Arundhati Surendra Shanbhag

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I am a passionate AI enthusiast with a background in Machine Learning, Computer Vision, and Generative AI, driven by the goal of **using technology to make the world a better place**. I enjoy solving real-world problems, from enhancing medical diagnostics to optimizing e-commerce systems, by leveraging cutting-edge AI solutions. I am committed to continuous learning, innovation, and applying AI to create meaningful, positive change.

PROFESSIONAL EXPERIENCE

Student Research Assistant   04/2023 – Current

Deutsches Forschungszentrum Für Künstliche Intelligenz, DFKI, Kaiserslautern, Germany

Diffusion Models for Image Restoration

- Conducted in-depth research and implemented **Diffusion Models for Super Resolution (SR),** gaining a comprehensive understanding of the underlying principles and applications of diffusion models.
- This work enhanced my expertise in **generative AI** techniques and their practical use in improving image quality and resolution.

Hierarchical Diffusion Classifiers

- Developed a **hierarchy-based zero-shot classifier** leveraging Stable Diffusion.
- Optimized the model to **achieve a 60% speed-up** and significantly **enhanced per-class top-1% accuracy**, demonstrating both efficiency and precision improvements.
- Through this work, I gained proficiency in combining state-of-the-art generative AI models with innovative classification techniques to address real-world challenges in computational efficiency and accuracy.

Student Research Assistant   02/2022 – 07/2022

Deutsches Forschungszentrum Für Künstliche Intelligenz, DFKI, Kaiserslautern, Germany

Data Science for Social Good

- Authored comprehensive technical documentation for a wide range of Machine Learning algorithms.
- This experience enhanced my understanding of complex models, especially in the domain of medical AI and strengthened my ability to apply AI methodologies to real-world medical problems, reinforcing my commitment to leveraging technology for impactful and life-saving applications.

Junior Data Scientist   07/2019 –07/2021

AIenterprise Software India Pvt. Ltd., Bangalore, India

Recommendation Engines for E-Commerce

- Developed a recommendation system to provide product-based recommendations to e-commerce clients using various **algorithms for upselling and cross-selling** in Python and Scala.
- Engineered modules for query expansion in e-commerce search systems using NLP.
- Achieved measurable business impact, **contributing up to a 5% increase in sales** directly attributed to the optimized recommendation engine.
- This work highlights my ability to apply ML to solve real-world business challenges, improve user engagement, and drive revenue growth.

Automated Machine Learning System

- Developed a system that **automates the Machine Learning workflow** in Python and Pyspark**,** streamlining model development, training, and evaluation processes.
- Integrated MLFlow to systematically track experiments, compare performance metrics, and identify the best-performing models. The project demonstrates my expertise in **building scalable ML workflows**, leveraging tools to enhance productivity, and delivering data-driven solutions efficiently.

Visitor Traffic Prediction

- Developed a system to forecast visitor traffic for retail, enabling optimized labor allocation.
- Conducted extensive data analysis to uncover patterns, trends, and key features influencing visitor traffic.
- Built an XGBoost model to deliver accurate predictions, enhancing labor optimization.

EDUCATION

Master of Science in Computer Science   10/2021 – Current

Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau (RPTU)

Specializations: Intelligent Systems and Data Visualization

- **Grade – 1.5**
- **Subjects:** 2D Image Processing, Deep Learning, 3D Computer Vision, NLP, Machine Learning.

Thesis: Leveraging Multimodal Environmental Cues for Human-Robot Interaction

- Developed an audio-visual module for the humanoid Ameca Robot EMAH using C++ and Python.
- Successfully **implemented and integrated sound classification, object and scene-text detection, and human activity recognition** to enable the robot to perceive and respond to multimodal environmental cues effectively.
- This work highlights my expertise in combining computer vision, audio processing, and robotics to advance human-robot interaction.

Bachelor of Engineering in Computer Science and Engineering   08/2015 – 06/2019

BMS Institute of Technology, Bangalore, India (Affiliated to Visvesvaraya Technological University, Karnataka)

- **Grade ─ 1.8**

Thesis: Intelligent Accident Prevention in VANETs   10/2018 – 05/2019

- Implemented a prototype of intelligent detection of accidents on roads using a K-nearest neighbors model in a Vehicular Ad-hoc Network (VANET) system.

SKILLS

Programming Languages: Python, C++, Pyspark and Scala.

Big Data and Databases: Spark, SQL, Postgres**.**

Data Science Frameworks: Pytorch**,** Pandas, Numpy, Scikit-Learn, HuggingFace, Diffusers, OpenCV,

NLTK, Keras, Spacy, Matplotlib, Bokeh, MLFlow.

Digital Skills: MS Office, Git.

HONOURS AND AWARDS

- Recipient of the **Deutschlandstipendium** in October 2022.
- **Spot Award**, January 2020 for work on a recommendation engine at AIEnterprise Software India Pvt. Ltd.

LANGUAGES

English (Native Speaker), German (Limited Working Proficiency), Hindi, Konkani and Kannada.

INTERESTS

Reading fictional novels, Cooking recipes from around the world, Crocheting, and Indoor Gardening.

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Arundhati Shanbhag