Syed Mohiuddin Zia

CONTACT

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EDUCATION

M.E Computer Systems Engineering, Mar 2022
NEDUET, Karachi, Pakistan GPA 3.28

B.E Electrical Engineering, Mar 2019
DHA Sufa University, Karachi, Pakistan GPA 2.75

EXPERIENCE

II Solutions FZE Dubai Maritime City, UAE

UAV Payload and Avionics Engineer July 2024 – PRESENT

- Reverse-engineered the ViewPro A40TR gimbal camera, writing commands for movement (stop, forward, backward, left, right) and zoom (in and out). Developed a Python script to control gimbal movement at fixed yaw and pitch angles relative to the home position, along with feedback mechanisms for yaw, pitch, vertical and horizontal fields of view (FOV), and zoom levels.
- Conducted research and development on UAV detection and gimbal control systems utilizing Python, OpenCV, and YOLO on GPU with PyTorch for anti-drone systems based on RF sensors and PTZ cameras.
- Completed exercises and flight training on multiple UAV platforms to ensure proficiency in various operational scenarios.
- Practicing UAV flight simulation on softwares to enhance piloting skills and mission planning.
- Performed maintenance and troubleshooting of Ground Control Station hardware to ensure operational reliability.
- Researched Chinese datalink hardware for effective communication between UAVs and ground stations.
- Set up and configured the Holybro X500 UAV using Mission Planner software, integrating Orange Cube, Here3 GPS, and Herelink for enhanced navigation and control.
- Developed Python software to plot wind graphs for the next five days using open-source APIs, aiding in flight planning and safety assessments.
- Created a small name-labeling system for the company to organize and manage files efficiently.

Crop 2X, ICCBS - Technology Incubator and Industrial Park Karachi, Pakistan

Data Scientist July 2024 – January 2024 - March 2025

- Utilized statistical techniques and data visualization tools to explore large datasets, uncover trends, identify anomalies, and drive strategic recommendations that improved operational efficiency and business outcomes.
- Designed, trained, and evaluated supervised and unsupervised models to forecast key performance metrics, optimize processes, and support data-driven decision-making across various departments.
- Supervised the team of web application developer to revise the AI based web application.

Smart City Lab, NCAI, NEDUET Karachi, Pakistan

Technical Lead April 2024 - June 2024

- Lead the project **Advanced Driving Assistance System, (In-cabin)**. This system detects different actions performed by the driver and sends data to the cloud. Some of the actions that this system detects are using mobile phone, smoking cigarette, sleeping, yawning, head directions and seat belt.
- Lead the project **Advanced Driving Assistance System, (Out-cabin)**. This system detects vehicles, trees, person, animals and the distance between them and the camera. The lanes, ebra crossings, and signal system is also detected.
- Lead the project **Cattle Weight Detection System**. The user takes image of a cattle, after processing the weight of cattle is predicted using machine learning.
- Lead the project **Real-time Weapon Detection System**. If a weapon is detected, the sysem sends data to the cloud and an alarm sound is raised to alert the public.

Research Associate July 2023 - March 2024

- Developed a web-based Django application that speaks and listen for a KSA client. This application questions the patient in Arabic and decides whether to book an urgent, early or normal appointment with the doctor or to discharge the patient.

- Worked on a brush-less dc motor hub wheels speed and direction control. Integrated the wheels to BL-DC motor controllers to control the speed, direction and power of the wheels on 36v battery system.
- Fine-tuned the Whisper base model for Arabic using the Common Voice dataset, achieving optimal speech recognition accuracy using PEFT technique.
- Designed and developed the hand held carry device for Crop2X. This device is pocket size device that reads seven parameters from an RS485 sensor. Then it streams it in JSON format using Bluetooth protocol.
- Designed an android application using an online web application, to read the data from Bluetooth stream. It then fetches the coordinates and time of a mobile phone and sets the data including Bluetooth stream to the cloud.
- Worked on wind turbine. Mounted the wind turbine on the rooftop of CIS department NEDUET.
- Worked on RS485 communication based weather station. Decode the hexadecimal bytes to parse the nine parameters of weather. The data of weather station is later published on cloud.
- To monitor the power generation of wind turbine, the current and voltage were read. For voltage measurement a simple voltage divider is used to convert maximum 25 volts to 3.3 volts analog signal and for current measurement an ACS712 IC module for 30 amperes is used.
- An ADS1115 is used to convert 5 volts ACS712 current signal to digital. And then the digital data is transferred to ESP32 using I2C communication.

