Abhishek Rajesh Saste

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SUMMARY:

An enthusiast with a Master's degree in Communications and Signal Processing and experience as a Machine-Learning Intern, I am proficient in Python, AI/ML frameworks (TensorFlow, PyTorch, Keras), machine learning algorithms, deep learning algorithms, computer vision algorithms, natural language processing algorithms, and signal processing algorithms. My excellent analytical and problem-solving skills, passion for learning new technologies, and staying up-to-date with industry trends make me a valuable addition to any team.

EDUCATION:

- **MSc. Communications and Signal Processing:** Newcastle University, Sep 2021 - Sep 2022.
  - **Subjects covered in the course:**
    Image Processing and Computer Vision, Intelligent Signal Processing, IoT and Wireless Sensors, Information Theory and Coding, Communications and Signal Processing, and Wired and Wireless Communication.
- **B.E in Electronics and Telecommunication**, Ram Rao Adik Institute of Technology, Navi Mumbai, Jun 2016 - Nov 2019.

EXPERIENCE:

- **Artificial Intelligence Researcher (Team Leader) - Rolladome Skates, June 2023 - Present**
  - Led a team of AI researchers in developing innovative solutions for the roller skating industry at Rolladome Skates.
  - Conducted in-depth research and analysis to identify opportunities for implementing artificial intelligence algorithms and models in various aspects of roller skating, such as performance analysis and personalized training recommendations.
  - Oversaw the design and implementation of AI systems, ensuring adherence to project timelines and quality standards.
  - Collaborated closely with cross-functional teams, including skating experts, data scientists, and software developers, to foster a collaborative environment and leverage diverse expertise.
  - Provided mentorship and guidance to team members, facilitating their professional growth and fostering a cohesive and high-performing team dynamic.
  - Played a crucial role in driving innovation and pushing the boundaries of AI applications in the roller skating industry.
  - Presented research findings, project progress, and recommendations to stakeholders, including senior management and executive teams.
  - Actively contributed to the strategic planning and decision-making process, aligning AI research efforts with company objectives and long-term vision.
  - Proactively identified opportunities for continuous improvement and optimization in AI research processes, tools, and methodologies.
  - Maintained up-to-date knowledge of industry trends, emerging technologies, and best practices in AI research, incorporating relevant insights into project strategies and execution.

- **iNeuron Pvt. Ltd, October 2022 – April 2023, Job Role**: Machine-learning Intern (Remote Certified Internship).

Project Approach: Using the available factors present in the dataset and performing classical machine learning tasks and developing end-to-end projects that involve the following tasks;
  - Utilizing the available factors in the dataset and performing classical machine learning tasks like data exploration, visualization, and manipulation.
  - Preprocessing and engineering features to create datasets for machine learning applications.
  - Employing Scikit-learn or Keras for model building and improving accuracies.
  - Utilizing Grid search cross-validation, assisting in evaluating AI models' performance, and suggesting improvements and optimizations.
  - Creating a UI using Python FLASK and deploying it on AWS, Azure, or Google Cloud platforms.
  - Contributing to developing AI-powered applications and tools by writing clean and efficient code.

CERTIFICATIONS AND ACHIEVEMENTS:

- **Cognizant Artificial Intelligence Virtual Experience Program – May 2023:**
  - Analyzed complex datasets utilizing Python to extract valuable insights and derive actionable recommendations.
  - Employed machine learning techniques to develop models for predictive analytics, achieving accurate and reliable results.
  - Effectively communicated machine learning findings through comprehensive reports and engaging presentations.
  - Implemented production-ready machine learning algorithms, ensuring scalability and efficiency in real-world applications.
  - Assessed algorithm performance through rigorous testing and validation, identifying areas for optimization and fine-tuning.
  - Collaborated with cross-functional teams on challenging projects, leveraging technical expertise and fostering effective teamwork.
  - Demonstrated a strong grasp of statistical concepts and machine learning algorithms, applying them to solve complex problems.
  - Actively contributed to discussions on data-driven decision-making and provided valuable insights based on thorough analysis.
  - Acquired practical experience in feature engineering, model evaluation, and hyperparameter optimization techniques.
  - Displayed a commitment to continuous learning, staying up-to-date with the latest advancements in machine learning and data science.

- **Virtual Experience Program in Data Science for British Airways – June 2023:**
  - Gained hands-on experience in web scraping, machine learning, data visualization, and predicting customer buying behavior. Additionally, acquired practical experience in feature engineering, model evaluation, and hyperparameter optimization techniques.
  - Leveraged natural language processing (NLP) techniques to extract and analyze customer review data, uncovering valuable insights on sentiment and preferences.

