ABDUL MANAF

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SUMMARY

MS Computer Science student and Research Fellow at NTNU, Norway, specializing in AI solutions for medical imaging, disaster management, and education. Published researcher in IEEE Access and Biomedical Signal Processing with expertise in computer vision, YOLO models, and multimodal AI frameworks. Currently leading HEC-funded disaster management projects while developing intelligent agents for healthcare and education sectors. Proficient in Python, TensorFlow, PyTorch, and cloud technologies with proven ability to deliver end-to-end AI solutions from research to deployment.

RESEARCH EXPERIENCE

NTNU, Gjøvik: Research Fellow Jan 2025 - May 2025

- Research Fellow at Norwegian University of Science and Technology (NTNU), Norway, through the fully-funded NORPART-CONNECT Project. Conducting advanced research in AI, Machine Learning, Deep Learning, and LLMs with applications in education, medical imaging, and environmental solutions. Collaborating with international researchers to develop AI-powered educational tools and drive innovation in technology-education integration.

Sukkur IBA University, Sukkur: Research Associate (Computer Vision) Nov 2023 – Present

- Engaged in a project funded by Sindh HEC, our objective is to create an AI-driven system that interfaces with UAV devices for flood disaster rescue operations. This endeavor primarily focuses on image processing, utilizing techniques such as classification, segmentation, and question answering.

Deep-NLP Research Group - (Remote) Nov 2022 – Dec 2023

Diverse research group specializing in NLP through deep neural networks, producing high-quality research, writing successful funding proposals, supervising students, and applying expertise to real-world problems.

- Collaborated on NLP research, focusing on deep neural networks, and aligned my Final Year Project (FYP) with the objectives of the Deep-NLP research group. (http://deep-nlp.net/)

EXPERIENCE

FASTECH SYSTEMS LIMITED, Software House: Machine Learning Engineer Jun 2023 – Nov 2023

- During my six months with the company, I have contributed to multiple innovative AI initiatives, including an AI-powered book creation platform, an intelligent hotel menu recommendation system, and a real-time audio call sentiment analysis tool. Through these projects, I've applied machine learning algorithms, data processing techniques, and AI frameworks to address practical business challenges while delivering measurable improvements to both user experience and operational efficiency.

CodeClause, Software company in Pune, India: Data Scientist Intern Mar 2023 – May 2023

- Developed machine learning models for stock market prediction and wine quality prediction, using data analysis and statistical modeling techniques to forecast market trends and provide insights for quality control and optimization in the wine industry.

EDUCATION

MSCS, Computer Science Graduated on Dec 2025

Sukkur IBA University, Sukkur, Pakistan

Relevant coursework: Advance Machine Learning, Advance Natural Language Processing, Research Methodology, Theory of Programming, Computer Vision

BSCS, Computer Science Graduated on June 2023

Sukkur IBA University, Sukkur, Pakistan 3.08 CGPA

Relevant coursework: Object Oriented Programming, Data Structures, Design and Analysis of Algorithms, Artificial Intelligence, Image Processing, Machine Learning, Probability and Statistics

TECHNICAL SKILLS

Programming Languages: Python, Java, Javascript, C, C++, C#
Front-end Technologies: HTML, CSS, Bootstrap, Tailwind CSS, jQuery, React
Back-end Technologies: Node.js, Express.js, Flask, Django
Databases: MySQL, MongoDB, SQLite
Machine Learning and AI Libraries/Frameworks: Numpy, Pandas, PyTorch, scikit-learn, TensorFlow, Matplotlib, Keras, OpenCV, Generative Adversarial Networks (GANs), GPT-3, Stable Diffusion, DALL·E
Others: Git, GitHub, AWS, Docker, Kubernetes, Generative AI, NLP, Computer Vision

PUBLICATIONS

A. Ahmed, Ali Shariq Imran, A. Manaf, Z. Kastrati, and Sher Muhammad Daudpota, "Enhancing wrist abnormality detection with YOLO: Analysis of state-of-the-art single-stage detection models," Biomedical Signal Processing and Control, vol. 93, pp. 106144–106144, Jul. 2024, doi: https://doi.org/10.1016/j.bspc.2024.106144**.**

A. Ahmed, and A. Manaf, "Pediatric Wrist Fracture Detection in X-rays via YOLOv10 Algorithm and Dual Label Assignment System," arXiv.org, 2024, https://arxiv.org/abs/2407.15689 **(accessed Jul. 08, 2025).**

A. Manaf, N. Mughal, Kazim Raza Talpur, Bandeh Ali Talpur, G. Mujtaba, and Samar Raza Talpur, "Aerial Image Classification in Post Flood Scenarios Using Robust Deep Learning and Explainable Artificial Intelligence," IEEE Access, pp. 1–1, Jan. 2025, doi: https://doi.org/10.1109/access.2025.3543078**.**

A. Ahmed, A. Manaf, A. S. Imran, Z. Kastrati, and S. M. Daudpota, "Small Data, Big Impact: A Multi-Locale Bone Fracture Detection on an Extremely Limited Dataset Via Crack-Informed YOLOv9 Variants," 2024 International Conference on Frontiers of Information Technology (FIT), pp. 1–6, Dec. 2024, doi: https://doi.org/10.1109/fit63703.2024.10838409**.**

ACADEMIC PROJECTS

Student AI Navigator - Intelligent RAG-based Educational Chatbot 2025
Developed an intelligent RAG-based educational chatbot using advanced AI technologies, providing personalized learning assistance and real-time educational support to students across various subjects *(https://student-ai-navigator.vercel.app/)*.

