

Sawaiz Syed

Last update on July 8, 2020

sawaiz@sawaizsyed.com • +1 678-457-2610 • Badensche Straße 40 • Berlin, Germany • 10715

Relevant Work Experience

Kolibri

BERLIN, DE

Founder

June 2020 – present

Design fully open source multi-material hardware that is extensively documented. Built web-page, store, order and inventory management processing system. Designed hardware, graphics, documentation, firmware, and media campaigns.

Products

- *Klais-16*: Large modular sixteen segment display ([docs](#)) made from stacked FR4 panels that is accessible to electronics hobbyists. Open source hardware certified [DE000087](#).

Smart Wins Technologies GmbH

BERLIN, DE

Chief Technical Officer (Technischer Leiter)

July 2017 – August 2019

Manage all technical aspects, architected and designed base system in full, implement hardware and firmware. Assisted in technical aspects of algorithm. Keep digital assets source controlled and manage permissions, identities, and secrets. Manage and mentor technical team and interns. Pitch to possible investors or partners and provide technical and feasibility insight into business decisions.

Roles

- *Hardware*: Design certifiable hardware (EE, layout, RF design and testing 868Mhz/2.4Ghz, 3D CAD for plastic housing) and optimize for production. Organize, manage, and label inventory used for development and small run production. Assemble (SMD to 0402 with and without stencil), test, and package prototype devices.
- *Firmware*: Write low power firmware for two microcontroller platforms and maintain the codebase. Local hosting and connecting on low power systems and bridging data transfer to Wi-Fi. Gateway that hosts configuration webpage, REST API, and can connect with DHCP and the provided DNS and out to the internet to work on most home networks. Separate firmware for communication with master chip on gateway and a sleepy node on the sensor (CC1310, TI SimpleLink, C++ with tooling in BASH).
- *Tooling*: Build applications, design test and programing jigs used for production, testing, and development. Plan and document programing and testing procedures for hardware. Test and teach procedure so quality control is maintained. Implement inventory and management system.
- *Design*: Website, UI, Packaging, Labeling, Housing.
- *Frontend*: Build device hosted frontend (HTML5/CSS/Vanilla JS) for space and bandwidth limited gateway, tested across browsers. Configure and manage saved networks locally over REST. Manage and provide feedback on AngularJS frontend.
- *Backend*: Original architecture for MVP designed with transitioned to Serverless for improved scalability and cost reduction. Archival and forwarding applications for data flow. Limited processing power REST backend on microcontroller hosting REST API to low level functions.
- *Security*: Source controlled cross platform secret store. Manage identity, permissions, and access to resources and accounts.
- *Algorithm*: Initial data analysis and preliminary algorithm design (CERN ROOT). Probe into additional methodologies for extracting leak data. Manage progress and testing of data analyst.
- *Operations (AWS/IBM Cloud)*: Manage servers, domains, DNS, and archival. Reduced total AWS costs by 54% over 1-month period while increasing stability though moving towards serverless architecture.

Georgia State University, Nuclear Physics Group

ATLANTA, GEORGIA

Lead Hardware Developer

January 2014 – present

Design hardware (EE, layout, and 3D CAD for HV, RF, High-Speed, microcontroller circuits) for manufacture and produce relevant software (web stack and embedded development using C, C++, JS with source control) and documentation. Manage computing resources (Scientific Linux, Debian, Centos, Arch). Mentor and teach undergraduate physics students at GSU. Manage internal hardware team, and represent group on site at PHENIX, and beamtests.

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 wand based around the ESP-8266. Logs data locally, or transmits to remote database for radiation monitoring and education.
- *mRICH*: Modular ring imaging Cherenkov detector for the electron ion collider (EIC) project. Provides differentiation between π^\pm and K^\pm particles from collisions. Prototype beamtest, Fermilab (April 2016, June 2018).
- *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

Embedded System Programmer & Electrical Engineer

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.

ROSWELL, GEORGIA

February 2012 – September 2012

Affiliations

GSU Nuclear Physics Group, PHENIX/sPHENIX, eRD14 PID Consortium, Brookhaven National Laboratory (GERT, Collider User Training), Fermi National Accelerator Laboratory (GERT, CAL, Controlled Access, Radiological Worker).

Education

Georgia State University
Bachelor of Science, Physics

ATLANTA, GEORGIA
2015

Selected Publications

Design and R&D of RICH detectors for EIC experiments	NIM-A 2017
Modular focusing ring imaging Cherenkov detector for EIC experiments	NIM-A 2017

Skills

Technical: Electronics design and prototyping, Circuit Design (HV, RF [868M/915M/2.4GHz], High speed [500MHz+], DFM), Soldering (to 0201), RF antenna matching and tuning, Reverse engineering, EMC testing, SPICE Simulation, Schematic Capture/PCB Layout (KiCad EDA, DipTrace, Eagle CAD), Embedded Systems (Atmel, Arduino, Espressif, TI-SimpleLink), FPGA (Lattice ICE-40, Spartan-6), Server and network management and construction, CNC milling/cutting/printing, 3D CAD for machining and assembly, Remote Control and autonomous flight, Molding and Casting, Needle and textile work, Precision Carpentry, Basic welding and metalwork, Photography (B/W film development and scanning) and Filmography.

Programming: C, C++, Web Front/Backend(HTML, CSS, JavaScript, Node JS, Docker), Java, Shell (BASH/ZSH/PS), make, HDL, Python, SQL, Android SDK, G-Code, L^AT_EX.

Software Packages: Autodesk Suite, Adobe Suite, Blender, Audacity, SketchUp, Solidworks, CAM, Linux/Unix.

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