- Developed predictive models using machine learning algorithms to forecast future trends and make data-driven recommendations for optimizing customer satisfaction and loyalty.
- Emphasized the importance of effective data visualization techniques to communicate complex findings in a clear and compelling manner.
- Demonstrated a strong dedication to ongoing learning, actively keeping abreast of the latest developments and breakthroughs in the fields of machine learning and data science.

SKILLS:

- **Programming Languages, Databases, and Scripting Languages:** Python, C++, MySQL, HTML, CSS, JavaScript, and Big Data environment (Hadoop, Spark).
- **AI/ML Frameworks and Libraries**: Keras, TensorFlow, PyTorch, Pandas, Numpy, Scikit- learn Open CV and Linux.
- **Software:** Jupyter Notebook, GitHub, Docker, PyCharm, Excel, PowerPoint, Word, Outlook.
- **Data Analytics tools:** Tableau, Excel.
- **Cloud Platform:** AWS EC2 instance, AWS SageMaker, Microsoft Azure Machine Learning, Google Cloud AI Platform.
- **Mathematics**: A good understanding of Linear Algebra, Calculus, Probability, and Statistics and the foundational mathematical concepts that are used in Machine learning and Deep learning algorithms.
- **Machine Learning Algorithms**: Linear Regression, Logistic Regression, Decision Trees, Random Forest, Support Vector Machines, Naive Bayes, K-Nearest Neighbours, Neural Networks, Gradient Boosting, Clustering, AutoML, and Transfer Learning.
- **Deep Learning Algorithms:** Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Reinforcement Learning.
- **Computer Vision Algorithms:** Object Detection, Image Segmentation, Face Recognition, Image Classification, and Object Tracking.
- **Natural Language Processing Algorithms:** Text Classification, Sentiment Analysis.
- **Personal skills:** Strong analytical and problem-solving skills, quick learner, Passion for learning new technologies and staying up-to-date with industry trends, delivery-driven mindset, strong communication, and interpersonal skills, Efficient and Dedicated to work, the ability to work under pressure and multi-task, and strong organizational skills.

PROJECTS:

- **MSc Project and the challenges undertaken:** Tuberculosis, Pneumonia, and Healthy and Infected lung detection using Convolutional Neural Networks: VGG16, VGG19, and ResNet50.
  1. Pneumonia detection using VGG16, VGG19, and ResNet-50 using Transfer Learning.
  2. Tuberculosis detection using VGG16, VGG19, and ResNet-50 without using transfer learning.
  3. Classifying Healthy, Pneumonia, or Tuberculosis X-Ray from the best model.
  4. Executing predictions on individual models for their designated functions
  5. To analyze the variability in the training and testing accuracies of all the mentioned models on different train-test split ratios trained on different numbers of epochs.

  Skills and Tools used:
  Data Visualization, Data Preparation, Model building and Evaluation, Open CV, Python, Numpy, Pandas, Tensorflow, Scikit-learn.

- **Personal Projects and Kaggle Problems:**

  ❖ **Sentiment Analysis model using NLP.**
  - Developed a sentiment analysis model for stocks with news headlines using NLP techniques.
  - Analyzed the relationship between world news headlines and stock price shifts using a dataset containing 25 columns of top news headlines for each day, spanning from 2008 to 2016.
  - Preprocessed the data by removing punctuations and converting all text to lowercase to ensure consistency.
  - Used a CountVectorizer to extract features from the text by converting the text into a matrix of token counts.
  - Trained a RandomForestClassifier machine learning model on the training dataset and achieved an accuracy score of 84.12% over the test data.
  - Demonstrated that there is a relationship between news headlines and stock price shifts, which has practical implications for investors and financial analysts.

  ❖ **Customer Segmentation.**
  - Assisted an automobile company in entering new markets and identifying the right group of new customers based on their behavior using clustering techniques.
  - Prepared the data for clustering and gained insights through data visualization.
  - Employed three methods to determine the optimal value for k: the number of clusters, including silhouette, WCSS, and Calinski-Harabasz methods.
  - Identified clusters of similar observations that can enable the automobile company to perform segmented outreach and communication for different segments of customers, tailoring marketing strategies and communication to specific customer segments.

  ❖ **Fraud Detection Model.**
  - Detected credit card fraud using anomaly detection techniques.
  - Analyzed credit card transaction data from September 2013, comprising 284,807 transactions.
  - Highly imbalanced dataset with only 492 fraudulent transactions.
  - Transformed numerical input features using PCA, labeled as V1, V2... V28.
  - Used three different anomaly detection techniques: Isolation Forest, Local Outlier Factor (LOF), and Support Vector Machines (SVM).
  - Achieved an accuracy rate of 99.74%, which is higher than the LOF accuracy rate of 99.65% and much higher than the SVM accuracy rate of 70.09%.
  - Results suggest that increasing the sample size or using deep learning algorithms could improve accuracy further, but at the cost of increased computational expense.