Text for Projects and website:

First Sparks Project:

(Insert image of prototype)

This was the prototype for my first major project using Arduino. Prior to this, I had worked with Arduino in robotics and worked with a myriad of simple sensors for the robot. However, this was the first project I was completing completely on my own which came with many new challenges.

In 2019 I joined my schools newly founded science Olympiads, a club where schools from all over New York meet and compete in several competitions in a variety of disciplines. The challenge I was most eager to partake in was called Detector Building, it was a competition where students had to create a device that could read the temperature of water and output that temperature as well as using a light to indicate if that temperature was cold, temperate, or hot. I had never worked with temperature sensors before, but I had worked with light and displays so it was challenging to create a waterproof temperature sensor, but after using some hot glue and rigging I was able to make an accurate temperature sensor that was within 2 degrees of the actual temperature of the water.

(insert image of final project)

The fatal error

The competition was in early February, a month before the shut down in my area. I got to the classroom where the competition was held and spent time checking over my creation making sure everything was in order. To calibrate our devices, we were given 3 cups of water with known temperatures, as expected my device was relatively accurate within 2 degrees of the actual temperature. Then me and my partner had a proctor who went around with us to different stations to see how well our device performed on cups of water with unknown temperatures. This is where I made my fatal mistake, I was unaware of one rule. The temperature that the device had to output on the display needed to be in Fahrenheit, my device was calibrated for Celsius. The proctor said she had to take the temperature displayed by the device and I couldn’t convert the numbers in my head to give as an answer. The device was highly accurate, and the proctor even complimented us on this. Unfortunately, we did not rank too high at the end of the competition because of this fatal flaw. In the end, this project taught me an important lesson in attention to detail as well as sparked my interest in the field of Engineering and more advanced technologies.

About me page:

Sports:

During my time in high school, I was on 2 sports teams, I was on the badminton team since freshman year and was on the first ever boys’ volleyball team which started my senior year. I played singles in badminton and by my 2nd year I was a top 5 player on our team of 25 boys. I was the #1 boy’s singles player for our very short 2020 season and our relatively normal 2021 season and went to counties in senior year to end up around 15th in the county. I love the sport and continue to play it casually at Georgia Tech. Volleyball was a sport I always wanted to play, so I was very excited when they announced tryouts for senior year. I played as an Outside hitter and our team almost made it to counties despite it being our very first year. I would love to play the sport more at Georgia Tech but it’s a lot larger time commitment.

My name is Joseph Gabel, and I am an Electrical Engineering major at Georgia Institute of Technology, ironically my initials are JPEG which I find very fitting considering my interest in technology. I grew up on Long Island, New York in a suburban town about an hour East of New York City. I went to a public high school with a diverse population of kids, this lead to many lifelong bonds with people from different backgrounds and beliefs which made life a lot more interesting.

Growing up I loved technology; I had a leapfrog as a kid that I loved and played with for hours. Nothing could entertain me as much as technology could, whether it was a light up toy or a computer, I was always fascinated by technology. I started playing videogames as I got older playing games with friends on consoles like the Xbox 360. Eventually, in 7th grade I built my first computer after months of researching how to build them. Soon after, in 9th grade I built my first drone with the help of some friends who had more experience in the field. In 10th grade I made my first practical Arduino device after tinkering with them for years, and I’ve only been working with more technology since then. From CAD to PCB fabrication my love for technology is expansive and endless. If you want to see some of the things I’ve done with technology, then check out my projects!

PCB Project:

Fall 2021 Project - PCBs

I was first introduced to PCBs in 2019, it was to design a control panel for our robot. Being a freshman, I was more of an onlooker in the process than a person who actually touched the PCB. However, seeing the different colors and lines with symbols, letters, and numbers everywhere had me intrigued. Finally, 2 years later I was provided the resources to take a deeper dive into the fabrication of the PCBs. Georgia Tech has several maker spaces, the most prevalent one for undergrad students is the Interdisciplinary Design Commons also called the HIVE. There they have only 2 machines that require a certification to use, the Protomat and the Protolaser. I decided since I will be using The HIVE for the next 4 years I may as well get certified to use every machine they have.