Research Assistant Dec 2021 - Jun 2023

- Worked for USA based client to develop an agriculture device based on LoRa master – slave communication.
- Designed and developed two different models. A server that sets and gets data from firebase to the remote terminal units. And an RTU that acts as slave to the server.
- Designed circuits on easy EDA designer and used LCSC library for electronic and assembly parts. And then used JLCPCB for PCB fabrications.
- Worked on mesh network to increase the range to transfer data at very long distance using LoRa devices in between.
- Worked to upload the new firmware over the air using mobile phone.
- Created the documentation of hardware and software of the project on GitHub for the public use as the project is open source https://github.com/frenziopen/FrenziTech/tree/main
- Worked on NVIDIA boards Jetson Nano, Jetson Xavier NX and Jetson Xavier AGX. Also prepared distinguishing documentation between these three boards.
- Worked and prepared documents for the flash installation of operating system on NVIDIA Jetson Xavier AGX and configuration of NVIDIA SDK components.
- Tested the rate of frames per second on Fujitsu 4GB GPU vs NVIDIA Xavier AGX while running a video. YoloV5 is used to detect weeds of a custom trained weight.
- Worked and prepared documents for realsense d435i depth detection camera, t265 tracking camera and l515 LIDAR camera. First worked on laptop and then prepared the environment for them to work on NVIDIA Jetson Xavier AGX board and installed realsense SDK.
- Installed python library pyrealsense2 for realsense cameras on NVIDIA Jetson Xavier AGX for custom program purposes and installed face recognition and identification libraries.
- Installed and worked on YoloV5 using Intel realsense D435i camera on NVIDIA Jetson Xavier AGX.
- Installed ZED SDK tools for ZED 2i is an industrial AI stereo camera for NVIDIA Jetson Xavier AGX and prepared documents.
- Worked on ZED 2i camera to prepare mapping of RCAI Lab to move 6 wheels robot around in lab.
- Designed a state of the art moving weedbot (an agriculture purpose robot) and also prepared thesis on it for master's degree completion. Rs485 communication is established between each slave of four legs of a robot that are controlled by master controller. The robot can move around and detects weed through camera. YoloV5 is used to detect weeds through custom trained weed model.
- Designed the mechanical, electrical, electronics and programming of reverse vending machine.
- Integrated IR proximity sensors for the presence and bottle size detection, Metal detection sensor to distinguish between metal cans and plastic bottles, Ultrasonic sensor for storage level. Compressor to compress the bottles.
- Worked on Reach RS2+ GPS device by Emlid that is a Multi-band RTK GNSS Receiver used for mapping.
- Worked on C099-FNP GPS device by UBlox that is a Multi-band RTK GNSS Receiver used for mapping. Used two similar C099 F9P devices and configured one as a base that is left on ground at a fixed position and other as a rover that gives corrected coordinates of an unknown position. Rover is attached to Arduino microcontroller to read the coordinates and further integrate in programming. Prepared a new library for easy to use purpose and published data on Robot Operating System.
- Worked on 9 degree of freedom sensor MPU 9250, contains three axis data of accelerometer, gyroscope and magnetometer. Calibrated and prepared a new library for easy to use purpose and published data on Robot Operating System.

DHA Suffa University Karachi, Pakistan

Visiting faculty staff at Internet of Things (IoT) NAVTTC Batch 3 Mar 2022 - Sep 2022

- Prepared and delivered presentation and lectures about Internet of Things. Held classes for 24 hours per week.

Visiting faculty staff at Industrial Automation (IA) NAVTTC Batch 2 Jul 2021 - Jan 2022

- Prepared and delivered presentation and lectures about Industrial Automation. Held classes for 24 hours per week.

Research and Development Engineer Jun 2021 - Nov 2021

- Prepared documents and also worked on PLC based tasks mostly on Allen Bradley and Siemens PLCs.
- Provided service for DHA Golf Clubs water sprinkling system for golf course. And documented its feasibility report.
- Worked as a PLC freelancer for Japanese university based Turkish company. Designed an HMI software for a Mitsubishi HMI and programmed software for Omron PLC. This system was designed for a medicine company and its purpose was to detect a tablet on a moving conveyer belt through camera and then pick it using moving arm and place it at a fixed position.

Research and Development Engineer Nov 2019 - Jun 2020

- Worked on Internet of Things and prepared documentations. Researched on MQTT protocol and Node Red software. The task was to decreasing the gap between information technology and operation technology.

Internship Jun 2018 - Aug 2018

- Built multiple projects and repaired multiple devices and documented for multiple tasks.

Mahwin Engineering Karachi, Pakistan

Research and Development Engineer Oct 2020 - May 2021

- Provided services for multiple industrial companies (i.e. Al Karam Textiles, Denim International, Hilal Foods and Engro Corporations).
- Worked on Siemens S7, S12 and S15 Plcs and designed HMIs on winCC software and programed S7 PLC software on step 7. Also worked on TIA portal for S12 and S15 PLCs.
- Designed multiple customized embedded devices for Industrial purposes that were difficult to find or were too expensive in market. (i.e. level meter, S5 programming cable and profibus slave device).
- Four weeks workshop is offered on behalf of Innovative Engineering and Mahwin Engineering. An Allen Bradley trainer was used to train the trainees at NAVTTC Batch 1, SSUET Karachi.

Trainee Engineer Jul 2020 - Oct 2020

- Mahwin engineering is the biggest Siemens sales and service provider in Karachi. Worked as a stock manager and automation engineer.