- Implemented retrieval-augmented generation (RAG) system using LangChain and OpenAI GPT models to provide contextual responses based on educational content.
- Designed and deployed a user-friendly web interface using modern web technologies, enabling seamless interaction between students and AI-powered educational assistant.
- Integrated document processing capabilities to handle various educational materials and create a comprehensive knowledge base for enhanced learning support.

LinkedInCraft - AI-Powered LinkedIn Post Generator 2024
Created an innovative AI-powered platform that generates engaging LinkedIn posts using advanced natural language processing, helping professionals enhance their social media presence and networking capabilities *(https://manafai.pythonanyw*

- Developed intelligent content generation system using OpenAI GPT models to create personalized and engaging LinkedIn posts based on user preferences and industry trends.
- Implemented responsive web interface with modern UI/UX design principles, ensuring seamless user experience across different devices and platforms.
- Integrated advanced prompt engineering techniques to optimize content quality and relevance, resulting in highly engaging professional social media content.

AI Finance Agent Team - Multi-Agent Financial Intelligence 2024
Architected a sophisticated multi-agent system for financial analysis and intelligence, leveraging collaborative AI agents to provide comprehensive financial insights and investment recommendations *(https://manafai.pythonanywhere.com/finance*$_{ag}$*e*

Designed and implemented multi-agent architecture using advanced AI frameworks to enable collaborative financial analysis and decision-making processes.
Integrated real-time financial data processing capabilities to provide up-to-date market analysis and investment insights for informed decision-making.
Developed sophisticated communication protocols between AI agents to ensure coordinated analysis and comprehensive financial intelligence reporting.

AI Research Agent - Professional Research Reports Powered by GPT-4 2024
Built an autonomous research agent system powered by GPT-4 that automatically generates comprehensive research reports, significantly reducing research time while maintaining high academic standards.*(https://manafai.pythonanywhere.com/r*

Developed automated research pipeline using GPT-4 and advanced web scraping techniques to gather, analyze, and synthesize information from multiple sources.
Implemented sophisticated report generation algorithms that structure findings into professional academic format with proper citations and references.
Created intelligent quality assurance mechanisms to ensure research accuracy and credibility, maintaining high standards for generated reports.

Book Generation with GPT-3.5 Turbo 2023
Developed an innovative AI-powered book generation system using GPT-3.5 Turbo, enabling automated creation of structured, coherent, and contextually relevant books across various genres and topics.

- Engineered sophisticated prompt engineering techniques to generate consistent narrative flow and maintain coherent storytelling throughout entire book structures.
- Implemented advanced content organization algorithms to structure chapters, sections, and subsections with logical progression and thematic consistency.
- Created quality control mechanisms to ensure generated content meets publishing standards while maintaining creative authenticity and reader engagement.

Recipe Management System 2023
Built a comprehensive full-stack recipe management application using modern web technologies, providing users with intuitive recipe storage, search, and meal planning capabilities.

- Developed responsive frontend interface using React.js with modern UI/UX design principles, ensuring seamless user experience across different devices.
- Implemented robust backend system with Node.js and MongoDB for efficient recipe storage, retrieval, and management with advanced search and filtering capabilities.
- Integrated user authentication and authorization systems to provide personalized recipe collections and secure data management.

BookStore MERN Project 2023
Architected and developed a full-featured online bookstore application using the MERN stack (MongoDB, Express.js, React.js, Node.js), providing comprehensive e-commerce functionality for book sales and management.

- Implemented complete e-commerce functionality including product catalog, shopping cart, payment processing, and order management systems.
- Designed scalable database architecture using MongoDB for efficient book inventory management and user data storage.
- Developed secure authentication and authorization systems with role-based access control for customers and administrators.

DQA Chatbot 2022
Developed an intelligent domain-specific question-answering chatbot using natural language processing techniques, providing accurate and contextual responses to user queries within specialized knowledge domains.

- Implemented advanced NLP algorithms for intent recognition, entity extraction, and response generation using machine learning models.
- Created comprehensive knowledge base with efficient retrieval mechanisms to provide accurate and relevant answers to domain-specific questions.

- Designed conversational interface with natural language understanding capabilities, ensuring smooth and intuitive user interactions.

