Syed Muhammad Daniyal Gillani

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Work experience

Embedded Design Engineer | Cowlar Design Studio (YC-W17) | 21/07/2024 - 21/10/2024 | Islamabad, Pakistan

Designed and developed a cost-effective Kitchen Display System using the LVGL library, interfacing it with ESP32 S3 via a VGA connection. Integrated Wi-Fi, MQTT, and UART to receive API data and print receipts with a thermal printer, reducing hardware costs by 80% compared to traditional kiosk machines.

Programmed microcontroller firmware for IoT projects, focusing on sensor integration, peripheral interfacing, and seamless system operation.

Fabricated and manually assembled custom ESP32 S3 VGA PCBs, including soldering surface-mount components.

Utilized Git and GitLab for efficient version control and collaboration across the development team.

Biomedical Intern | National Center of Robotics and Automation, NCRA | 01/08/2023 - 12/09/2023 | Islamabad, Pakistan

Acquired hands-on experience in additive manufacturing by effectively operating and utilizing a 3D printer.

Gained proficiency in Altium, using it for schematic and PCB design to support electronics development.

Developed understanding of EMG Muscle sensors and Bionic hand movements.

Deepened understanding of Biorobotics and electronics.

Education & Training

BE-Mechatronics Engineering | National University of Sciences and Technology | 29/11/2021 - 06/06/2025 | Islamabad, Pakistan

CGPA: 3.42/4.00

Thesis: Humanoid Assistive Robotics Platform

Relevant Coursework: Electronic Circuit Design, Microcontrollers and Embedded Systems, Modelling and Simulation, Mechatronics System Design, Introduction to Robotics, Linear Control Systems, Solid Modelling, Digital Image Processing, Digital Logic Design, Signals and Systems, Instrumentation and Measurements, Special Topics in Mechatronics, Engineering Project Management

Skills

Programming Languages

C/C++ | Embedded C and IoT | Assembly | Python | Verilog | MATLAB

Microcontrollers and FPGAs

ESP32 | Raspberry Pi | Radxa Zero 3W | 89C51 | Arduino | Spartan 6 | NI Elvis | NI myRIO

Tools, libraries & Frameworks

Git | freeRTOS | ESP-IDF | ROS2 | Raspberry Pi Pico C++ SDK | Image Processing and Machine Vision libraries

Hardware & Manufacturing

PCB Designing | Soldering | Circuit fabrication | Machine Design and Workshop Manufacturing

Research and Analytical

Information Retrieval and Research Skills | Googling | Prompt generation | Writing

Soft Skills

Adaptability | Resilience | Communication | Problem solving

Projects

Final Year Design Project – Humanoid Assistive Robotics Platform | 09/09/2024 - 27/05/2025

Led the development of a socially interactive humanoid robot with autonomous navigation, face tracking, and context-aware dialogue using behavior recognition and LLM-based response generation.

Integrated speech recognition and voice-controlled teleoperation alongside MQTT-based remote control and passive SLAM for flexible human-robot interaction.

Designed and built a custom mecanum wheel robot base enabling omnidirectional mobility and stable navigation in dynamic environments.

Unified all modules—vision, facial animation, motion control—into a single ROS2 platform, removing hardware fragmentation and Wi-Fi dependency.

Managed a 4-member team with efficient Git-based collaboration for seamless hardware-software integration and version control.

Electronics, Signals and Control Systems | 10/03/2022 - 27/05/2025

Utilized control system techniques such as PID tuners, lead, lag compensators to fine tune the output response of various systems in MATLAB.

Designed and simulated various signal filter topologies and electrical circuits in MATLAB, Proteus and LTSpice.

Applied image processing techniques in MATLAB to extract meaningful data from image datasets.

Wooden Robotic Hand Simulation and Control | 16/12/2024 - 25/12/2024

Simulated a digital twin of a wooden robotic hand in ROS Gazebo. Developed a control system for the robotic hand using ESP32 and ESP-IDF, with servo motor actuation managed via a PCA9685 controller.

