Ammar Rehan

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SKILLS

Programming Languages: C, Verilog/SystemVerilog, Assembly, R, Python, Matlab

Equipment Operation: 3D Printer, Soldering Iron, SMT, Oscilloscope, Spectrum Analyzer, Microscope, Glove box, Fume Hood, FPGA, PLC, PCB, Raspberry Pi, Arduino

Software: Solidworks, Ansys HFSS, Quartus, ModelSim, LTSpice XVII, Microsoft Office, SimuLink, Microsoft Azure, Visual Studio, Taggo, TTN, Arduino IDE, GitHub, Matlab, Linux

EDUCATION

University of British Columbia, Vancouver   **Sept 2015 – May 2020**
Bachelor of Applied Science in Electrical Engineering
Relevant modules: Digital Systems Design, Electronic Circuit Design, Antennas and Propagation, Control Systems, Machine Learning, Optimization of Power System Operation

RELEVANT WORK EXPERIENCE

Capstone Consulting Engineer, UBC, Vancouver   **Sept 2019- Present**
Client: TECHPOS International Corp, Vancouver
- Developed a smart inventory solution, intended for small businesses, by using weighted containers and Zigbee wireless communication protocol, via edge device (Raspberry Pi).
- Used Microsoft Azure IoT Hub and Microsoft PowerBI to receive, display and store weight and product count for each 'smart' container.
- Automated end-to-edge and edge-to-cloud live data tracking. Instantiated and tested multiple prototype devices.

Research Assistant, Center for Flexible Electronics and Textiles, UBC, Vancouver   **Jun - Aug 2019**
- Experimented with different mechanical exfoliation methods and substrates to isolate monomers of Graphene, Molybdenum Disulfide and Tungsten Diselenide.
- Mechanically stacked monomers creating PN-junctions further developing into advanced 2D solar cells.
- Designed and implemented a data collection and management process relying on collaboration using remote access and cloud for storage and easy access of acquired data. Resulting increased collaboration between researchers and improved method of data collection, reduced data loss exponentially and boosted productivity by over 300%.
- Helped develop python script to remotely control linear DC servo-motors for microscope analysis inside glovebox. Also used motors remotely for monomer stacking.

TECHNICAL EXPERIENCE

Aurora 5G Testbed Documentation and Expansion, UBC Radio Science Lab   **Oct - Dec 2019**
- Documented existing Aurora backhaul network configuration and evaluated performance of links using network tools.
- Designed Wi-Fi backhaul for adding new nodes into the Aurora testbed by identifying and connecting to mesh access points and designing links accounting for power and sensitivity.

LoRa Water Quality Monitor   **Jul - Aug 2019**
- Designed and 3D printed an enclosure for temperature and turbidity sensor to measure water quality in UBC buildings.
- Used Arduino to read and analyze data which was then sent and displayed on TTN using LoRa data connection implemented using LoRa-compatible antenna (915 MHz) connected to Arduino.
- Used FSM on Arduino to display readings on to LCD screen.

AM Radio   **Jul - Aug 2019**
- Developed toroid inductor and ferrite core transformer which were used as receiver antennas for AM radio. Also designed and 3d printed their enclosures.
- Implemented servo motor to tune variable capacitor without user interference. Developed iOS application using XCode to remotely control servo motor from iPhone using Bluetooth connection. Also added remote power control on iPhone using relay.
- Designed and implemented AM demodulation and amplification circuit utilizing TA7642 Integrated circuit and LM386 power amplifier circuit. Received 10 different AM channels and got an SNR of 46.2 dBm.

Magnetic Field Controlled Robot Car   **Jan - Apr 2018**

- Developed magnetic field transmitter (remote) and receiver (robot car) using EFM8UB2 microcontroller and PIC32MX microcontroller respectively. Used H-bridges, antennas, amplifiers, peak detectors to implement hardware.
- Added joystick control to remote and implemented automatic anti-collision system on robot using IR sensor.

Reflow Oven Controller Jan - Apr 2018
- Used AT89LP51RC2 Microcontroller to implement FSM and PWM to control reflow oven. Added button controls and LCD screen display to show oven state and temperature.
- Developed temperature sensor using thermocouple wire and a difference amplifier along with MCP3008 ADC.
- Developed loading and saving of parameter configurations using FT93C66 memory chip.

Smaller Technical Projects Sep 2018 - Apr 2019
- Filter Design and Simulation
- Biasing Transistors and Amplifier circuit simulation
- Multi-transistor Amplifier simulation
- Active Filter and Phase Shift Oscillator simulation
- RISC Machine design
- FPGA decryption using multiple cores
- FPGA FSM Music controller
- HDTV Receiver Antenna Field Test

OTHER WORK EXPERIENCE

Line Cook, The Sylvia Hotel and Restaurant, Vancouver Aug 2017- Jan 2018
- Using efficient time and resource management skills, managed grill and deep-fry stations. Also prepared and managed stock for these stations. Managed to do so with no prior experience and minimal training.
- Demonstrated effective communication skills and teamwork to serve excess of 1500 dishes in one shift during peak times with a total staff of four.
- Took initiative and streamlined inventory management and equipment cleaning and maintenance by refining closing protocol, resulting in a time decrease of over 57%.

Writer, Rehan Mobin and Company (Pvt) Ltd., Karachi Jun - Aug 2015
- Worked with surveyors to edit and proof-read insurance claim reports. Managed to service a group of 25 surveyors and edited upwards of 60 reports in a day.
- Educated new surveyors about English grammar and report writing techniques. Developed a methodical system to check reports for grammatical and structural errors which resulted in higher productivity and reducing proof-reading times by about 40%, increasing productivity by over 70%.

Project Management Intern, Hewlett-Packard, Karachi Jun - Aug 2014
- Mentee to senior project manager. Assisted project manager in drafting a statement of work, risk registry, conducting risk analysis and creating Gantt charts using online tools. Demonstrated teamwork and effective time management to produce timely results.

COMMUNITY LEADERSHIP AND OUTREACH PROJECTS

Mashal Academy, Volunteer, Karachi Aug 2014 – Mar 2015
- Worked as a Mathematics, English and Urdu teacher at a student-run organization dedicated to educating underprivileged children between the ages of 10 and 15 in Karachi slums.
- Repaired and painted walls and installed new desks, chairs and other furniture to enrichen the learning environment.
- Organized a field trip of 9 children to Jinnah Mausoleum.

Family Educational Services Foundation (MOVE), Team Leader, Karachi Nov 2012 – Feb 2013
- Organized a 'Clean your beach initiative' to clean Seaview, Karachi. Led the recycling team collecting and sorting trash resulting in a collection of 40kg of recyclable material.
- Coordinated with Gul Bahao, an NGO in Karachi for disposal of garbage and recycling collected material.

AWARDS AND CERTIFICATIONS
- Outstanding International Student Award -$10,000
- Chancellor's Scholar Award
- 5G Keysight Bootcamp
- Microsoft Certified Azure Fundamentals

INTERESTS
Forex and commodity trading, spontaneous traveling, cooking; managing resources and meeting new people; value relationships, loyalty and trust; poetry, photography, cricket, soccer, table tennis, badminton (casual).