

Nikhil Reddy Yerragonda

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WORK SUMMARY

Demonstrated expertise in machine learning, including CNNs, GANs, deep learning, and large language models (LLMs), with applications in NLP, data analysis, and predictive modeling. Skilled in designing, training, and validating models using large-scale datasets across various domains. Proficient in preprocessing techniques like normalization, denoising, and feature extraction to enhance model robustness. Experienced in software development, integrating advanced algorithms into production systems, and optimizing data pipelines for accuracy and efficiency. Adept at UI/UX design, focusing on creating intuitive interfaces for AI-driven solutions. Strong background in computer vision, image analysis, and leveraging tools like Power BI for data visualization and decision-making. Collaborative and effective in interdisciplinary teams, delivering impactful, user-centric data-driven solutions.

EDUCATION

Master of Science (MS) in Computer Science

University of Alabama at Birmingham (UAB)

Jan 2024 – May 2025

GPA: 3.62

Relevant Courses: Machine and Deep Learning, Data Science, Cloud Computing, Computational Theory, Algorithms, Statistical Analysis, Advanced Data Processing, Computational Modeling, Software Engineering, Advanced Image Processing, Calculus, and Natural Language Processing (NLP/LLM).

Presentation and Submissions at Conferences: IEEE International Conference on Computer Science and Software Engineering, 2025 (CSASE).

Bachelor of Technology in Computer Science and Engineering

Guru Ghasidas Vishwavidyalaya (GGV)

Aug 2019 – June 2023

CGPA: 3.30

Relevant Courses: Python, Algorithms, Data Structures, Machine Learning, Neural Networks, Artificial Intelligence (AI), Computational Systems, Software Engineering, Computer Architecture, Embedded Systems, Digital Logic Design, Operating Systems, Database Systems, Networks, and Cybersecurity.

Presentation and Submissions at Conferences: ICLTEM 23, and ISPEC 21

TECHNICAL SKILLS

Languages: Python, HTML, CSS, SQL, PostgreSQL, JavaScript, Kotlin

Developer Tools: VS Code, Google Colab, Jupyter Notebook, Git, Android Studio

Technologies/Frameworks: Tensorflow, Pytorch, Flask, MongoDB, AWS, Jira, Splunk

EXPERIENCE

Machine Learning Intern at PanTech Solutions - India

June 2022 – July 2022

- Innovative Machine Learning Model Development: Designed and built cutting-edge models to tackle complex problems and drive results.
- Strategic Data Preprocessing and Feature Engineering: Crafted robust data pipelines and engineered features to enhance model performance and reliability.
- Precision in Algorithm Selection and Tuning: Applied a keen analytical approach to select and fine-tune algorithms, optimizing outcomes and ensuring accuracy.
- Rigorous Model Evaluation and Validation: Implemented thorough evaluation strategies to validate model effectiveness and ensure real-world applicability.
- Insightful Data Visualization and Interpretation: Transformed data into compelling visualizations, delivering clear, actionable insights that drive strategic decisions.

Research and Outreach Volunteer at PolyAgent – Remote

Aug 2024 – Present

- Contributed to the design and testing of open-source LLM AI agent frameworks, ensuring scalability, robustness, and user-friendliness.
- Implemented and debugged code modules to enhance the functionality and efficiency of AI agents.
- Conducted literature reviews and benchmarking to evaluate state-of-the-art AI models and their application in agent systems.
- Optimized algorithms for real-time decision-making and resource allocation in multi-agent systems.
- Processed and analyzed datasets to train and validate AI models used in agent-based applications. Developed scripts to automate data preprocessing and feature engineering tasks.
- Worked with the open-source community to troubleshoot issues, submit pull requests, and contribute to repository documentation. Participated in code reviews and provided technical feedback to ensure high-quality contributions.
- Assisted in creating technical tutorials and documentation for developers to onboard and utilize AI agent frameworks. Supported workshops by preparing hands-on coding exercises and troubleshooting participants' issues.
- Proposed and implemented prototype agent-based solutions for real-world problems, focusing on usability and ethical considerations.
- Evaluated the performance of various models and architectures in specific agent-driven applications like resource management or predictive analytics.

RESEARCH PROJECTS

Human Activity Recognition | Python, Detectron2, LSTM |

Aug 2021 – Nov 2021

- Seamlessly integrate Detectron2's object detection capabilities with LSTM's temporal modeling for comprehensive human activity recognition.
- Ensure the system is scalable and adaptable to various input sizes and types for robust performance in diverse environments.
- Conduct rigorous testing and validation to evaluate and enhance the accuracy of activity recognition across a wide range of scenarios.

Image-Based Search Engine | Python, TensorFlow, Keras, Flask |

Dec 2021 – Mar 2022

- Develop an image-based search engine that leverages VGG16 for feature extraction to facilitate image retrieval from a dataset.
- Employ VGG16 to encode input images into feature vectors and compare these vectors with those in the dataset to identify and rank similar images.
- Implement a robust comparison mechanism to ensure accurate retrieval of the most relevant images based on feature similarity.

- Optimize the search engine for efficiency and scalability to handle large datasets and provide quick search results.

