

Ghassan Younes

Computer Engineer

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Skills

Languages & APIs:	Assembly (arm, amd64, mips, risc-v), C/C++, GLSL, \LaTeX , Matlab, Python, Swift, SystemVerilog, VHDL, Vulkan, ZSH/Bash
Equipment & Tools:	3D Printing, CLion, Keil μ Vision, Logic Analysers, Oscilloscopes, PCB Mills, STM32Cube, Visual Studio, Waveform Generators
Engineering Skills:	Bare-Metal Programming, Board Bringup, Control Systems, Digital Signal Processing, Electronics, Embedded Systems, Firmware/Software, FPGA, Git/SVN Source Control, Microcontrollers
Protocols:	CAN, I ² C, SPI, TCP/IP, UART, UDP, USB/USB-HID, ZigBee
Additional Skills:	Fluency in English, French, and Lebanese Arabic

Education

Bachelor of Science in Computer Engineering	April 2023
DigiPen Institute of Technology, Redmond WA, USA	<i>ABET and EAC Accredited Program</i>

Academic Projects

5amis-5tar - RISC-V implementation on FPGA	January 2023 — Present
<ul style="list-style-type: none">Utilized an Altera Cyclone II FPGA to implement a rudimentary pipelined RISC-V CPUDesigned and wrote VHDL modules for the data path – memory, ALU, registers, etc – and control unitImplemented 75% (30 instructions) of the RV32I instruction base	
Kermitron - Robotic Arm Mimicking Human Movement	September 2022 — Present
<ul style="list-style-type: none">Built a robotic arm using servo motors and rods to mimic human movement as a disability aid for individuals with reduced mobility or strength or as a tool to optimize repetitive motionsProgrammed a Raspberry Pi to communicate with the motors and generate a web interface for monitoringUtilized a Kinect 360 using an open source C library for user movement trackingSimulated arm movement and Kinect data using Matlab and Python	
D.A.R.T. - Semi-Autonomous Remote Vehicle	January 2022 — May 2022
<ul style="list-style-type: none">Modified the previous year's custom controller to manipulate a small treaded 'tank' to control it wirelesslyImplemented C code for IR and ultrasonic sensors for automatic override in the event of an imminent collisionDesigned a PID control system to monitor displacement, velocity, and accelerationImplemented wireless functionality using X-Bee communication modules using the ZigBee protocol	
Qamar - Hardware Remote Desktop Solution	September 2021 — December 2021
<ul style="list-style-type: none">Utilized a Zynq-7000 FPGA to implement a hardware solution for remote desktopImported and implemented HDL design blocks for HDMI, Ethernet, and USB interfacingInterfaced with Digilent's Pmod add-on devices for USB and character display implementationDesigned a rudimentary MIPS CPU using SystemVerilog to communicate with the host and guest machines	
Busy Bee - Custom Video Game Controller	September 2020 — May 2021
<ul style="list-style-type: none">Created a new and unique experience for playing computer gamesInterfaced with a 9-Degree of Freedom sensor to use gyroscopic controls for motion using embedded CWrote and optimized bare-metal programming and algorithms in C and C++ on the microcontrollerIncorporated the STM32 Nucleo development board as well as a character display, rotary encoders, and speakers alongside the default buttons and joystick	

Personal Projects

Vermicelli - *3D Graphics Engine built on Vulkan and SDL2* September 2022 — Present

- Designed a Vulkan engine in C++ using mailbox present mode for better frame allocation
- Wrote custom shaders using GLSL for rendering in 3D space
- Utilized uniform buffers for better render switching and optimal data storage
- Refactored render pass code to use dynamic rendering to optimize speed and performance

Rigatoni - *GNU/Linux Window Manager using Wayland* September 2022 — Present

- Built from the ground up in C++, the window manager uses a combination of tiled and floating windows
- Designed to be very lightweight and easy on system resources
- Learned more relating to low-level windowing protocols within Linux

Food Contribution Logger - *Seattle Community Fridge Mutual Aid Initiative* May 2021 — August 2021

- Built a device to anonymously track charitable donations to various community fridges in Seattle to determine which areas have a surplus or lack of a certain food group
- Prototyped a custom PCB for the ESP32 microcontroller and accessible buttons used in the project
- Designed and printed a custom chassis for the device
- Implemented rechargeable batteries and solar panels to make the device less reliant on the city's grid

Professional Experience

Owner - *Ghassan Younes Makes* April 2022 — Present

- Founded a leather-working business making and selling accessories such as bow ties, key chains, and cuff links
- Interpreted customer purchase data to optimize sales and identify which products were the most popular
- Sold at booths at local farmers' markets in Seattle which assisted in marketing and communication

Computer Engineering Lab Assistant - *DigiPen Institute of Technology* June 2020 — April 2023

- Maintained cleanliness and organization of the Engineering labs
- Restructured and optimized organization of the labs to ensure optimal ergonomic access and accessibility
- Ordered parts to ensure constant stock of consumable parts

Computer Environment Teaching Assistant - *DigiPen Institute of Technology* June 2020 — April 2023

- Collaborated with professors to give students hands-on experience with circuits and signals
- Programmed and tested assignments/exams in arm assembly to interface with the TM4C123 launchpad development board
- Graded students' work involving circuits with switches, integrated circuits, and relays

Leadership and Community Involvement

Founder and President - *SWANA Culture and Society at DigiPen* September 2021 — April 2023

- Provided resources for DigiPen students to explore South-West Asian and North African (SWANA) culture
- Led biweekly meetings with discussions relating to modern and historical events
- Invited guest speakers to share their stories and provide educational moments for participants
- Organized and led the committee for DigiPen's annual food festival, "The Dragon's Feast"

Computer Science and Engineering Council Chair - *DigiPen Student Government* September 2020 — April 2023

- Maintained the elected leadership role for multiple years
- Facilitated conversations regarding curriculum and school life in weekly meetings
- Voiced students' concerns and wishes regarding faculty decisions