# Muhammad Usman Akbar

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## CAREER OBJECTIVE

Hardworking Electronics and Embedded System engineer with an ability to think analytically and find creative solutions to problems. Work with maximum potential in a challenging and dynamic environment, with an opportunity of working with diverse group of people and enhancing my professional skills.

## ACADEMIC BACKGROUND

| DEGREE | INSTITUTION | *YEAR* | DIVISION/CGPA |
|---|---|---|---|
| B.Sc Electronics Engineering | Islamia University of Bahawalpur | 2013-17 | 3.90/4.00 |

## RESEARCH INTEREST

Digital logic design
Embedded System
Nano Technology
Security
Very Large-Scale Integration
System on Chip
FPGA Based System
Circuit Design

## PROFESSIONALS EXPERIENCE

1. **Research Engineer at (R&D Wing) Military College of Signals Rawalpindi, Pakistan**
   **Duration:** 16th May 2019 to 28 Feb 2021

2. **Trainee/Internee at (KICS) University of Engineering & Technology Lahore, Pakistan**
   **Duration:** 1st January 2019 to 15th May 2019

3. **Teacher at HAYAT UL ISLAM Model High School Bahawalpur, Pakistan**
   **Duration:** 15th November 2012 to 25th October 2018

## PROGRAMMING AND SOFTWARE SKILLS

**Programming:** C/C++, MATLAB, Verilog/VHDL, Python
**Software: Xilinx and Libero_Soc** (Verilog/VHDL, FPGA)
**Multisim, PSpise and Electronics Workbench** (Circuit Design and Simulation)
**PyCharm** (Python, Machine Learning)
**LAB View** (HMI Designing)
**Microwind** (CMOS Layer Designing, VLSI)
**DSCH** (CMOS Schematic Design, VLSI)
**Proteus, EAGLE (**PCB Designing)

## RESEARCH AND DEVELOPMENT WORK

**Design of Operational Amplifier (LM 741):**
The task was to design an operational amplifier who perform all mathematical functions i.e. Summation, Differentiation and Integration etc. Model was first design on Multisim Software verify all the functions. Secondly same model was built on Breadboard by using 20 Transistors (NPN & PNP), Resistors and Capacitor. Verify different functions on Oscilloscope and finally convert this model on Printed Circuit Board (PCB).

**Robot movements control using Lab View (HMI):**
The task was to design an HMI in which different movements of Robot controls like Forward, Reverse, Left, Right, Start and Stop. Different buttons were made on the front panel of Lab View named according to the function like Forward. Established a wireless connection b/w Lab View HMI and Hardware Robot using HC-11 Bluetooth Module (Transceiver).

**Design of Buck & Boost converter using selective Switch**
Buck and boost converter were design on MatLab Simulink. Circuit was design by using selective switch which is either connected with buck side or with boost side. Both functions were verify on Simulink.

**Design of Stop Watch using Xilinx Software on FPGA (Spartan 3)**
Stop watch is design on FPGA by writing program. In this project I first write program on the ISE software in Verilog than this program is burn into the FPGA kit using J-Tag Cable and successfully verified.

**Professional Work:**

**Commercialized Projects:**

1. Design of Facial Recognition Based Security Door Lock and Attendance system using Raspberry Pi (KICS UET Lahore).
2. Design of an RFID ID Tags Based Locker system using Raspberry Pi and Arduino.

**FPGA Based Projects:**

1. Implementation of different Encryption Algorithm (i.e. AES, Camellia) on FPGA.

**Others:**

1. Calibration of Different Electronics Instruments (i.e. Spectrum, Network Analyzer)
2. Testing and measurements of different parameters of antennas (i.e. S11, VSWR and Gain).
3. Implementation of Generic Smart Card Reader using PIC Microcontroller.

## FINAL YEAR PROJECT

**Project: Smart Solar Grass with Lawn Coverage**
**Detail:** Smart solar grass cutter with lawn coverage is actually a smart robotic vehicle. Its area is Predefined as per requirement using Stepper motors. It also wirelessly control (100 meter) using nRF24l01 Module. Human Machine interface (HMI) of this vehicle were design on LabVIEW. Serial communication between hardware vehicle and LabVIEW HMI using HC-11 Bluetooth Module. The cutter will be controlled wirelessly from the remote area. The rover has ability of intelligent decisions. If we are afraid of losing control wirelessly the robot can be set to the auto mode it will perform its predefined task and will come back to the origin.

## COURSE AND CERTIFICATION

| Name | Duration | Institute |
|---|---|---|
| Chinese Language Course | 3 Months | TEVTA Bahawalpur |
| HSK Certificate (Level 2) | Exam | ICD Centre Lahore |

## ACADEMIC ACHIEVEMENT

3rd Position (Bronze Medal) in BS (Bachelor of Science) Electronics Engineering Department

## REFERENCE

Reference will be furnished on demand.