

SIDRA SALEEM

Software Engineer(Nextjs | Python | Mongodb | Typescript)
Research Assistant / Generative AI and Quantum Enthusiast

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🔗 SidraSaleem296



ABOUT ME

Passionate and driven, I am an adept undergraduate pursuing a Bachelor's degree in Software Engineering from Comsats University Islamabad. My journey has been marked by an unwavering curiosity in the realms of AI, Quantum Computing, and Cybersecurity. As an enthusiastic researcher, I've ventured into exploring the intersections of these fields, delving into projects that bridge Algorithmic Design, Large Language Models (LLMs), and cutting-edge technologies. I'm honored to be a research assistant, a role that allows me to engage deeply with these domains, applying my skills to the development of innovative solutions. My pursuits have led me to create and contribute to a diverse array of projects, from Cybersecurity platforms to Quantum Computing resources, all while maintaining an agile mindset that embraces challenges. Committed to lifelong learning, I continuously seek opportunities to expand my horizons and share my insights with fellow enthusiasts.

HOBBIES

Chess Learning more about history
Exploring new technologies Reading research papers
Writing what I observe

TOOLS/SKILLS

Programming Languages

Python Javascript Typescript C++ C Prolog
SQL React React-native Firebase Next.js
CSS HTML Streamlit SQL Server MongoDB
MySQL

DevOps and Tools

Docker Git/Github Jira Trello Linux
Bash Scripting

GenAI and ML

Algorithmic Design Large Language Models (LLMs)
LLM Fine-tuning (Langchain)
XAI (Explainable AI) Algorithms

Quantum Computing and Advanced Technologies

Quantum Computing Basics Qiskit Verilog

Cybersecurity

Reverse Engineering Binary Analysis Encryption

RESEARCH EXPERIENCE (1.5+ YEARS)

LLMs (Large Language Models)

Open Source

📅 2023 – 2024

- Explored large language models (LLMs) extensively during my academic journey. Worked with various LLMs like Vicunna, Lamma, Falcon, and Bloom, ranging from 2.5 billion to 175 billion parameters.
- Proficient in using the H2O AI tool for fine-tuning expansive LLMs. Collaborated on open-source projects, such as Petals, a chatbot web app with HTTP and WebSocket endpoints for LLM inference.
- Researched critical aspects like bias mitigation, model calibration, weighted samples, memory management, and latency optimization in LLMs. Extensive knowledge from LLM introduction to fine-tuning, transfer learning, and advanced techniques like few-shot and zero-shot prompting.
- Explored practical implications, addressing cost-effectiveness, model size limits, knowledge distillation, and data privacy. Developed expertise in software limitations, data preprocessing, confabulation, hallucination, parallelism, reinforcement learning, hyperparameters, model compression, and metadata handling in LLM contexts.
- Active commitment to advancing language model applications and contributing to AI and natural language processing advancements.

- 🌐 Github link for research material

Binary Classification with XAI

GNN and XAI

📅 2021 – 2023

- Collaborated on binary classification research using Graph Neural Networks (GNN). Aimed to enhance accuracy and interpretability in binary classification, inspired by the DeepReflect paper.
- Utilized GNNs and Explainable AI (XAI) methods, distinguishing from DeepReflect's auto-encoder approach. Employed tools like IDA Pro, r2pipe, and PE python libraries for analysis.
- Developed a repository hosting scripts for control flow graph (CFG) generation and assembly-to-CFG conversion. Created informative seminar showcasing the research findings.
- Curated a repository as a collection of research papers, tools, and references on binary classification, malware detection, and AI-driven security.
- 📺 Recorded Seminar

Software Engineering and Testing

Software Design and Architecture

Automated and Manual Testing Cypress

Documentation and Design

Technical Documentation

SRS, SDS, STP

LaTeX

Figma

LucidChart

SOFT SKILLS

Communication

Motivation

Creativity

Flexibility

Dedication

Empathy

Continuous Learning

COMMUNITY/CAMPUS INVOLVEMENTS

Guest Speaker, CSS Society

'Balance in Student and Work Life'

📅 2022

- Empowered fellow students with insights on maintaining equilibrium between academics and personal pursuits.

Guest Speaker, Seminar

'Future of AI and Cyber Security'

📅 2023

- Shared visionary perspectives in an enlightening seminar, exploring the transformative potential and ethical considerations of AI in cybersecurity.

Guest Speaker

Binary Analysis with Explainable AI Workshop

📅 2022

- Illuminated attendees with expertise in the intersection of binary analysis and explainable AI, offering innovative perspectives in cutting-edge fields.

Workshop Host

C3 Society Collaboration

📅 2021

- Facilitated an engaging workshop, enhancing the technical and collaborative skill sets of participants.

CSS Society Recognitions

Multiple Awards

📅 2021 – 2023

- Recognized by the CSS Society for creative initiatives and enthusiastic contributions, demonstrating a consistent commitment to excellence.

