ADVAITH BALA

+1-217-904-2901 | advaithbala@gmail.com | https://www.linkedin.com/in/advaithbala/

Education

University of Illinois Urbana Champaign, BS Aug. 2020 – May 2024
Major: Computer Engineering, Minor: Mathematics, GPA: 3.93 *Champaign, IL*

Coursework : *Computer Systems (OS & Kernel) Engineering, Computer Architecture, Applied Parallel Programming, Communication Networks, Computer Security, Digital Signal Processing, Linear Algebra*

Work Experience

Hardware Engineering Intern March 2023 – Present
Rivian Automotive, Inc. *Champaign, IL*

- Researched new communication protocols for automotive vehicles to minimize communication gateways
- Analyzed endpoint/edge signal groupings where an ECU may consolidate interfaces
- Determined the complexity of edge computing and how much horsepower is required to process the interfaces at the edge.

Computer Vision Intern July 2022 – August 2022
Remidio Innovative Solutions *Remote (Glen Allen, VA)*

- Spearheaded data science research to create a novel deep CNN model for cataract detection using phone images
- Formulated an Iris-Cropping mask algorithm to shrink patient dataset size by **200 times** without loss in quality
- Paralellized image prepossessing filters to decrease model run-time on the IOS app to **2.3 seconds**

Teaching Assistant and Grader Aug 2021 – Current
University of Illinois Urbana Champaign *Champaign, IL*

- **ECE 385, Computer Architecture**: Aided in teaching and debugging SystemVerilog projects
- **ECE 110, Intro to Electronics**: Planned course material, held weekly office hours, and hosted lab sections

Projects

Unix-like x86 Kernel and Operating System | *Embedded C, x86 Assembly* May 2022

- Wrote **x86 assembly** and **C** kernel code for a single core Unix-like operating system
- Implemented features like **read-write file system, paging, and segmentation** and **drivers** to support interrupts from devices such as keyboard, PIC, RTC, and Tux-Controller
- Created a **VGA-based Desktop GUI** and **shell** program that executes commands like **ls, cd, cat,** etc... through kernel-invoked system calls

FPGA Game Development: "Duck Hunt" with Wii remote | *SystemVerilog,C,Python* | video link Dec 2022

- Used **FPGA** with **NIOS II** as **SoC** to generate VGA signals, wrote custom Wii Remote **hardware drivers**
- Wrote a novel Python-to-SystemVerilog graphical library to convert GIF images to animated VGA game sprites
- Created robust **Game Difficulty AI** powered by random number seed generated by user input

MIDI Controlled Theremin | *Python, Arduino & C++, IC Circuit Design* | video link May 2021

- Built an analog theremin instrument from scratch and created 3D-printed robotic arm to play it
- Formulated python code that parses a MIDI file to an array that maps music notes to servo motor angles

ACTIVITIES

UIUC HKN (Eta Kappa Nu) ECE Honors society, Initiate and Service Member 2021 - Current
UIUC ECE Student Advancement Committee, Member of the Academic Committee 2021 - Current
Music Composition, Performance and Songwriting, Piano, Guitar, and more | portfolio link 2017 - Current
Dhirubhai Ambani International School Student Council, House Captain 2019 - 2020

Technical Skills

Programming Languages: Python, C/C++, Java, SystemVerilog, NVIDIA CUDA, x86 Assembly

Awards

James Scholar, Engineering college honors
Dean's List (all semesters)