Facial Detection using CNN | Python, MesoNet, MesoInception4 |

Aug 2022 - Nov 2022

- Develop a facial detection model that leverages pre-trained CNN weights and architectures, specifically MesoNet and MesoInception4, to assess the authenticity of videos.
- Analyze facial features and movements to detect potential signs of forgery or manipulation within video content.
- Integrate advanced algorithms to enhance detection accuracy and minimize false positives in identifying tampered videos.
- Implement a comprehensive evaluation framework to validate the model's effectiveness across various types of video manipulation and forgery techniques.

Video Forgery Detection Using a Hybrid Architecture | CNN, RNN, ML |

Dec 2022 – April 2023

- Develop a video forgery detection system using a hybrid architecture that combines Convolutional Neural Networks (CNNs) with Recurrent Neural Networks (RNNs) to enhance detection capabilities.
- Analyze diverse video features, including spatial and temporal information, to accurately distinguish between authentic and manipulated content.
- Leverage CNNs for feature extraction and RNNs for temporal analysis to improve the robustness and precision of forgery detection.
- Implement a rigorous evaluation process to assess the system's performance and effectiveness in identifying various types of video forgery.

Dynamic Portfolio Website Deployment with AWS EC2 | Leveraging JavaScript, HTML, and CSS |

Feb 2023-Mar 2023

- Objective: Design and develop a personal or professional portfolio website to effectively present your work, skills, and achievements, utilizing HTML for content structure, CSS for styling, and JavaScript for interactive and dynamic features.
- AWS EC2 Hosting: Deploy the website on an Amazon EC2 instance to leverage cloud-based scalability, ensuring that the site can handle increasing traffic and demand efficiently. Benefit from AWS's robust security measures to protect your website data and enjoy the flexibility to easily adjust server resources and configurations based on your needs.

Advanced Cloud-Based File Upload and Secure Sharing Platform | Leveraged multiple AWS Services, JavaScript |

May 2024 – Aug 2024

- Developed a Secure and Scalable System: Built a cloud-based file upload and sharing platform with a robust and scalable architecture, ensuring secure operations.
- Seamless User Experience: Enabled users to log in, upload files, and share them with up to five recipients via email with ease and efficiency.
- Reliable Storage and Automated Sharing: Implemented secure file storage using Amazon S3, with automatic delivery of download links to recipients through Amazon SES, orchestrated by a serverless Lambda function.
- 100% Accurate File Tracking: Integrated a DynamoDB table to maintain a precise record of all uploaded files, guaranteeing 100% accuracy in tracking and retrieval.
- Comprehensive AWS Integration: Leveraged multiple AWS services, including EC2 for hosting, IAM for access management, and Lambda for serverless computing, to deliver a highly reliable, scalable, and secure solution.

Blockchain Based E-Voting System Using Facial Recognition | React.js, Blockchain, Ethereum, MongoDB |

May 2024 – Aug 2024

- Developed an advanced online voting platform integrating blockchain technology with facial recognition to ensure maximum security and transparency showcasing the seamless integration of blockchain and AI, creating a secure, transparent, and user-centric voting system.
- Utilized MongoDB for efficient management of candidate, election, and user data collections.
- Deployed smart contracts using Truffle and Ganache, with MetaMask facilitating Ethereum-based transactions.
- Implemented user authentication through facial recognition, using Python libraries like OpenCV and face recognition, combined with email verification for added security.
- Provided detailed guidance on MongoDB configuration, smart contract deployment, and facial recognition setup, addressing challenges in dependency management.

Iterative Local & Global Approximated SVD for Image Denoising | Image Processing, Python, Modelling |

Aug 2024 – Dec 2024

- Enhanced the classic SVD algorithm for improved image compression and denoising, achieving a 15% increase in PSNR and a 12% boost in SSIM for medical and natural images.
- Implemented efficient sparse coding techniques, reducing data size by 30% without losing critical details. Improved noise reduction by applying iterative SVD-based methods, preserving fine structural details essential for diagnosis.
- Conducted extensive testing in Python across various noise levels and compression ratios, ensuring robust results.
- Reconstructed high-quality images suitable for medical applications with significant gains in both PSNR and SSIM metrics.

Multifold Fusion Attention Variant Network for Emotion Recognition | ML, Data Processing, Python, Transformers |

Aug 2024 – Dec 2024

- Integrated and synchronized EEG for multi-media emotion recognition and improved the accuracy by 7.12% compared to conventional MULT and transformer architectures.
- Integrated novel adaptive multi model fusion techniques don't rely on pre-extracted features saving computational time and memory by 8.24%.
- Trained end-to-end architecture combining EEG, audio and video modalities with multi-scale (fold) attention networks extracting spatial, global-local and channel characteristics paving way for emotion recognition in machine intelligence.
- Explored multi-model and singular-model learning for efficient media synchronization in both time and frequency domains.

ORGANIZATIONS

DataFrench Community

Aug 2024 - Present

- Active member, serving as a student mentor and competitor in data science and machine learning challenges.

Association for Computing Machinery @ UAB

Jan 2024 - Present

- Conducting workshops, codathons, and webinars. Technically collaborating with other chapters for the stationing the associations.