



# WAQAR MUMTAZ

## SOFTWARE ENGINEER

### ABOUT

Versatile Software Engineer with expertise in Image Processing, Computer Vision, and High-Performance Computing. I blend advanced programming skills with a drive for continuous learning to develop and implement industrial-strength solutions. My career showcases a commitment to innovation, from cloud-based AI applications to intelligent mobile systems.

### CONTACT

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### PROJECTS

#### Innovative Facial Recognition Attendance System

Delivered a scalable facial recognition attendance app for a 1000+ employee company. Features QR codes, GPS, and offline support.

**Tech Stack:** Kotlin, Android, MLKit (Google), CameraX, Facial Recognition, TensorFlow, FaceNet Model, QR Scanning, SQLite, GPS Coordinates, Remote Database Sync.

#### Custom ALPR Integration and Efficient API Pipeline on AWS EC2

Implemented robust ALPR pipeline with custom models (Jetson/EC2). Built C++ API using Docker on AWS for image processing & client result delivery.

**Tech Stack:** C++, Ultimate ALPR SDK, AWS EC2, Docker, Rest API

#### Fair Feeding Queue Management System

Developed a real-time queue management system for a non-profit feeding program. Prevents re-entry using facial recognition for fair distribution.

**Tech Stack:** Kotlin, Android, CameraX, Facial Recognition, Queue Management

#### Facial Recognition Photo Distribution for Event Planners

Developed the backend for a web app to automate event photo sharing using facial recognition. Streamlined process for event planners.

**Tech Stack:** Python, Django, DeepFace, OpenCV, NumPy, Django, S3, EC2

#### Liveliness Detection Anti-Spoof App

Delivered an Android face liveliness detection app with anti-spoof functionality. Achieved 12 FPS on Galaxy S20 FE for secure user verification.

**Tech Stack:** Kotlin, Java, C++, Android SDK & NDK, MLKit (Google), TensorFlow, Facial Detection & Recognition, Face Features Detection, Computer Vision, Edge AI

#### Drowsiness Detection System

Android app for real-time drowsiness detection. On-device processing (computer vision, ML) for immediate safety alerts.

**Tech Stack:** Kotlin, Android, Queue Management, MLKit, TensorFlow, Edge Computing

#### Amazon Alexa Smart Recommendations Skill

Alexa skill that recommends nearby places based on user preferences. Integrated with Google Maps for a navigation guide.

**Tech Stack:** Node.js, Alexa Skills Kit (ASK) SDK for Node.js, AWS Lambda

#### Parallel Approach towards Butteraugli

I have accelerated the Butteraugli image comparison algorithm by 2.2x using CUDA parallelization techniques.

**Tech Stack:** CUDA, C++, Google Open Source, Image Processing

## EDUCATION

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### **Master of Philosophy in Computer Science (M.Phil. CS)**

**Punjab University College of Information Technology, Lahore**

2016 - 2020

Specialized in Parallel Programming, Image Processing, and Computer Vision, concluding in a thesis focused on High-Performance Computing applications in Image Processing.

### **Master of Science in Computer Science (MSc. CS)**

**Punjab University College of Information Technology, Lahore**

2012 - 2014

Pursued my passion for technology, transitioning from a Commerce background to excel in Computer Science, with a focus on innovative computing solutions and advanced theoretical knowledge.

## WORK EXPERIENCE

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### **Full-Time Freelancer**

Mar 2023 – Present

Currently, I am engaged in full-time freelancing, delivering tailored solutions and services to clients across diverse projects and domains.

### **Backend Engineer – Future AI (Remote - Full Time)**

Jul 2020 – Apr 2023

During this role, I have assisted in projects related to Computer Vision, Edge Computing, Parallel Computing, Amazon Alexa, and OpenCV. I have used CameraX, TensorFlow Lite, RenderScript, OpenCL, and NDK for Android development and Mobile Application Speed Optimization.

### **Visiting Lecturer – Arid Agriculture University Joint Venture Burewala**

Semester Fall 2020 and Semester Fall 2015

Due to my interest in teaching, I have taught programming courses and conducted programming labs there as a visiting lecturer.

### **Software Developer – Self-Employed**

Aug 2018 – July 2020

In the field of software development, I've embarked on a self-employed journey. I've successfully developed and shipped desktop retail solutions for a fast-food café and men's garments shop. These systems feature core modules for inventory, sales, purchasing, QR scanning, label printing, and receipt generation.

## PROGRAMMING SKILLS AND AUXILIARY TOOLS

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**Languages:** Python, C++, Kotlin, C# (.NET), Java, JavaScript, CUDA

**Markup Languages:** XML, XAML, HTML, CSS

**Libraries:** MLKit, TensorFlow Lite, OpenCV, DeepFace, Pandas, NumPy

**Frameworks:** Windows Presentation Foundation (WPF), ASP.NET MVC, Entity Framework, Bootstrap

**Database:** MS SQL Server, SQLite, Entity Framework

**Cloud & DevOps:** Linux Terminal, Docker, Nvidia Jetson Configurations, CUDA & GPU Driver Configurations (Linux and Windows), AWS EC2, AWS S3

**Miscellaneous:** Git, Android NDK, REST API, Android Studio, Microsoft Visual Studio, VS Code, SQL Server Management Studio, Microsoft Office

## PROFESSIONAL INTERESTS

Computer Vision  
Edge AI/Computing  
Image Processing  
High-Performance Computing  
Better Coding Practices  
Teaching

## PERSONAL INTERESTS

Self-Improvement  
Resistance Training  
Free Hand Drawing  
Cooking  
Article Reading  
Music