**Hi, I'm Efrain**

I'm a Computer Engineer and front-end developer located in Houston, Texas.  
  
I enjoy finding solutions to complicated problems for both software and hardware applications. With my skills in HTML, CSS, and JavaScript I’ve been able to deliver dynamic web apps for an exceptional user experience. As for hardware, my skills in circuit analysis and embedded systems have provided me with the knowledge necessary to develop and assemble unique applications such as those found in robotics and the medical field.  
  
When I'm not coding or tinkering with electronics, you will find me playing guitar or at the local park scoring goals with friends.

### Robot

The autonomous robot project was designed to help us learn about embedded systems and software development. I was tasked to build, design and code a robot that could solve a maze and avoid obstacles using different types of electrical components. The electrical components used include: DC Motors, Distance Sensors, Bluetooth Module, and a Reflectance Sensor. I used the Tiva C EK-TM4C123GXL microcontroller from Texas Instruments as the heart of the robot. The code was written using the C language and it was debugged using Code Composer Studios the official IDE from Texas Instruments. The slide show below demonstrates the robot’s progression as it was being assembled.

After assembly and coding was finalized the robot was put to the test. Once powered ON, the robot was able to maintain its course and avoid all obstacles. This allowed the robot to solve a maze by detecting walls in its line of sight and altering its course accordingly. This process continued until the robot crossed the finish line at which point it stopped all its motor functions. The entire process was done completely autonomous. Check out code and videos for the autonomous robot, links below.

<https://www.ti.com/tool/EK-TM4C123GXL>

### Employee

This project is intended to facilitate employee access to a web portal and allow them to complete administrative functions. This web portal is designed to provide login authentication for all users. Every user will be verified and will be granted access to only their appropriate department links. The app is efficient and easy to use with all functionality readily available. Below are screenshots of the final product.

All users on the employee network can create an account, they can then use this account to login to their respective departments. When a user logs in, their credentials are authenticated, once logged in each individual user will have a role. This role will be used by the back end to identify what the user can and can’t access through the web portal. Once a user’s role has been processed all accessible links will be displayed and the user will be able to navigate to these links. If a user does not possess access to a specific role then the system will hide all links and render them inaccessible.

### CNP One

During my first co-op opportunity with CenterPoint Energy I was given the freedom to work for different departments. This provided me with distinct challenges all with their own unique solutions. I also had the privilege of meeting and working with exceptional people who helped me achieve my goals and from whom I learned a lot from. Below are images from a PowerPoint slide showing the work I did for CenterPoint Energy.

Under the Pole Attachments Department, I was tasked with finding a solution that would facilitate the storage of information and allowed the personnel to easily search and modify this data. To complete the project, I created the back-end and the front-end using VBA (Visual Basic for Applications) and SQL to request data from the database. This allowed me to provide an easy to use interface and a flexible program that allowed the personnel to quickly find the requested information. The program also included the ability to automatically generate emails further facilitating the ease of use for the personnel.

The second project under the Reliability Consulting Department required that a single report be generated at the start of every month from a collection of sub-reports. To accomplish this, I again used SQL and VBA to pull the necessary information from the collection of multiple reports. All the information would then be stored in a single report with appropriate formatting and highlights to make it easy to read and printable.

The final project under the Asset Management Department had me generate survival curves for different assets that the company owned. For this I implemented the Weibull formulas to help me predict the life expectancy of these various assets. I then used Microsoft Excel to generate the shape of the curve which allowed for easier visualization.

### Password Manager

The password manager project is currently in development. Its purpose is to store all user passwords to multiple websites and encrypting them using AES-256 for ultimate protection. The best part is this application will store passwords locally on the user’s machine. Which means that users will no longer worry about the cloud being compromised. Currently the project is being developed with Python as the back-end, SQLite as the database, and KivyMD for a responsive and robust user interface.

### CNP Two

For my second co-op opportunity with CenterPoint Energy I worked remotely and under the Distribution Projects & Lighting Design department. I had the opportunity to work on new projects and I had the privilege once again to work with my former team members who were excited to have me back. Below are images from a PowerPoint slide showing the work I did for CenterPoint Energy.

The first project I worked on saw the team waiting hours for Excel to produce crucial data from a set of formulas entered. The total number of data points where so large and the formals too complex that it caused excel to run sluggish. I solved the issue by creating a program using VBA (Visual Basic for Applications) that would take the values in the Excel field and run its own calculation using the same formulas. The results where phenomenal, the program was able to compute these values within seconds satisfying all the personnel.

The requirements for the second project was to provide users with a program that would download multiple Excel files from the internet easily and seamlessly. To achieve this goal, I designed my app using an Excel macro as my web scraping tool. Once completed the users would enter the dates of the files they wish to download followed by pressing the enter button and the files would be stored immediately on their local machine.

For my final project I was tasked with developing a program that would store SAP information and allow the user to export the queried data to Excel and generate automatic emails. I design the application using VBA (Visual Basic for Applications) as my front-end and I used SQL as my database to store the SAP data the user uploaded. App navigation is quick and easy, and all user were able to perform the tasks they requested.