MUHAMMAD WASEEM
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Education

P.hD Computer Science (Thesis in Progress{Generative AI, LLM, Diffusion Model}) *Lahore, Department of Computer Science*

University of Engineering Technology,

Lahore .

Thesis: A Frame for Generating Human-Focus Video from Text Description

M.S Computer Science *Lahore, Pakistan*

Virtual University of Pakistan,

Lahore 3.57/4.0 CGPA

Thesis: Deep Learning Syntactic Enrichment and Affinity Resemblance for Biomedical Images to Access Publications(https://vspace.vu.edu.pk/detail.aspx?id=586)

B.S Information Technology *Sargodha, Pakistan*

UNiVERSiTY OF SARGODHA

3.70/4.0 CGPA –*Sep, 2009*

Experience

Al-Khwarizmi Institute of Computer Science (KICS) UET, *Lahore, Pakistan*
Intelligent Criminology Research Lab (ICRL)*Nov 2022 - till now*

- Educational Background: Bachelor's/Master's degree in Computer Science with a robust academic foundation in machine learning, artificial intelligence, and their applications across multiple domains.
- Expertise in LLMs and Advanced Techniques: 2 years of hands-on experience working with Large Language Models (LLMs), including Retrieval-Augmented Generation (RAG), Agentic RAG, and Multimodal AI. Successfully implemented state-of-the-art techniques for LLM optimization in production systems.
- Python Proficiency: Proficient in Python, with a proven track record of developing and maintaining production-grade backend systems for AI/ML pipelines, ensuring scalability and performance.
- Applications Across Diverse Domains: Leveraged AI expertise to drive innovations in health, sustainability, finance, social sciences, and teaching, delivering impactful solutions tailored to specific industry needs.
- Language Processing and Learning Enthusiast: Passionate about advancing natural language understanding and generation technologies, with a keen interest in exploring new methodologies and expanding technical competencies.
- MLOps/DevOps: Practical experience in MLOps and DevOps workflows, enabling seamless integration, deployment, and monitoring of AI models in real-world applications.
- Collaborative and Innovative: Adept at working with cross-functional teams to deliver AI-driven solutions that address complex challenges and create value for organizations.
- Worked on fire detection projects using YOLOv8 algorithm
- Develop application that generate images from urdu text
- Worked on Machine Learning Model

Higher Education department, Punjab ,lahore *Lahore, Pakistan*
COPMUTER SCiENCE LECTURER *May 2012 - 2020*

- Collaborate with colleagues to address teaching and research issues
- Serve on academic or administrative committees that deal with institutional policies, departmental matters, and academic issues.
- Act as advisers to student organizations.
- Supervise undergraduate teaching, internship, and Project work.
- Perform administrative duties such as serving as department head. Consoling the student for their future

- Evaluate and grade students' class work, laboratory work, assignments, and papers. Maintain student attendance records, grades, and other required record

NADRA (National Database and Registration Authority), Pakistan System Engineer *jan 2011 - may 20212*

- Main Responsibilities are to perform the System Administrator Tasks. Responsibilities are listed below:
- Data base administration
- Network troubleshooting
- Public dealing
- Office Incharge
- Verification of applicant for Pakistani citizenship
- Coordination with headquarter
- Installation of software
- Working with Linux server
- Supervision center sub ordinates

University of Sargodha (UOS),Punjab, Pakistan Sargodha, *Pakistan* Research scholar *Sep 2009 - Jan 2011*

Project:

1. **AI-Assisted Policy/Procedure Data Extraction for Nursing Management**

   - Developed AI systems to extract relevant policy and procedure data, aiding in the management of clinical nursing scenarios and improving decision-making.

2. **AI-Assisted Voice/Audio Documentation and Charting for Registered Nurses (RN)**

   - Implemented an AI-based tool that assists RNs in voice-enabled documentation and charting, streamlining clinical workflows and reducing administrative burden.

3. **AI to Mitigate Psychiatric Specialist Shortages**

   - Designed an AI-driven solution to address the shortage of psychiatric specialists by automating parts of the diagnosis and care process, providing support to mental health practitioners.

4. **AI-Assisted Documentation for Home Health and Hospice Nurses**

   - Created an AI solution to assist nurses working in home health and hospice care by automating documentation tasks, allowing more time for patient care.

5. **Executive Brief: AI-Assisted Medication Prior Authorization Completion**

   - Developed AI tools to expedite the medication prior authorization process, streamlining communications between healthcare providers, insurers, and pharmacies.

6. **Driving Change: Using AI to Optimize Nurse-Led Quality Improvement Projects**

   - Utilized AI to analyze and optimize data for nurse-led quality improvement projects, driving better outcomes in clinical care and operational efficiency.

7. **I-Assisted Patient Information Extraction for Health Screening Alerts and Assessments**

- Developed AI models that extract and assess patient information, providing timely alerts for health screenings and preventive care assessments.

8. **Hospital to Home BP Pal**

- Built an AI-powered solution to assist patients transitioning from hospital to home, focusing on blood pressure monitoring and remote healthcare management to prevent readmissions.