Distribution Dept. SSGC Karachi, Pakistan

Internship Jun 2019 - Aug 2019

- Visited areas of Korangi creek with a leak survey team and recorded leak surveys.
- Provided on call services and emergency services with an SSGC team.
- Studied reports and hierarchy of SSGC and Distribution Department. Studied notes to aware about the system of SSGC.
- Worked on SSGC GIS software and traced the coordinates of a gas meter through GIS software.

PUBLICATIONS

Design and Implementation of Static VAR Compensator Prototype *(Authors: Asif Gulraiz, Muhammad Usman, Ilyas Fakhruddin, Abdul Samad Shaikh, Mohiuddin Zia, Maria Ashraf, Syed Sajjad Haider Zaidi)*

Publication Link: Design and Implementation of Static VAR Compensator Prototype 2023

Development of cost-effective and easily replicable robust Weeding Machine – Premiering precision agriculture in Pakistan. *(Authors: Azmat Hussain, Hafiza Sundus Fatima *, Syed Mohiuddin Zia, Shehzad Hasan, Muhammad Khurram, Didier Stricker, Muhammad Zeshan Afzal)*

Publication Link: Development of Cost-Effective and Easily Replicable Robust Weeding Machine—Premiering Precision Agriculture in Pakistan 2023

ACADEMIC PROJECT

Robot OS based Electronic System Design for Four Wheeler Robotic Vehicle Karachi, Pakistan
*Project Link:*gdrive/thesis 2021 - 2022

- Designed a cutting-edge mobile agricultural robot, known as the 'WeedBot,' as part of my master's thesis project. The WeedBot utilizes an innovative RS485 communication system to coordinate the movements of its four-legged robotic platform, all controlled by a master controller. Equipped with a camera, the WeedBot autonomously navigates its environment and employs YOLOv5, powered by a custom-trained weed detection model, to identify and manage weed presence.

ACADEMIC PROJECTS

Atmospheric Water Generator Karachi, Pakistan
*Project Link:*gdrive/fyp-report 2018 - 2019

- Developed an atmospheric water generator utilizing a PID controller, where my contributions encompassed electronic design, simulation, and fabrication. Additionally, I was responsible for designing and fabricating the unit's housing, while actively participating in the creation of graphical elements.

CERTIFICATIONS

PIAIC Onsite, Karachi

- Artificial Intelligence

Coursera Online, Website

- Ethical Hacking Essentials
- Google Cybersecurity Action Team: Cybersecurity Essentials
- *Digital Transformation Using AI/ML with Google Cloud* Specialization Certificate
  - Business Transformation with Google Cloud
  - Infrastructure and Application Modernization with Google Cloud
  - Managing Machine Learning Projects with Google Cloud
- *Google Cybersecurity* Specialization Certificate
  - Foundations of Cybersecurity
  - Play It Safe: Manage Security Risks
  - Connect and Protect: Networks and Network Security
  - Tools of the Trade: Linux and SQL
  - Assets, Threats, and Vulnerabilities
  - Sound the Alarm: Detection and Response
  - Automate Cybersecurity Tasks with Python
  - Put It to Work: Prepare for Cybersecurity Jobs
- Artificial Intelligence on Microsoft Azure
- *Google IT Support Professional Certificate*
  - Technical Support Fundamentals
  - The Bits and Bytes of Computer Networking
  - Operating Systems and You: Becoming a Power User
  - System Administration and IT Infrastructure Services
  - IT Security: Defense against the digital dark arts
- Operating System Foundations

SKILLS

- **Relevant Coursework:** Embedded Systems and Microcontrollers, Industrial Automation, Artificial Intelligence, Robotics, Internet of Things, Cyber Security, Data Science and Analytics, Power Electronics and Electrical Engineering.
- **Programming Language:** Python, C++, Dart, Matlab, VBS, Javascript, Ladder Logic and Assembly Language.
- **Programming/ Flashing Software:** Microsoft Office, VS Code, Arduino IDE, MATLAB, Node Red, NVIDIA SDK, Android SDK.
- **Electronic Software:** Simulink, NI Multisim, LabVIEW, Proteus, Fritzing, Xilinx.
- **PLC Software:** WinCC, Step7, TIA Portal, Sysmac Studio, RSLogix 500, Easy Builder Pro, Win-ProLadder.
- **Graphics and Video Software:** Adobe Illustrator, Lightroom, Photoshop, Premiere.
- **CAD Software:** AutoCAD, LibreCAD and KiCAD, Tinker CAD (3D designing).
- **Networking Software:** Packet tracer, Wirehshark.
- **Operating Systems:** Windows, Ubuntu, Robot OS, Kali Linux, Remix OS and Raspbian OS.
- **Micro Controllers/Processors:** Arduino MCU, ESP8266/32 Node MCU, Micro python board, Raspberry pi board, Galileo board, Jetson Nano, Xavier AGX.
- **Communication:** Active Listener, Empathic, Feedback Oriented, Confident, Respectfull, Friendly, Responsive