

# Harsh Sanjay Rath

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## PORTFOLIO

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## PROFILE

Dedicated in AI with a solid background in machine learning, data analysis, and model optimization. Experienced in designing and implementing intelligent algorithms that solve complex problems across various domains. Passionate about leveraging AI to drive innovation and improve decision-making processes, with a strong commitment to ethical AI development.

## EDUCATION & QUALIFICATIONS

University Of Adelaide - Master`s degree Artificial Intelligence 2025

Currently pursuing a Master of Artificial Intelligence at the University of Adelaide, with a focus on advanced machine learning, deep learning, and data-driven AI methodologies. Engaged in cutting-edge research and practical projects that explore the ethical and innovative applications of AI across various industries. Committed to gaining expertise in developing intelligent systems that solve real-world challenges and contribute to the future of AI technology.

Babasaheb Ambedkar Technical University - Bachelor`s degree Instrumentation 2022

Completed a Bachelor's degree in Instrumentation Engineering from Babasaheb Ambedkar Technological University, with a strong foundation in automation, control systems, and sensor technology. Developed practical skills in designing and implementing instrumentation systems for various industrial applications. This academic experience has provided a solid technical background, paving the way for advanced studies and a career in Artificial Intelligence

Sanjay Ghodawat Polytechnic - Diploma Mechanical Engineering 2019

Earned a Diploma in Mechanical Engineering from Sanjay Ghodawat Polytechnic, where I gained hands-on experience in mechanical systems, manufacturing processes, and engineering design. This diploma provided a solid technical foundation, equipping me with practical skills in problem-solving and project management, which have been instrumental in my subsequent studies and specialization in Artificial Intelligence.

## RESEARCH PROJECT AT UNIVERSITY OF ADELAIDE

The subject of my current research at the University of Adelaide involves developing an innovative initiative for Osteoarthritis (OA) Detection using Computer Vision. The research work tests Vision Transformers (ViT's) for analyzing joint MRI scans to detect and categorize early stages of OA. The research project demonstrates perfectly how the healthcare sector can be transformed by using Deep Learning and Machine Learning technologies under my role as an AI researcher.

## AI/ML Courses & Certifications

Enrolled in a course "Complete Guide to Building, Deploying, and Optimizing Generative AI with LangChain and Hugging Face", by completing this course I will gain practical understanding of open-source LLMs (including LLaMA, Falcon and Mistral) and API integration for GPT-4 alongside skills to use LangChain for prompt chaining and Hugging Face Transformers for model deployment and best practices for deploying AI applications in the real world

## PROJECTS:

Species Classification: VGG16 vs REsNet152: Researched into Convolutional Neural Network with 100 different types of bird classification with two comparative models VGG16 and REsNet152. Architecture of REsNet152 is more complex and efficient in terms of performance.

Sentimental analysis Architecture: dived into NLP (Natural Language Processing) with a profound understanding on sentimental analysis and a full architecture to divide contextual text in positive and negative sentiments.

Question Answer (QA) System: Deeper in NLP, with a curiosity of how Chat GPT works, I studied a Question Answer Based System Which Solves User queries with an input set of articles. Learned how TfidfVectorizer converts words to numbers, and how cosine similarity calculates the similarity score of question to the answer.

Stock price prediction Using LSTM: Tried to predict Nifty50 stock prices using various models and hyperparameters. Where I found out that LSTM (Long Short - Term Memory) with four layers and hyperparameter optimization gave the highest R Square value which was 0.89

Breast Cancer detection: In the series of classification tasks, I learned how to fine tune the predictive models with gridsearch and apply decision boundaries. Various models were compared to each other, and the best model was fine-tuned more for higher accuracy. Ended up having 0.93 R Square.

Recommendation System: Developed a personalized recommendation system using collaborative filtering (user-based and item-based) with cosine similarity and Pearson correlation. Applied Singular Value Decomposition (SVD) for dimensionality reduction. Evaluated performance with precision, recall, and F1-score to ensure recommendation accuracy.

## ADDITIONAL INFORMATION

Languages – English, Hindi, Marathi, Gujrati,

Technical skills

Languages: Python, Java (Basics), HTML.

Scientific Tools: TensorFlow, Keras, Sklearn, Pandas, NumPy, NLTK (NLP Library) Developer Tools: GIT, VS Code, Google Colab, Terminal, Hugging Face Transformers, LangChain, OpenAI API, spaCy, , TextBlob, Haystack, SentenceTransformers, FastAPI, Gradio, Streamlit.

## INTERESTS

Soccer: Enjoy playing in local leagues and staying active with team sports.

Badminton: Regularly participate in badminton matches, honing reflexes and strategic thinking.

Swimming: Passionate about swimming for both fitness and relaxation.

yoga: Committed to maintaining physical and mental fitness through regular yoga practices.

Cricket: Enthusiastic about playing and following cricket, appreciating the strategy and teamwork involved.