



Muhammad Zubair Sajjad

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EDUCATION

Lahore University of Management Sciences

July 2017 - May 2021

Candidate for BS (Electrical Engineering)

Relevant Courses: Electrical Power Systems, Power System Protection, Renewable Energy Systems, Smart Grids, Photovoltaic Systems, Electricity Markets

Punjab Group of Colleges

September 2015 - May 2017

FSc (Pre-Engineering) - **CGPA/Grade: A+**

Relevant Courses: Physics, Chemistry, Mathematics

Rangers Public School for Boys

April 2013 - June 2015

Matriculation (Science) - **CGPA/Grade: A+**

Relevant Courses: Physics, Chemistry, Mathematics, Biology

CERTIFICATIONS/TRAININGS

Certificate of appreciation for participating in NERC 19 awarded by Department of Mechatronics Engineering
NUST College of Electrical and Mechanical Engineering

Certificate of appreciation for securing 4th position in RPS system awarded by Pakistan Rangers educational institutions secretariat

EXPERIENCE

LUMS

Researcher - Electrical Engineering - Printed Electronics

July 2020 - Present

I am currently working on inkjet printing of an organic thinfilm transistor over flexible substrates using conductive inks. The main aim of this research is to make a completely inkjet printed transistor which has much shorter channel length and improved operating frequency than currently present OTFTs.

PROJECTS

Development of inkjet printed anticounterfeiting system and modules for smart relabeling system-

The aim of this project was to solve two major issues. The first issue was the global counterfeiting and piracy of products which has alarming economic and social impacts. In this project we developed an anti-counterfeiting system, by using near field communication, to ensure originality and authenticity of products. The second issue was that of relabeling of products at retailer stores. At large markets (i.e. wallmart, Carrefour etc.). A large quantity of products (i.e. meat/dairy products etc.) are wasted just because they could not be relabeled or put on promotion properly and timely. Using RFID technology we developed a relabeling system which will allow retailers to change the prices, track the information (expiry date, model number etc) and put products on promotions wirelessly, timely before they get expired. The long term of goal of this project was to develop both these systems in printed domain but development of complete printed systems was not in the scope of this project. So using inkjet printing, we printed some modules (i.e. a transistor, a battery and a solar cell) as a proof of concept.

BB8 DROID- A ball shaped robot which could move in all directions based upon the instructions given by a mobile application which communicated with the droid via a Bluetooth module installed in it. The droid was programmed using a PIC microcontroller fixed in the mechanism which was installed inside droid's body to control its movements. A special magnetic was also installed to keep the head of droid upright while moving. The body mechanisms as well as the application were completely developed by our group members.

Digital smart room -It was a smart room which had several automatically controlled functionalities. These functionalities included temperature regulation of the room, counting and displaying the number of people present in the room, switching on and switching off of lights based on number of people present etc. All these functionalities were implemented using counters, comparators, ADCs, logic gates, seven segment displays and other ICs without using microcontroller or any sort of programming.

Induction Heater – A 15V induction heater was designed in which a DC to AC Converter Circuit was made

using NMOS-Transistors with the two parallel LC circuits. The LC Resonant circuit set the AC Voltage frequency at 20KHz. The two parallel LC circuits were operated in such a way that one circuit was turned on at one instant while the other was turned off, at the very next instant the second circuit was turned on while the first one turned off. In this way an alternating current was generated which passed through the induction coil of copper and produced heat inside the coil

Research project: Smart energy production and consumption using Solar PV panels to reduce load on Central Grid “PROSUMERS”

Pakistan is one of those countries in which the problem of load shedding is one of the most critical problem faced by the citizens. There are several reasons to this problem including availability of limited resources, lack of infrastructure and many others. In this project a solar PV prosumers based smart solution was proposed to overcome the issue of energy crisis

in rural areas of Pakistan where transmission of electricity is not possible due to lack of infrastructure. The area of Shahkot, Pakistan was selected to deploy the system and obtain results. The user load demands in the selected region were obtained through a survey and a system was designed to fulfill those load demands independently without any coordination with the central grid.

ADDITIONAL SKILLS AND EXPERIENCE

Teaching Experience - 3 years experience of teaching students of various grades including O-levels, matric, FSc and lower grades.

AFFILIATIONS

IEEE Lums as a member of society

RPSB co-curricular club as a debates representative

HONOURS AND AWARDS

2015, Received fourth high achiever award in Rangers Public School and Colleges Pakistan and received PKR 10000 from Rangers headquarter.

2016-2017, Received a scholarship of PKR 200000/- from Punjab Group of Colleges Lahore

2019, Received best engineering design award in National Engineering Robotics Contest and received a prize of PKR 15000/-

Received several certificates in debates and writing competitions

INTERESTS

Research and development

Inkjet, gravure and screen printing

Robotics

Participating in debates and discussions

EXTRA CURRICULAR

Literature reading, poetry, teaching

Cricket, badminton