9. **Detection of TB from X-Ray medical images**

DEVELOPMENT

- Utilized a pre-trained VIT model to generate synthetic visual data for X-Ray images segmentation and classification.
- Used Python and PyTorch for fine-tuning ViT models for generating realistic synthetic data.

10. **Intelligently Detection of Tiny cigarette butts detection from wastage**

DEVELOPMENT

- Data Collection
- Pre-processing the data • Data labeling
- Utilized a pre-trained DETR model to generate synthetic visual data for Cigarette butts images detection from videos.

11. **Fire detection from video**

DEVELOPMENT

- Data Collection
- Pre-processing the data
- Utilized a pre-trained YoloV8 model to generate synthetic visual data for fire images detection from videos.

12. **Urdu Navigation SYStem for visual impaired persons**

DEVELOPMENT

- Data Collection
- Pre-processing the data
- Utilized a pre-trained YoloV8 model to generate synthetic visual data for fire images detection from videos

13. **Generation of Imags from Urdu Text**

DEVELOPMENT

- Data Collection
- Pre-processing the data
- Utilized a pre-trained stable Diffuser Model model to generate synthetic visual data from urdu text.

14. **Detection of TB from X-Ray medical images**

DEVELOPMENT

• Utilized a pre-trained VIT model to generate synthetic visual data for X-Ray images segmentation and classification.

Used Python and PyTorch for fine-tuning ViT models for generating realistic synthetic data

15. **Empathy Chabot epilepsy patients**
16. **Multi-modal Chabot for Alzheimer dieses**
17. **Alzheimer Assistant: A Dual-Module AI System for Diagnosis and Knowledge Retrieval**
    - An AI system combining MRI-based Alzheimer stage prediction with a LAB-RAG-powered medical chatbot for intelligent support.
    - Achieves 98% accuracy and real-time responses via a user-friendly Streamlit interface for early screening and patient

Publications

a. **Muhahammad Waseem**, Abdul jaleel, Syed Khaldoon khurshid, Qasim Ali Ranjha, Muhammad Awais Hassan
. *" An Analytical Study on Covid-19 Disease Analysis with Modern Machine Learning Methods." (International Journal of Computational Intelligence in Control)*

b. Zabeehullah,Fahim Arif,Yawar Abbas,Shahbaz Ahmad, Muhammad Waseem
"*DLICA: Deep Learning based novel Strategy for Intelligent Channel Adaption in Wireless SDN-IoT Environment" (2023 International Conference on Communication, Computing and Digital Systems (C-CODE))*

c. A Holistic Approach for Detecting Socialbots on Twitter: Integration of Diverse Features (The Nucleus)

d. Machine Learning Techniques for Urdu Audio Feedback for Visual Assistance: A Systematic Literature Review(The Nucleus)

e. Habib, Shaheer, Mubashir Ahmad, Yasin Ul Haq, Rabia Sana, Asia Muneer, Muhammad Waseem, Muhammad Salman Pathan, and Soumyabrata Dev. "Advancing Taxonomic Classification through Deep Learning: A Robust Artificial Intelligence Framework for Species Identification Using Natural Images." *IEEE Access* (2024).

f. LCGD: Enhancing Text-to-Video Generation via Contextual LLM Guidance and U-Net Denoising . M Waseem, MUG Khan, SK Khurshid (IEEE Access).

g. IMETA-GNN: Meta Learning based Cold Start Optimization for Recommendation System, N Siddique, A Zafar, BA Akram, M Waseem, S Iqbal, A Al-Yahya.(IEEE Access)

h. Detection of Caries and Hypodontia Using Deep Learning and Explainable AI, M Kamran, M Waseem,N Shafi, A Zahid, 2024 18th International Conference on Open source System and Technologies.

Subject Taught

- **Programming Languages**: Python, C, C++,VB,JAVA,C#, Dart
- **Research Methodology**
- **Artificial Intelligence**
- **Machine Learning**
- **Digital Logic Design**
- **Operating System**
- **Database System**
- **Design and Analysis of Algorithm**
- **Analysis of Algorithms**
- **Data Structure**
- **Object Oriented Programming**
- **Data Ware housing**
- **Data Structure and Analysis**
- **Analysis of Algorithm**
- **Introduction to Computer Science**
- **Advance Research Methodology**

Technical Skills

- **Programming Languages**: Python, C, C++,VB,JAVA,C#,
- **Deep Learning Frameworks**: Keras, TensorFlow, OpenCV
- **Machine Learning Libraries**: Numpy, Pandas, Sklearn, Matplotlib
- **IDEs**: VS Code, Sublime, PyCharm, Jupyter- Notebook, Google Colab

• **Web Engineering**: Wordpress, HTML, CSS, Bootstrap, Flask, Django • **Generative AI** : LLM

• **Management Skills**: Leadership, Event Management, Scientific Writing, Public Speaking

Workshop

- **Cybersecurity Workshop** *ICCOST 2023*
  Gained advanced insights into cybersecurity trends, threat analysis, and mitigation strategies.
- **International Conferences**
  Presented papers and shared research findings in machine learning and cybersecurity domains.
- **Cybersecurity Workshop**
  ICCOST 2024

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