works with help of U-Net Architecture.
- Developed a hybrid deep neural network for skin disease classification, revamping prediction accuracy by 25% on dermatoscopy images with help of data augmentation, transfer learning, and ensemble models.

PUBLICATIONS

AI Applications in Sports Medicine: Unraveling the Influence of Physical Education on Sports Injury Outcomes

Global Innovations in Physical Education and Health (IGI Global)

Study and Investigation of Cloud Based Security Policies Using Machine Learning Techniques

IEEE, 2024 International Conference on Advancements in Smart, Secure and Intelligent Computing (ASSIC)

Hybridized CNN-Densenet Model for Dermatological Classification of Histopathological Skin Images

IEEE, 2024 International Conference on Advancements in Smart, Secure and Intelligent Computing (ASSIC)

An approach to the dermatological classification of histopathological skin images using a hybridized CNN-DenseNet model

PeerJ Computer Science

Chapter 11: Investigation of High-Performance Computing Tools for Higher Education Institutions Using the IoE Grid Computing Framework

Internet of Behaviors Implementation in Organizational Contexts, IGI Global

RELEVANT PROJECTS

Information Retrieval Based Medical Question-Answering | Johns Hopkins | Baltimore, Maryland | Fall 2024

- Fine-tuned Sentence-BERT with Multiple Negatives Ranking Loss, overhauling embedding quality and boosting retrieval accuracy by 19% over BM25.
- Processed 47,457 question-answer pairs from the MedQuAD dataset, enhancing retrieval accuracy for diverse question types, including Treatment, Diagnosis, and Side Effects.
- Optimized all-MiniLM-L12-v2 using mixed-precision training and AdamW, reducing computation time by 23% while maintaining high performance.
- Outperformed baseline models with a Mean Reciprocal Rank (MRR) of 0.812 and higher precision and recall metrics across multiple evaluation benchmarks.

Identify Thermostable Mutations In Enzymes Using Neural Nets | Vellore Institute of Technology | India | Spring 2023

- Utilized Novozymes dataset containing over 240,000 enzyme sequences to predict stability based on amino acid properties such as melting point after single-point amino acid mutation and deletion.
- Applied Convolutional Neural Networks to enhance enzyme stability predictions, accomplishing model accuracy improvements of up to 25% compared to baseline models.
- Attained a 0.88 R-squared score in predicting enzyme stability, demonstrating significant predictive accuracy for industrial enzyme applications.
- Optimized enzyme processes, increasing efficiency by 11% for biotech and pharma applications, supporting sustainable chemical production.

Identification Of Bird Vocalizations In Soundscape Recording | Vellore Institute of Technology | India | Summer 2022

- Employed a diverse dataset of bird calls of over 10,000 birds from Cornell's Lab of Ornithology for model robustness.
- Utilized Mel-Frequency Cepstral Coefficients (MFCCs) for numerical feature extraction from audio signals, boosting classification accuracy by 18% by capturing unique frequency characteristics to distinguishing sound patterns.
- Leveraged the VGG19 architecture on spectrogram representations of bird calls for transfer learning, improved classification performance and reduced training time by 50%.
- Executed model deployment with Flax, enabling flexible neural network construction and fine-tuning, contributed to achieving over 94.72% accuracy on validation set.

Integrated Web Application for Viral Pneumonia Diagnosis | Vellore Institute of Technology | India | Spring 2022

- Developed an interactive web application for managing dietary and nutritional needs, aimed at promoting healthier eating habits using Flask for backend and integrated a user-friendly frontend using HTML, CSS, and JavaScript for seamless user experience.
- Implemented a database system with Postgres and MongoDB to store and retrieve user data efficiently, ensuring personalized recommendations.
- Created a diagnostic module by leveraging the MosMedData dataset of Chest CT scans with COVID-19 related findings to detect viral pneumonia cases.
- Incorporated data augmentation techniques in diagnostic module, resulting in a 14% improvement in detection accuracy informed personalized dietary recommendations.
- Achieved a final accuracy of 89.29% and loss of 0.26 on validation set.

CERTIFICATIONS

- AI Programming with Python Nanodegree, Udacity (sponsored by AWS) Nanodegree.
- Machine Learning Fundamentals, Udacity (sponsored by AWS) Nanodegree.
- Deep Learning Fundamentals with Keras, IBM.
- PyTorch Basics for Machine Learning, IBM.
- Computer Vision and Image Processing Fundamentals, IBM.
- Deep Learning with Tensorflow, IBM.
- CS50's Web Programming with Python and JavaScript, HarvardX.
- CS50's Introduction to Artificial Intelligence with Python, HarvardX.
- Applied Machine Learning in Python, University of Michigan.
- Machine Learning Foundations: A Case Study Approach, University of Washington.