So, I started with my goals, to learn PCB design and fabrication. Both goals were achieved to some degree, I watched about 2 and 1⁄2 hours of online videos on PCB design and learned about the programs used to design PCBs, the 2 main programs I learned to use were Eagle and EasyEDA design. Then came the guide videos, I navigated SUMS to The HIVE’s training videos and watched both parts taking note of every step. After taking the readiness test, I scheduled a checkoff for two weeks later.

I got to The HIVE and met up with a Peer Instructor (PI) named Madeline, she watched over my every step and wouldn’t tell me if I was doing anything right but would stop me if I was going to damage the machine. She was a 4th year EE major and told me about all the different things she’s used the Protolaster for. It was straightforward, and besides one alignment oversight I had no issues creating the small template PCB and passing the checkoff now granting me access to all the machines at the Interdisciplinary Design Commons.

This project taught me more about the different paths I can take in the ECE field and has made me question further how sure I am on what threads I want to go into. Hearing how Madeline was able to use the Protolaser to make antennas for communication sounds very interesting to me while also understanding the different materials they use and how tiny they can make the components of the PCB also interested me. Unfortunately, both concepts relate to different threads so eventually I will have to choose what I truly want to do.

As for the discovery project, I can say I learned a lot in a relatively short time, my next steps are to carry this idea forward. I will attempt to have my own personally discovery project next semester where I learn to do complex 3d printing using some of the resin 3d printers at The HIVE or other maker spaces.

Below is a video of my PCB being etched in the Protolaser as well as a close up of the front and back of the PCB:

Goals:

As each semester goes on, I want to expand my knowledge not only for my career but also for my hobby and love for technology. As I continue to pursue classes in the field of Electrical Engineering, specifically in Electrical Energy Systems and Electronic Device. I will also pursue two minors, one in Spanish as I plan to study abroad in Spain in Spring 2023, and I already have studied in Puerto Rico during Summer 2022. As well as another minor in Computer Science where I will learn more about machine learning and be able to use computers to the fullest to solve engineering problems.

However, semester by semester I want to learn a new hobby or skill. Whether it be a new machine or new coding language I want to become proficient in a variety of things which would allow me to be more creative in my innovation. For my first semester I learned how to design and fabricate Printed Circuit Boards. In the following semesters I plan to learn CAD, laser engraving, and more coding languages. Using what I learn from the previous semester to advance my learning in the following semesters.

I want to combine my passions into my career, with that being said I want to work in a field in which creativity and ingenuity combine. I want to combine my love for the outdoors with my love for technology and work on making products, devices, and systems that are efficient and sustainable. As well as an environment that promotes collaboration and the enabling of diverse ideas in order to find ingenuitive solutions to some of the world’s most challenging problems. I want to help as many people around the world as possible hence learning Spanish so I can work in many countries around the world and with a growing number of people in the US.

In 2021 I started my first year at Georgia Tech, a massive college in midtown Atlanta filled to the brim with nerds like myself. I chose to major in Electrical Engineering because I want to work with software and hardware. I always enjoyed the software classes I did in school, but I more so enjoyed the hands-on projects I did in clubs or on my own time such as soldering or Arduino or building computers for friends. A combination of the two lead me to decide on majoring in Electrical Engineering.

Welcome:

Here you’ll find a lot more information than a one-page resume and a cover letter can tell you. This website documents my studies, passions, projects, and hobbies. I’ll continue to keep this website up to date as I continue to pursue my degree in Electrical Engineering at Georgia Institute of Technology. Scroll down to find some of the projects I’ve done or explore around to find out more about me.

Traveling

China

Traveling is a passion I have had the fortune of enjoying for a long time. Whether it was a road trip to a city on the East coast or taking a 16-hour flight to the other side of the world, I always loved the idea of visiting and exploring a new place. In the Summer of 2019 at age 15, I was given the opportunity to travel with my friend and his dad to China. It was a challenging and life changing experience since only my friend spoke English. I spent 16 days traveling around the country from their home province in Fujian to Shanghai, even inland to Hunan. It was an amazing experience that gave me a global perspective that has changed the way I see the world.

