Layal Canoe

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About Me

Computer Science (AI track) senior with experience building intelligent, scalable systems across applied AI, NLP, and backend development. Strong focus on problem-first engineering and deploying reliable, real-world solutions beyond prototypes. Experienced in production-ready AI systems, REST APIs, and research-driven projects, with a growing interest in safe, explainable, and impactful AI.

EDUCATION

Effat University , Saudi Arabia, Jeddah
Bachelor of Computer Science, Artificial Intelligence
2022 – 2026 (expected)   CGPA: 3.97/4.00

Green Hills International School , Saudi Arabia, Jeddah
Highschool Diploma
2018 – 2022   CGPA: 4.00/4.00

RESEARCH

IEEE Conference Publication
Peer-reviewed research accepted at IEEE SCC Conference (Sousse, Tunisia). Paper presented by supervising faculty; primary research, implementation, and writing conducted by the author.

Revolutionizing Round Robin: Dynamic Time Quantum Scheduling for CPU Efficiency
Investigated limitations of traditional Round Robin scheduling caused by fixed time slices. Proposed dynamic time quantum strategies to improve CPU utilization, fairness, and overall scheduling efficiency.

Integrating AI and Cybersecurity in Powerline Communication Systems
Analyzed cybersecurity challenges in AI-enabled PLC networks used in smart grids and IoT systems. Explored AI-driven anomaly detection techniques and post-quantum cryptography as solutions for securing critical infrastructure.

The Quantum Frontier: Cybersecurity in the Age of Quantum Computing
Examined the impact of quantum computing on modern cryptographic systems. Analyzed post-quantum cryptography, quantum key distribution, and hybrid encryption models for securing future digital systems.

Ethical Implications of Computer Implants
Explored ethical, societal, and regulatory challenges of human microchip implants, focusing on privacy, autonomy, consent, and data security risks associated with bio-electronic technologies.

Enhancing Powerline Communication: Research and Application Design
Evaluated Powerline Communication as a scalable data transmission method for smart homes and industrial IoT. Studied technical constraints and translated research findings into a conceptual UI/UX application design.

Matrix Completion for Recommender Systems (Netflix Problem)
Studied low-rank matrix factorization techniques for recommender systems using a linear algebra perspective. Analyzed the recovery of missing user–item ratings and scalability considerations.

AI-Driven Medical Diagnostics Using Intelligent Imaging
Reviewed AI-assisted medical imaging techniques for early disease detection. Examined deep learning–based computer vision models, clinical integration challenges, and ethical considerations in healthcare AI.

Numerical Solutions to Initial Value Problems
Implemented Euler, Taylor, and sixth-order Runge–Kutta numerical methods in Python to solve differential equations. Compared numerical accuracy through tabular and graphical analysis.

EXPERIENCE

BMC 2026 Hackathon Participant
Project: dormOra — AI Dermatology Assistant Spring 2026

- Proposed and presented an AI-powered dermatology assistant for intelligent skin health analysis and personalized care
- Designed deep learning–based skin condition detection and severity scoring for acne, pigmentation, redness, and texture
- Developed a personalized treatment plan generator using LLMs aligned with dermatology guidelines
- Integrated lifestyle trigger analysis (sleep, diet, stress), ingredient safety checks, and longitudinal skin progress tracking
- Emphasized clinical responsibility through referral risk scoring and safety-aware AI design

Back-End Developer Intern
Breifiction Summer 2025

- Developed backend logic and RESTful APIs to support production web features
- Designed and optimized SQL and NoSQL database schemas
- Implemented authentication and basic security best practices
- Collaborated with cross-functional teams using Git-based workflows

PROJECTS

Semantic Multi-Agent Traffic Coordination System
Built a multi-agent smart traffic simulation integrating NLP preprocessing, RAG retrieval, Knowledge Graph reasoning, and LLM-based decision-making to coordinate traffic signals and routing using natural-language agent communication and synthetic edge sensor data.

Hajj Buddy AI (RAG-Based Assistant)
Built a retrieval-augmented AI assistant to guide Hajj and Umrah pilgrims using verified Islamic sources. Designed a hallucination-resistant RAG pipeline and deployed a live web-based chat interface emphasizing trust, usability, and accuracy.

Intrusion Detection System for IoT Networks
Developed a machine learning–based intrusion detection system using Random Forest, SVM, and deep learning models on ∼200,000 network samples. Focused on feature engineering, model evaluation, and real-time cyberattack detection in resource-constrained environments.

Music Map
Developed a full-stack web application for exploring global music trends. Built an interactive frontend using HTML, CSS, and JavaScript, and implemented a secure PHP and SQL-based admin panel supporting CRUD operations and basic authentication.

Mini Country Network Simulation
Designed a simulated enterprise-scale national network using Cisco Packet Tracer. Implemented ministry-specific VLANs, centralized DHCP, shared DNS services, and ACL-based traffic control to model secure inter-department communication.

Player Performance Analysis
Analyzed football match data to identify factors influencing player performance. Built structured datasets and applied statistical and exploratory data analysis techniques to uncover performance trends and insights.

ChargingZone – Powerline Communication Simulation
Designed a Raspberry Pi–based PLC simulation demonstrating data transmission over electrical infrastructure. Implemented a captive portal system simulating real-world

PLC interaction and aligned the prototype with academic research on smart grid communication.

To-Do List Desktop Application
Developed a Java Swing application for task and category management, supporting multiple task types, priorities, deadlines, and completion tracking through a graphical user interface.

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, Java, C++, SQL, PHP

AI & Machine Learning: Machine Learning, Deep Learning, Retrieval-Augmented Generation (RAG), AI Agents, LLM Integration (Gemini), Chatbot Development, Prompt Engineering, Natural Language Processing (NLP)

Data & Analytics: Data Analysis (Pandas, NumPy), Feature Engineering, Model Evaluation, Statistics, SQL Databases

Backend & Web Development: RESTful APIs, Backend Development, HTML, CSS, JavaScript, PHP, Basic Authentication, API Testing (Postman, Swagger)

Systems & Networking: Network Architecture, VLANs, DHCP, DNS, Access Control Lists (ACLs), Linux, Raspberry Pi, IoT Systems, Powerline Communication (PLC)

Research & Security: AI Research, Technical Writing, Ethical AI, Cybersecurity Fundamentals, Intrusion Detection Systems

Tools & Platforms: Git, Docker, Cisco Packet Tracer, Streamlit

Core Strengths: Problem-First Engineering, System Design Thinking, Analytical Reasoning, Team Collaboration

AWARDS

- **Dean's List Award** — Awarded for academic excellence during the 2022–2023 and 2023–2024 academic years

- **Queen Effat Award Nomination** — Nominated for outstanding academic performance and student leadership (2024–2025)

- **Effat University Scholarship** — Merit-based scholarship covering 50% of tuition fees, awarded for maintaining a high GPA

- **KAUST Academy AI Specialization (Stage 2 Selection)** — Advanced to Stage 2 after passing a competitive placement assessment for the KAUST Academy–Coursera AI program (2025)

RELEVANT COURSES

- Artificial Intelligence
- Machine Learning • Data Structures and Algorithms • Software Engineering
- Operating Systems • Probability and Statistics • Database Systems
- Discrete Mathematics
- Computer Networks