Pediatric Wrist Anomaly Detection Fall 2022 – Spring 2023

Partnered closely with a teammate to successfully create an automated system utilizing YOLO object detection methods, enabling precise and accurate pediatric wrist abnormality detection with an impressive fracture detection mean average precision (mAP) of 0.95.

- Collaboratively conducted in-depth research, refining methodologies to ensure quality and academic standards of pediatric wrist abnormality detection research paper.
- Demonstrated a strong commitment to academic excellence through dedicated efforts in conducting literature reviews, analyzing findings, and refining the research methodology, resulting in the successful completion of a comprehensive research paper on the detection of wrist abnormalities.
- Leveraged expert guidance and feedback from supervisors to enhance the rigor and validity of the research, showcasing a proactive approach to academic growth and a passion for advancing knowledge in the field of pediatric wrist abnormality detection.

Image Captioning System To Assist The Blind Fall 2022

The project is aimed at developing a system using deep learning techniques to assist visually impaired individuals in obtaining information by describing images taken by them.

- Incorporated state-of-the-art pre-trained models, such as ResNet50, VGG16, and VGG19, for image feature extraction and LSTM and Bidirectional LSTM for text generation. Evaluated various models to determine the best-performing model with a BLEU-score of 0.61 and deployed it using Flask and pyttsx3 for web and text-to-speech functionality in the app.
- Deployed over the web with a user-friendly interface by utilizing the flask framework.

Pediatric Chest Pneumonia Classification: Leveraging Traditional CNN with GAN for Data Balancing Fall 2022

Pediatric Chest X-ray detection using DL techniques for accurate pneumonia identification.

- Explored and implemented Generative Adversarial Networks (GANs) to generate synthetic data for training models, enhancing the dataset and improving the performance of the system.
- Developed a user-friendly interface for seamless interaction and intuitive pneumonia classification.

Tweets Sentiment Analysis Fall 2022

The primary objective is to train and evaluate different models for sentiment analysis on the dataset.

- For each of the 16 experiments, the trained models are evaluated on the test dataset.
- The evaluation metrics include accuracy, precision, recall, and F1 score. The results are reported below in a tabular format.

Stock Market Prediction Spring 2023

The project utilizes the Tesla Stock Price dataset for training and evaluating the machine learning model. By utilizing this dataset, the machine learning model learns from the historical price patterns of Tesla's stock and predicts whether the closing price will increase by 15% within 20 market days.

Patient History App (Kotlin) Spring 2022

The aim of this project is to develop an android application for dispensary patient data management and viewing, which will enable doctors to enter and view patient history and details. The application will be a standalone system that can be installed on an Android phone, and used after a successful login.

Recipe Management Application (MERN Project) Fall 2023

The aim of this project is to create a React-based application that streamlines recipe management by simplifying the process of searching for and adding ingredients and instructions, making culinary exploration a hassle-free experience.

Travel and Tour Agency Website (HTML, CSS, & Javascript) Fall 2021

This travel and tour agency website aims to provide an elegant online platform for travelers to explore destinations like HTML, CSS, Bootstrap, and JavaScript. Whether you're a novice or a seasoned developer, our website is designed to guide you through a captivating journey of web development.

CERTIFICATIONS

Introduction to Generative AI Learning Path (Google Cloud) by Coursera	April 2025
Responsible AI: Applying AI Principles with Google Cloud (Google Cloud) by Coursera	April 2025
Introduction to Responsible AI (Google Cloud) by Coursera	April 2025
Introduction to Large Language Models (Google Cloud) by Coursera	April 2025
Introduction to Generative AI (Google Cloud) by Coursera	April 2025
Introduction to Retrieval Augmented Generation (RAG) (Duke University) by Coursera	March 2025
Sequence Models (DeepLearning.AI) by Coursera	March 2025
Convolutional Neural Networks (DeepLearning.AI) by Coursera	February 2024
Structuring Machine Learning Projects (DeepLearning.AI) by Coursera	February 2024
Improving Deep Neural Networks: Hyperparameter Tuning	February 2024
Neural Networks and Deep Learning (DeepLearning.AI) by Coursera	March 2023
Build a Firebase Android Application by Coursera	February 2023
What is Data Science? (IBM) by Coursera	February 2023
Kotlin Fundamentals by Sololearn	September 2022
MATLAB Onramp by MathWorks	March 2022
Introduction to Relational Databases in SQL by DataCamp	April 2021
Introduction to SQL by DataCamp	April 2021
Data Structures and Performance (UC San Diego) by Coursera	November 2020
Java Programming: Solving Problems with Software (Duke University) by Coursera	August 2020
Programming for Everybody (Getting Started with Python) (University of Michigan) by Coursera	July 2020
Introduction to HTML5 (University of Michigan) by Coursera	July 2020
Mathematical Thinking in Computer Science (UC San Diego) by Coursera	July 2020