Puerto Rico

Being Puerto Rican, this was a trip I wanted to do for a long time, so when I heard that there was a 5-week study abroad in Puerto Rico I jumped on the opportunity to go. We studied Latin American Music and Iboamerican Cities at the University of Puerto Rico Rio Piedras. It was a lot of work, each day we would have classes, homework, and excursions to places all over the island. However, it was well worth the work and my Spanish improved a lot. Moreover, I was able to connect to a culture that was mostly lost due to the practices of assimilation at the time my family immigrated to the US.

Scouting is the most likely origin of my love for traveling and exploring, I did Scouting for 10 years and achieved the rank of Eagle Scout in 2020. I loved going on a different excursion to a different location every month and getting to explore a new place. We would travel up and down the New England States and because of all my time spent camping I have a large appreciation for nature as well as a desire to maintain our ecosystem so others can enjoy it.

Working out is my passion and something I started during Covid when I was given a lot of free time to dive into the hobby. Georgia Tech has a large Campus Recreation Center (CRC) which I attend 5-6 times a week usually with friends and occasionally on my own. I plan to maintain my passion for weightlifting as well as expand it into other areas such as rock climbing and martial arts.

While I do not play games nearly as much as I once did, I must acknowledge the role it played in my interest with technology. One of the games that acted as a major influence was Minecraft, with its sandbox nature it gave me endless hours of fun. On top of that Minecraft was the first game I learned to modify, as in changing the game files to add content to the game. This is where my passion for coding started, learning to modify the game led me to learn to code as well as learning about making and hosting servers for me and my friends to play together.

My first semester project where I learned to design and fabricate PCBs.

Web Crawler:

My favorite project at my Summer 2022 Internship.

Intro

While working as an intern at Lewis Johs Avallone Aviles LLP, I was given many projects most of them involving some sort of technology. This project was my most challenging and most enjoyable. I was given this project by HR; they gave me a list of around 4000 names and asked me to use their names to find their addresses using the internet. I immediately started thinking of how I could code a solution to this problem. In the meantime, I split up the work with filing, so they started using the database to find the addresses of the clients while I started to code.

The process

While at home I did research on Python extensions and stumbled upon one called Selenium Webdriver which made this project extremely easy. At first, I was using a very complex website and it was not working well with Selenium frequently giving me time out errors, eventually I found a website appropriately called addresses.com which had a simple UI that made it easy to input a name, select a state and search for the addresses connected to those names. The only information I had to work with was the names of the clients and the fact that they lived in New York.

The solution

With this I created a program that takes a .csv file of names and outputs an Excel spreadsheet with addresses associated with those names, as well as what I called an “accuracy score”, for example if we searched for John Smith from New York chances are there are hundreds of people that fit that criteria so I would acknowledge that through this score that looked at how many results appeared for each name searched. It took around 3 to 5 seconds to search for each name, but with nearly 2000 names to look for after the filing room went through the database, it would still take a long time. To try to speed this process up I only had the program look at the first 5 names if that was an option. I reasoned that if the person doesn’t come up within the first 5 results they likely weren’t in the online database (I would use the accuracy score to confirm this). The final problem to tackle was the formatting, the addresses the website gave were not in the right format, so I had to make another program to split the full address up into multiple columns. In hindsight I could have put this into the original program, but it still got the job done.

The result

When given the original Excel file the address section was 20% complete, after working with the filing room to get names from the database by manually searching each name, they found another 30%. This left around 2000 addresses to be found, with my program I got the address section to 89.2% completed. HR was very pleased with the turnaround time and the accuracy of the spreadsheet. This project was very important as an insurance company that works with my company had a cyber-attack and the data of these clients was leaked so using the addresses, I found we were able to notify these clients of the possible security risk from the data leak. This project was a favorite because of all the new things I learned and the real-world effects this program had.

My LinkedIn is the most up to date place to find out about my current work activities. Connect with me on LinkedIn and send me a message!