Integrated MQTT for wireless communication and real-time control of the robotic hand.

Tree Plantation Robot | 18/09/2023 - 25/05/2024

Engineered the mechanical design and resolved troubleshooting issues of Robot’s base, mechanism, and electronics.

Applied circuit design skills and techniques for the design and development of motor driver H bridge circuit PCBs.

89C51 Microcontroller Programming and PCB Design | 18/09/2023 - 10/11/2023

Programmed the controller for performing different arithmetic operations and sensor interfacing using Assembly and Embedded C programming.

Utilized microcontroller and circuit design techniques for the development of 89C51 microcontroller PCB module.

Publications

Design Patent - Humanoid Assistive Robotics Platform

Application No. 23849-D, filed 12/11/25, status: application filed (pending grant).

Controlled fluid flow without controlling pump through Arduino

2024. Ali, S., Gillani, S. M., Zain, S. M., & Khan, S. A. (2024). Controlled fluid flow without controlling pump through Arduino. Archives of Advanced Engineering Science.

https://doi.org/10.47852/bonviewaaes42022901

Management Experience

Wing Manager – NUST Volunteer Club | 11/09/2024 - 27/05/2025

Wing Manager for NUST Volunteer Club's Blood Donation Wing, responsible for ensuring blood donors are arranged immediately for patients.

Marketing Team Supervisor – Robotics and Automation Club | 07/09/2024 - 27/05/2025

Oversaw the development and execution of marketing campaigns and managing promotional activities, ensuring effective communication across various platforms to boost the club's visibility and engagement.

General Secretary of Promotions – ICRAI 2024 | 01/12/2024 - 20/12/2024

Spearheaded the promotional campaign for an International Conference on Robotics and Automation in Industries across multiple social media platforms and email.

Successfully led a team of six members to organize and execute promotional strategies, enhancing event visibility and engagement.

Collaborated with the Graphics and Event management team to ensure timely communication of event updates to target audiences.

Crafted engaging captions and content for posters, banners, and other promotional materials.

Technical Assistant – Robotics and Automation Club | 06/09/2023 - 06/09/2024

Trained more than 20 students in robot design, PID control, and hardware interfacing and helped them prepare for line follower robot competitions.

Certifications

Registered Engineer (Mechatronics)

Issuing organisation: Pakistan Engineering Council (PEC)

Registration No#: MECHATRO/005941

Coursera Certifications | 10/03/2023 - Current

An Introduction to Programming the Internet of Things (IOT) | Specialization

Scikit learn, Linear regression and other Machine learning | Guided projects

Introduction to the Internet of Things and Embedded Systems | Course.

Robotics: Aerial Robotics | Course

MathWorks Certifications | 01/08/2023 - 03/08/2023

MATLAB Onramp and Introduction to Image processing | Guided course

Honours and Awards

Merit Certificate for Distinguished Students | National University of Sciences and Technology | 10/05/2024

Rewarded the Merit Certificate for Distinguished Students for scoring SGPA > 3.5 in two consecutive semesters.

Merit Certificate for Distinguished Students | National University of Sciences and Technology | 28/12/2023

Rewarded the Merit Certificate for Distinguished Students for scoring SGPA > 3.5 in preceding semester.

Runner up – HSRC Logic Design Robot Category | HeadStart School | 11/03/2023

Runner up – Mini NERC Logic Design Robot Category | National University of Sciences and Technology | 06/01/2022

Volunteering

Arena Management – National Engineering and Robotics Contest NERC | 10/01/2022 - Current

Worked in designing and constructing the arena for Fruit Picking Robot contest in NERC 2022.

Language Skills

Mother tongue(s): **Urdu**

	Understanding		Speaking		Writing
	Listening	Reading	Spoken production	Spoken interaction	
English	C2	C2	C2	C2	C2