Vinay Kadam

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SKILLS

Programming:	Linux/Unix Scripting, Embedded C, C#, R, Python, Javascript, HTML, SQL, MATLAB.
Software Tools:	AzureML, AWS (SageMaker, ECR, EC2, S3, Lambda), GCP, Docker, Kubernetes, GitHub, Spark, MySQL, SQL Server, ImageJ, Amira, Slurm, Tableau, Microsoft Office (Word, Excel, Visio, Powerpoint).
Python Packages:	TensorFlow, Keras, PyTorch, Scikit-learn, Scikit-image, Matplotlib, Seaborn, Plotly, OpenCV, Pillow, NumPy, Jupyter Notebook, Pandas, Flask, MLflow.
Data Science:	Machine learning, Exploratory data analysis, Data wrangling, Data visualization, Feature engineering, Predictive modeling, Dimensionality reduction, Statistical modeling, Supervised learning, Pattern recognition.
Certifications:	Azure Data Scientist Associate (Microsoft), IBM machine learning essentials (IBM), Neural Networks and Deep Learning (deeplearning.ai), Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization (deeplearning.ai), PCB Designing with Arduino Prototyping (Eduvance), Microchip Master's (Microchip).

PROFESSIONAL EXPERIENCE

Artificial Intelligence Engineer Intern - Radicle AI (Reality AI Labs) – Remote **Mar 2024 - Aug 2024**

- Developed Generative AI solutions, building AI tools with LangChain, RAG, AI Agents, and Multimodal AI for enhanced interactive capabilities.
- Contributed to global open-source AI initiatives, shaping educational tools with real-world impact.
- Collaborated with team members to solve complex challenges and deliver impactful AI projects, fostering a supportive and innovative environment.

Research Assistant - (Machine Learning) The University of Texas at Dallas - Richardson, Texas **May 2022 - Dec 2023**

- Created robust feature extraction pipeline for light sheet microscopic imaging, achieving accurate segmentation for 3D cardiac structure analysis.
- Implemented a novel explainable ML algorithm that achieved 7x faster processing speed on GPU compared to unet.
- Enhanced ML algorithm performance by achieving an 82% accuracy, optimizing IoU, Dice, Precision and Recall through hyperparameter tuning and model development.
- Conducted quantitative analysis, translating complex results into compelling visualizations to substantiate improvements and accuracy in my research work.
- Leveraged advanced convolutional neural networks (CNN), including 3D Unet, ResNet-101, and LSTM networks, to significantly enhance the segmentation accuracy of zebrafish cardiac microscopic images by 85% and driving improvements in research.
- Designed and developed a software for microscopy imaging, allowing adjustment of model parameters and export of 3D structures for enhanced visualization.

Machine Learning Engineer - Eduvance - Mumbai, India **Jan 2018 - Dec 2021**

- Created an interactive AI software leveraging predictive modeling, resulting in a 25% improvement over previous versions.
- Designed and implemented predictive models using supervised learning algorithms such as regression models, ensemble models (decision trees, random forests), and SVMs to deliver actionable insights for large-scale datasets.
- Developed and deployed python scripts for analyzing and processing large datasets, supporting predictive insights to optimize production strategies.
- Automated the deployment and monitoring of predictive models in production through CI/CD pipelines, ensuring efficient and reliable performance.
- Optimized queries for data extraction, transformation, and loading, enhancing SQL database performance and efficiency.
- Responsible for driving industry-standard training programs in Data science for 500+ university-level students.

Image Processing Engineer - WeCan Educational Organization - Mumbai, India **Nov 2016 - Dec 2017**

- Developed and optimized algorithms for image processing and feature extraction, achieving a 20% increase in speed.
- Applied feature descriptor techniques (SIFT, SURF) to enhance object detection and image classification tasks.
- Implemented object detection models YOLOv2 and Faster R-CNN to accurately localize and identify objects in images.
- Deployed computer vision ML models on edge devices like Raspberry Pi to develop an application end product.
- Programmed embedded platforms like Arm Mbed, Microchip and Arduino for automation projects.
- Responsible for developing and maintaining curriculum and course projects for training programs on Machine Learning, Image Processing, and Embedded Systems (Arduino, ARM, Raspberry Pi) for 200+ undergrad students.

PUBLICATIONS

- Multi-scale imaging and analysis to elucidate cardiac structure and contractile function (Basic Cardiovascular Sciences Scientific Sessions 2023).
- 4D Light-sheet imaging and interactive analysis of cardiac contractility in zebrafish larvae (APL Bioengineering 2023).
- Interpretation of autism spectrum disorder through artificial intelligence (International Journal for Research in Applied Science and Engineering Technology 2020).
- Wrist band pulse oximeter (International Journal of Innovative Research in Science and Engineering 2016).

RECENT PROJECTS

- **Medical Insurance Claim Prediction App** [Link]
  Objective: Built a predictive model to estimate insurance claim amounts based on demographic and health features via an interactive Streamlit app.
  Outcome: Deployed an accurate app for real-time claim predictions supporting insurance decision-making.

- **Diabetes Prediction System** [Link]
  Objective: To predict whether a patient has diabetes based on features such as Glucose level, Insulin, Age, and BMI, leveraging machine learning algorithms.
  Outcome: Developed a Flask-based web application for real-time diabetes prediction, evaluated multiple models to determine the best-performing algorithm using the accuracy metric, and deployed the solution.

- **4D Light sheet zebrafish larvae cardiac nuclei segmentation** [Link]
  Objective: Assisted in the development of a parallel computation-assisted image reconstruction algorithm and 3D Unet model for nuclei segmentation.
  Outcome: Achieved 87% accuracy in nuclei segmentation, significantly enhancing the visualization and analysis of cardiac function. Boosted processing efficiency by over 10x, reducing image reconstruction time from 3 hours to 20 minutes, enabling high-throughput, memory-optimized analysis and comprehensive assessment of myocardial mechanics.

- **Hyper-spectral image segmentation of head and neck squamous cells for cancer in surgical specimens** [Link]
  Objective: To segment hyper-spectral images of head and neck squamous cell carcinoma to detect cancer margins accurate.
  Outcome: Developed a Wavelet CNN model on HPC cluster achieving an accuracy of 74% for segmenting cancer margins on unseen data of head and neck squamous cell carcinoma surgical specimens.

- **Covid CT Classification using vision transformers** [Link]
  Objective: To develop a CT image classification system for Covid-19 diagnosis leveraging vision transformers.
  Outcome: Achieved 92% accuracy in classifying CT images into Covid-positive and Covid-negative categories, demonstrating the model's efficacy for clinical application.

EDUCATION

The University of Texas at Dallas, Richardson, Texas Jan 2022 - Aug 2023
Master of Science, Biomedical Engineering (Thesis track) | Dean's Scholarship **GPA 3.8 / 4.0**
Relevant Courses: Physiology and Immunology for engineers, Artificial Intelligence in Biomedical Engineering, Advanced neuroscience, Medical Device Development (FDA regulations, HIPAA, etc).

D Y Patil University, Mumbai, India June 2012 - May 2016
Bachelor of Science, Biomedical Engineering (Thesis track) | Merit Scholarship **GPA 4.0 / 4.0**
Relevant Courses: Human Anatomy, Bioinformatics, Genetics, Electronics Circuit Analysis and Design I-II, Digital Image Processing, Digital Signal Processing, Medical Informatics (EHR's, Claims, Clinical trials, Public health, etc).