Sawaiz Syed

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Relevant Work Experience

Georgia State University, Nuclear Physics Group   Atlanta, Georgia
Lead Hardware Developer   *January 2014 – present*

Design, assemble, and test various projects for the nuclear physics group. Test rigs, harnesses, and improved readout for local tests and data collection for cosmic ray research. CAD layout and electronic design of high voltage, radio communication, high speed signal, and embedded systems. Design for reducing cost of final product for production. Frontend, backend, and embedded software development using C, C++, JavaScript. Source control (Git, CVS). Create documentation for future users and development. Manage servers and computing recourses. Mentor and teach undergraduate physics students hardware skills. Manage and guide rest of hardware team, make critical design decisions. Take shift at RICH in PHENIX experiment at Brookhaven National Lab

Projects

– *MPPC power supply:* Precision high voltage boost converter with SPI control coupled with 24-bit ADC for temperature and bias read-back providing closed loop control.
– *MPPC sensor boards:* Small (25mm × 7mm) high speed (500Mhz-10Ghz) pre-amplifying and mounting assembly. Interfaced with Cat-5 cable providing power, signal, temperature, and test led control.
– *MPPC Interface:* Provides power, bias voltage, and other slow control along with high speed signal routing for 8 sensor boards. Multiple boards can be added to a backplane and controlled through a web interface.
– *Scintillator Panel:* Plastic scintillator sheets milled, and embedded with wavelength shifting fiber optic for improved light collection efficiency.
– *Wireless Geiger Counter:* IoT based low cost and power data logging Geiger tube wand based around the ESP-8266. Able to log data locally, or transmit to remote database. Designed for monitoring, surveying, and education.
– *mRICH:* Modular ring imaging Cherenkov detector (RICH) for the electron ion collider (EIC) project. Provides differentiation between $\pi^\pm$ and $K^\pm$ particles from collisions. First prototype Fermilab Beam-Test April 2016.
– *Coincidence Counter:* High speed (ns) signal readout, replacing KMEC crate modules with embedded systems for cosmic ray detection and logging.
– *Finger Hodoscope:* Finger scintillators with embedded fibers coupled to MPPC sensors providing position and angle of charged particles. Used for cosmic ray measurements, beamtest, muon tomography.

Roswell Telemetry   Roswell, Georgia
Embedded System Programmer & Electrical Engineer   *February 2012 – September 2012*

Port Atmel .Net Micorframework for over the air reprogramming. Constructed and maintained prototyping equipment including an aluminum forge and a 3D printer. QC and Debug failed hardware. Research materials for future improvement of products. Produced and tested field electronics for parking sensors and relay stations.

Education

Georgia State University   Atlanta, Georgia
Bachelor of Science, Physics   *2015*

Skills

Technical: Electronics Design and prototyping, Circuit Design, Soldering, Schematic Capture/PCB Layout (DipTrace, Eagle CAD), Embedded Systems (Atmel, Arduino, Espressif), FPGA (Spartan-6), Server and network management and construction, Robotics, CNC milling/cutting/printing, Remote Control and autonomous flight, Molding and Casting, Photography and Filmography.

Programming: C, C++, Web Front/Backend(HTML, CSS, Javascript, Node JS, Docker), Java, Shell, make, HDL, Python, SQL, Android SDK, G-Code, LaTeX.

Software Packages: Autodesk Suite, Adobe Suite, DipTrace, Eagle, Blender, Eclipse, Intellij IDEA, Audacity, SketchUp, Solidworks, MS Office Suite, CAM, Linux/Unix.

Natural languages: English, Urdu *(mother tongue)*, French *(elementary level)*

Achievements

Fermilab (+TLD Dosmitery etc.), Brookhaven Ntainal LabCITI Responsible Conduct of Research certification, 1st place Georgia Technology Fair in Robotics with Centrics IT scholarship (2010).

Organizations

PHENIX Society of Physics Students (Vice President/Treasurer), Science Olympiad (Lead Engineer), National Science Honor Society, Science Olympiad Judging – 62 Hours , Recycling Club – 60 Hours, SPS Tutoring – 80 Hours

Relevant Experiences

Designing and building wireless 40W laser cutter (85% complete). Have built, tested, and placed into production four 3D printers (Mendel Max, Mendel, Kossel Mini). Hardware development for Rep-Rap project. Setup and manage home networking and media, data, and backup servers hosted on domain. Contribute to open source projects.