WORK EXPERIENCE

Research Assistant and LLM Engineer

Cytomate, Qatar



📅 2022 -2024, June

Enterprise Content Manager (AWS Technical Writer)

Sudo Consultants, Dubai

- 🔗 Github repository

CERTIFICATES

- QBronze in Quantum Computation (2021-2021):** QWorld
- Data Science in Python Proficiency Certificate:** Coursera
- MIT App Inventor Course:** Hong Kong University of Science and Technology
- Introduction to Quantum Computing Scholarship Course:** Qubit by Qubit (Sponsored by IBM Quantum)
- Machine Learning Specialization:** Coursera
- Machine Learning and Data Science Courses:** Udemy
- WordPress and Freelancing Course:** Digiskills - Ministry of IT Pakistan
- Introduction to Quantum Computing:** Qubit by Qubit
- Quantum Computing Roadmaps and Basics:** QWorld-Turkey
- Practical Ethical Hacking (Proficiency In Cyber Security):** Al Nafi (Partially Complete)
- AWS Cloud Economics:**  Credential
- AWS Partner Essentials Technical:**  Credential

EDUCATION

Bachelor's of Science in Software Engineering

Comsats University Islamabad

📅 2021 – 2024

FSc (Pre-Medical)

Army Public School & College (APS&CS)

📅 2019 – 2021

Matriculation

Shining Star Public School

📅 2017 – 2019

PROJECTS / CONTRIBUTIONS

React-Native Project

Developed a React-Native application

📅 2023

- The app leverages generative AI to create multiple-choice questions (MCQs). The app includes a chatbot interface for interactive learning and engagement.
- Demo on Expo Snack

Generative AI Medical Chatbot

Created a sophisticated medical chatbot

📅 2022

- The chatbot assists with medical queries and provides relevant information.

📅 2022 – Present

Product Based Article Writer

Wondershare

📅 2021 – 2022

Affiliate Article Writer


Amazon

📅 2021 – 2022

Reverse Engineering

Engaged in reverse engineering projects


📅 2021 – 2023

- Dissected software systems to understand their internal mechanisms and gained insights into software behavior.
-  GitHub repository

Explainable AI (XAI)

Created a repository exploring XAI techniques


📅 2022 – 2023

- Focused on interpreting and visualizing complex machine learning models for transparent decision-making.
-  GitHub repository

Inventory Management System (IMS)

Designed an intuitive IMS


📅 2022

- Facilitated efficient tracking, management, and analysis of inventory items.
-  GitHub repository

Monte Carlo Search Tree

Implemented a versatile Monte Carlo Search Tree algorithm


📅 2022

- Enabling decision-making in games, simulations, and optimization problems.
-  GitHub repository

College Management System

Utilizing MongoDB and SQL databases

📅 2022

- Designed a College Management System for efficient data storage and retrieval.
-  GitHub repository

AI Assistant

Developed an AI assistant using Python


📅 2022


- Employing natural language processing techniques to understand queries and provide relevant responses.

AI Accelerators

Investigated AI accelerators

📅 2022

- Optimizing AI model inference on specialized hardware architectures to enhance performance.
-  GitHub repository

-  GitHub repository

Next.js Project

Built a Next.js and TypeScript-based application

📅 2023

- Focused on robust performance and maintainability.

Cypress

Conducted comprehensive testing on two websites


📅 2022

- Included writing scripts, hands-on training with Cypress Studio, managing dashboards, and performing both API mocking and API testing to ensure application reliability.

Streamlit Project (RAG)

Developed a Streamlit application


📅 2022

- Integrates LangChain for vector embeddings to create a PDF-based generative AI chatbot. Allows users to upload a PDF and interact with its content through a chat interface.
-  Demo on Google Colab

Smart Diet Plan Agent (Prolog)

Created a Smart Diet Plan Agent


📅 2022

- Offering personalized dietary recommendations based on preferences and nutritional requirements.
-  GitHub repository

Genetic Algorithm

Developed solutions for optimization and search problems


📅 2022

- Using evolutionary principles.
-  GitHub repository

Bluetooth Controller Car

Crafted a Bluetooth-controlled car


📅 2022

- Showcasing skills in embedded systems and hardware programming.
-  GitHub repository

Electronic Dice

Engineered an electronic dice


📅 2022

- Using microcontrollers, providing an interactive and engaging dice-rolling experience.
-  GitHub repository

Encryptions

Implemented Python encryption and decryption code

📅 2022

- Incorporating techniques like base64 encoding for secure data transmission.
-  GitHub repository

Future of Cyber Security with AI

Collaborated on envisioning AI's impact on cybersecurity

📅 2022

- Analyzing AI-driven strategies for threat detection, prevention, and response.
- 🌐 GitHub repository

Cyberfy

Developed a robust cybersecurity platform

📅 2022

- Documentation with AI-driven threat detection and prevention mechanisms, enhancing resilience against cyber threats.
- 🌐 GitHub repository

AI and Nanophotonics

Explored the synergy of AI and Nanophotonics

📅 2022

- Investigating topics like Sigmoid Backpropagation for deep learning, bridging cutting-edge optics with AI capabilities.
- 🌐 GitHub repository

InsightEd

Final Year Project

📅 2023 – 2024

- Developed InsightEd, a state-of-the-art educational software aimed at revolutionizing the interaction between educators and learners.
- Utilized Generative AI technology to provide dynamic content creation, real-time personalized learning experiences, and efficient administrative functionalities.
- Addressed the limitations of traditional educational models by facilitating seamless integration of curriculum planning, assignment and quiz generation, progress tracking, and interactive chatbots tailored to specific course content.
- Designed to foster a community of collaborative learning with features for resource sharing, discussion forums, and virtual study rooms.
- Aimed to reduce administrative burdens on educators and enhance the educational experience for students through personalized content and interactive tools.

MY RESEARCH VISION

My research vision is firmly rooted in the pursuit of innovation and ethical advancement at the convergence of Generative AI, Cloud Computing, Quantum Computing, and Cybersecurity. I am committed to exploring the uncharted territories of these disciplines, unlocking their potential to drive transformative changes in technology and society. My goal is to contribute to the development of solutions that are not only cutting-edge but also responsible, transparent, and equitable. As an advocate for open-source principles, I firmly believe that technological progress should be accessible and accountable. In a world where data privacy is paramount, I am drawn to open-source projects that prioritize empowering individuals over data collection by big tech companies. By championing open-source initiatives, I aspire to create a positive impact by fostering collaboration, knowledge sharing, and ethical innovation in the technology landscape.