Robert H. Bayer

138 Rose Anne Loop, GA 31811 | 7064577090 | bayerhrobert@gatech.edu | US Citizen | Secret Clearance

Objective

Computer Engineering Major focusing on Cybersecurity and Computing Hardware/Architecture. Successfully launched an aquatics and safety service business with no funds that now turns a regular profit. Practiced Forward and Reverse Engineer with Secret Clearance seeking projects and work in Hardware, Software, and Firmware areas.

Education

Georgia Institute of Technology | Atlanta, GA *August 2022 - Present*
Bachelor of Science in Computer Engineering, GPA 3.5, 153 Credits Expected Graduation, May 2025

Skills

Programming: Java (Intermediate), Python (Intermediate), C (Intermediate), Assembly (Advnaced), C++ (Beginner)
Software: GitHub, 3D Slicers, Autodesk Inventor, Autodesk AutoCAD, Vivado (Beginner), Cadence, Altium Designer, IDAPro, OllyDBG, x86 Debugger, Intel PIN
Professional Organizations: National Society of Professional Engineers, Institute of Electrical and Electronics Engineers
Hardware: Basic Logic Circuit Design, Basic Energy Circuit Design, VHDL, SystemVerilog, Low-Level Driver Design, STM32, mmWave Radar

Experience

Georgia Tech Research Institute | Atlanta, GA *January 2023 – Present*
ICL Student Research Engineering Assistant – Co-Op & Internship

- Participate in a multitude of projects from low level board and FPGA design to high level software and systems design. See 'Projects' section for exhaustive list
- Work with FPGA and software designed radios to implement custom and secure waveforms
- Engineer and Reverse Engineer a multitude of STM based RF boards
- Implementation of optional 5G feature in open source 5G NR project.
- Pioneer work on mmWave radar technology for human-system interactions

Robert Bayer Ltd. Co. (ACE Aquatics) | Hamilton, GA *November 2021 – Present*
Owner Operator

- Generated over $6k in profits in the first 5 months of opening.
- Managed 1-2 employees and contractors to ensure all locations were being serviced.
- Expanded to pool servicing in the second year of operation.

Georgia Institute of Technology | Atlanta, GA *August 2023 – January 2025*
Senior Design Lab Student Assistant

- Lead classes and workshops for various hardware skills such as soldering and using different scopes.
- Offered consultations for students working on various design projects on recommendations for hardware.
- Worked on 3D printers, fabrication machinery, scopes, and other devices used in all sorts of designs projects.

Georgia Institute of Technology | Atlanta, GA *January 2023 – January 2025*
ARCS Systems Student Assistant

- Built, Imaged, and provided maintenance on end user devices running Mac OS, Windows, Ubuntu, and Red Hat.
- Provided support for various IT issues from devices and software to purchasing and networking.
- Effectively communicated with requesting staff to inform them what caused issues in understandable ways.

F.D. Roosevelt State Park (GA DNR) | Pine Mountain, GA *May 2018 – September 2022*
Pool Manager, Lifeguard, Lifeguard Instructor / Aquatics

- Delegated tasks to all team members to ensure optimal operation and equal effort from all staff members.
- Mediated conflict between patrons and staff to ensure the best possible outcomes for all parties involved.
- Encouraged team members to take on additional responsibilities to prepare them for future leadership.

Projects

mmWave Radar Head Tracking – *Embedded System Engineer* *January – May 2025*

- Utilize TI mmWave evaluation board and DCA1000 to find optimal configuration for facial scans
- Train CNN on collected samples with satisfactory accuracy
- Designed board to be integrated into an interior dash cam for easy installation

Software/Malware Reverse Engineering – *Reverse Engineer* *January – Dec 2024*

- Utilize static and dynamic analysis techniques in HexRays IDA Pro and OllyDBG to determine attack vectors and payloads of various pieces of malware
- Reverse engineered 6 malware samples of various OS complexity level from Michelangelo.1 on DOS to GreenCat2 on Windows 7
- Programmed IDAPro plugin to automate DOT graph generation, and Intel PIN tool to automate dynamic analysis

mmWave Radar Interlock System for UV Exposure Safety – *Embedded System Designer* *December 2024*

- Initial “back-of-napkin" system sketches and designs
- Researched current radar SoC solutions
- Ordered and tested industry accepted mmWave SoC module for system integration

Sonar/Thermal Interlock System for UV Exposure Safety – *Embedded System Designer* *October 2024*

- Implemented a design for a sonar triggered thermal imaging-based safety interlock
- Created multi-board design for initial system mock-up to cover 360 degrees

IRIG-B Timecode FPGA Implementation – *FPGA Engineer* *August 2024*

- Implement IRIG-B timecode encoding for time sensitive FPGA based system
- Designed the decoding algorithm for the receiving system

RF Beam Splitting Board – *Hardware Engineer* *August 2024*

- Given a basic design from systems engineer to implement on a board, designed device circuits from preliminary
- Conduct device testing on coupons to determine stack-up and waveguide

PCB Reverse Engineering – *Reverse Engineer, Board Designer* *March 2024*

- Without providing power to board, reconstructed a match in Altium Designer with same or similar parts
- Worked with software engineer to create a breakout that would allow for programming and debugging of board

Adjustable RF/IF Signal Up/Down Converter – *Test Engineer, Board Designer, HW/SW Engineer* *January 2024*

- Implement a STM32 based control program that allows testing of devices on an RF board
- Tested and verified functionality of devices on board and overall system
- Implemented changes required for full functionality in Altium Designer

SRSran 5G Outer Loop Link Adaptation – *Lead Developer* *January 2024*

- Implemented OLLA algorithm into an open source 5G NR project.
- Implement 5 new metrics to track and visualize link adaptation progress

Unjamming Signals in Busy Environments Using an FSL and LMS Filters – *Researcher* *June 2023*

- Designed visuals and diagrams to describe to new researchers and outside parties the goal of the project.
- Crafted overview statements and encompassing views of the problem the project is solving and how.

SCOMP Clap and Snap Detection Peripheral – *VHDL Engineer* *June 2023*

- Designed and implemented the VHDL design of a peripheral that takes in digital sound input and detects snaps, claps, and other loud noises.
- Created interfaces that allow for outside user interaction allowing for customizability to fit developer needs.

NFC PCB Business Card - *Project Lead/Designer/Presenter* *October 2022 – November 2022*

- Design and source components to store data on self-powered, energy harvesting NFC IC.
- Designed PCB to be easy to follow and understand on top of being functional.

Coursework

Data Structures and Algorithms, Circuit Analysis, Digital System Design, Foundations of Computer Engineering, Hardware / Software System Programming, Embedded Systems, ADV Computer Architecture, IC Fabrication, VLSI, Computer Networking, Malware Reverse Engineering, Hardware/Software Co-Design for Machine Learning,

Leadership

Eagle Scout *August 2012 – October 2018*

- Served as Senior Patrol Leader for several consecutive terms.
- Organized, lead, and reflected on troop meetings with the assistance of a Patrol Leader Council.

Clubs/Honor Societies

- Eta Kappa Nu - Member