Nicholas Smith Renner

EDUCATION

University of Pennsylvania (Philadelphia, PA) Sep 2017 – May 2019
M.S. in Embedded Systems | GPA 3.54

Tufts University (Medford, MA) Sep 2006 – May 2010
B.S. in Chemical and Biological Engineering

TECHNICAL SKILLS

Programming Languages:	Python, C/C++, Java, Rust, JavaScript, Bash, HTML/CSS, SQL
Web Frameworks/Svc.:	Flask, Django, React, Node.js; AWS, GoogleCloud
Tools & Platforms:	Altium, Atmel Studio, Git, Eclipse, Arduino, Pin, UPPAAL, LaTeX, AutoCAD, SketchUp
Hardware:	AVR, ARM, RaspberryPi, Samsung Artik, ESP8266

COMPETITION

Collegiate Embedded Capture the Flag 2019 (An attack-and-defend competition for designing secure embedded systems)

- Utilize a given Xilinx SOC hardware platform to build a "secure gaming system".
- Implement firmware, software, and communication protocols to protect the intellectual property of game designers, prevent users from loading their own software, and allow verified users to install and play purchased games.
- Perform security evaluation on opponent's system design, and hack vulnerable systems.

WORK EXPERIENCE

EnviroOne, an NGO (Philadelphia, PA) | Product Engineering Consultant (contract) | May 2018 – Present

- Developed solar powered IoT irrigation controller.
- Led end-to-end product development (i.e., business analytics, R&D, concept design, early prototyping and technicalities including PCB/ firmware testing and green house architecture).

University of Pennsylvania (Philadelphia, PA) | Research Assistant | May 2018 – Present

- Supported development of a new reproducible version of Docker containers, which guarantee the same output on every run.
- Architected new feature to intercept x86 instructions that violate reproducibility.
- Participated with paper, "Reproducible Containers for Bitwise-Exact Software Builds", submission to ASPLOS 2019.
- Performed systems programming in C/C++ using Linux ptrace.

Germantown Friends School (Philadelphia, PA) | Computer Science Teacher | Aug 2016 – Present

- Teach and design curriculum for "Object-Oriented Programming & Intro to Algorithms", "Data Structures & Intro to Computer Organization", and "J-Term" (elective) classes.

Integrated Symbiotics (Philadelphia, PA) | President/CEO | Jan 2014 – Mar 2018

- Developed/Managed IoT-based projects ["Aquaponics Controller" won 3rd Prize in Samsung Maker's Against Drought Challenge].
- Designed aquaponics and hydroponic system prototypes; conducted energy analysis/audits and developed engineering solutions for sustainable energy and water management.
- Wrote sales/grant proposals; developed marketing strategies, and oversaw operational logistics.

PhillyEarth (Philadelphia, PA) | Co-Founder/Lead Engineer/Project Manager | Jan – Dec 2014

- Planned/Oversaw/Budgeted the construction of greenhouse and aquaponics system. Raised $10K.
- Designed blueprints and authored system design documentation for hardware installation and plumbing; built an optimization plan to control greenhouse environment.
- Designed and installed full 1.0 kW off-grid PV and battery system for in-house electrical equipment.

Fort Smith Petro Environmental (Fort Smith, AR) | Director of Operations | Jan 2012 – Dec 2013

- Saved a money-losing emulsified oil reclamation plant with a business survival plan; transitioning from operating in the red ($250K lost) to growth and eventually outsized profits.
- Managed day-to-day activities (e.g., accounting, payroll, supervision of 6 employees, hiring, termination and staff development).
- Designed engineering plans and implemented/supervised a full 'Health, Safety and Environmental' program.