



IOWA STATE UNIVERSITY

AEROSPACE ENGINEERING DEPARTMENT
COMPUTATIONAL TECHNIQUES FOR AEROSPACE DESIGN
AERE 361
PROJECT PROPOSAL
TEAM GIMLI

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I ABSTRACT

The abstract is a summary of your proposal. In general, your abstract should have enough information so that if I was to copy and paste your abstract into a web site, people would get the general idea of what your proposal is about. It should not go into any heavy detail, just the basics of what your project is about. The who, the what, and the why. You should keep your abstract to 200-400 words. Use this to “hook in” your reader.

II INTRODUCTION

While the abstract and introduction may seem like it is similar, remember that your abstract should have enough information to stand on its own. The introduction is really the actual start to your proposal. Here you should introduce the project, the people involved and give a short introduction to the why you are doing this. This should be 1-3 paragraphs.

III FEATURES

Your Features section must include a listing of at least three key features that makes your project unique. Each item needs to be backed up with a description of what it will do and why. A listing of just three items is not enough, you need to describe what those features are and why your group feels they are needed. For that reason your features should have a paragraph for each key item that describes what that key feature is. A key feature should be something that is significant to your project. For example, a key feature an autopilot system is the ability to be able to set an altitude and the autopilot will automatically set the airspeed. That is a significant feature that has a large impact on that system.

IV PROBLEM STATEMENT

Here you will go into more detail on what problem you hope to solve or address. You should discuss what the problem is and why it is important to solve it. In this section, you need to be clear on what the problem is, so do not think of this as a “light” section. It helps to define your project.

Your team needs to do some research into the problem at hand. Because of that, you should have around two to three references that you are pulling from. There are lots of places you can find references from including the ISU library and Google Scholar. I would also suggest looking at Adafruit’s website, as you may find inspiration or looking to improve something already there. Remember to cite your sources though. If you find something online, that can often be citation.

When you create your “ref.bib” file, don’t forget to follow the standards for a BiBTeX file. Certain things like webistes requires certain keywords for it to render properly. There are lots of sources online to help with this and many places like the ISU Library and Google

Scholar can also generate text that is compatible with a BiBTeX file. Once you have your Bib file ready, don't forget to cite your citations in your proposal like this [einstein] or this [dirac].

V PROBLEM SOLUTION

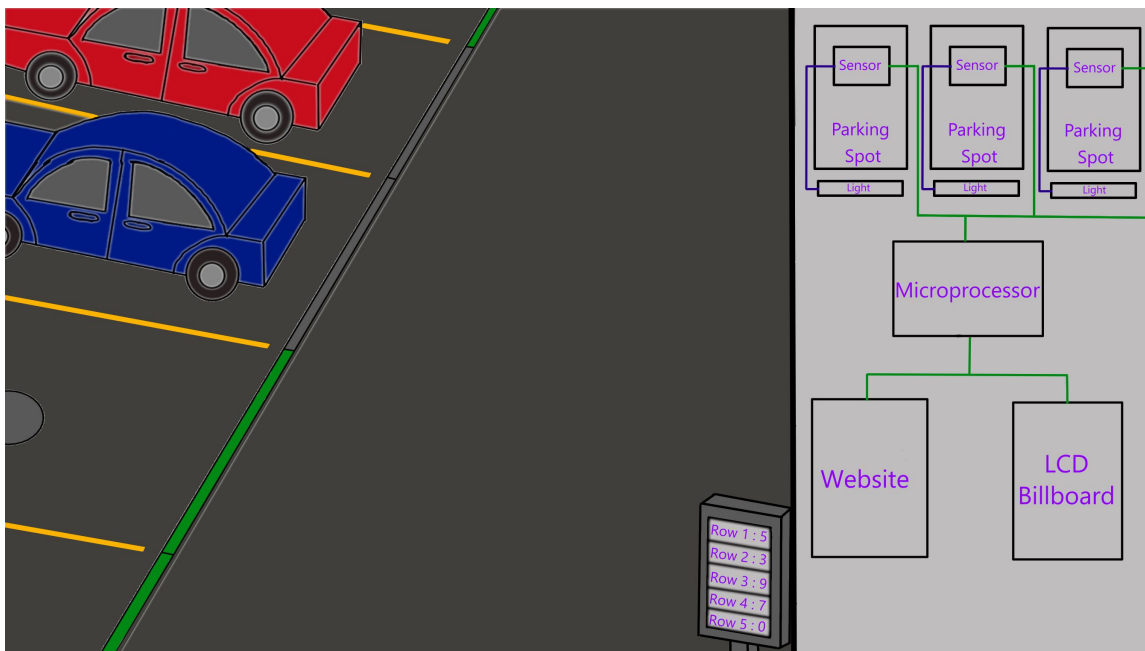


Figure 1: Example and Circuit Diagram

The solution that was decided on, is to place sensors in each parking spot to detect if there is a vehicle occupying it. This sensor can be a pressure, ultrasonic, or electromagnetic sensor. When a parking spot is empty a light strip at the entrance to the parking spot will turn green indicating the spot it open and available. When a vehicle drives into the spot and over the sensor, the light will turn off and a signal will be sent to the micro-controller (Adafruit Circuit Playground Express). The micro-controller will then update an LCD display positioned at the entrance of the parking lot, indicating how many open spots there are in each row. The micro-controller will also update a website with the number of spots open out of the total number of spots and a percentage of how full the parking lot is. These three functionalities will allow drivers to check if there are parking spots prior to driving over, update drivers who are looking for an open lot, and help indicate to drivers where free parking spots are. Figure 1 shows what a parking lot row would look like with our system implemented. The light strip at the base of parking spot are green when the spot it empty and off when the spot it filled. There is a billboard LCD at the entrance to the parking lot showing the breakdown of how many empty spots there are per row. On the right side of Figure 1 there is a breakdown of the wiring diagram for 3 parking spots. Each parking spot has a sensor and a light strip, which communicate with the microprocessor which updates the website and LCD billboard.

Table 1: Parts required for project

Part description	Qty
Adafruit Circuit Playground Express	1
AAA Battery Holder	1
USB Cable	1
Ultrasonic Sensor	3
Neopixel Strip	1
LCD	1

VI CONCLUSION

Finally, wrap up your proposal. This only needs to be one or two paragraphs, but it should conclude with what you plan to do and the why and how. Yes, this may seem repetitive, but that is intentional. Do not forget to update your references as those will appear below in a seperate page.