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**Project-Grow**

Automatic Environment Monitoring

For Grow Area

**AONGHUS O DOMHNAILL**

**Bachelor of Engineering (Honours)**

**in Software and Electronic Engineering**

Supervisor

Brian O’Shea

Galway-Mayo Institute of Technology

Project Graphic (Optional)

**Declaration**

This project is presented in partial fulfilment of the requirements for the degree of Bachelor of Engineering (Honours) in Software and Electronic Engineering at Galway-Mayo Institute of Technology.

This project is my own work, except where otherwise accredited. Where the work of others has been used or incorporated during this project, this is acknowledged and referenced.

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**Acknowledgements**

Use this section to acknowledge anyone, if you wish to, who might have helped during your project.

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# Summary

The summary should concisely summarise your whole project. Why? What? How? It should communicate:

The goal of the project.

* + Goal of project was to add automation to an indoor grow area with the aid of an environmental monitoring system.

The scope of the project.

* + For the project I grew 3 tomatoes and 2 cucumbers in a 3ftx3ft indoor tent. Used artificial lighting, a 250W metal halide for early growth and 1000W LED for mid to finish using only 120W electricity. For grow medium went with hydroponics in clay pebbles with a pump to circulate the water. There is an extractor fan and a circulating fan to control the air. The system is controlled by series of timers.

The important features of the project.

* + Frontend is built using React with Nextjs framework. Nodejs is used for backend.
  + Mongodb is used to store the data sent from ESP32 and hosted on AWS servers.

The approach to the project.

* + The main methods & technologies used.
  + What was accomplished.
  + The main conclusions.

The length of the summary should be 200-300 words, or fit on this page.

# Poster

Poster

# Introduction

Growing food at home has become increasingly popular in recent years. There was a huge growth around lockdown and people have got more conscious about sustainability. Also, with an increase on imports and higher costs. However, our climate restricts certain crops and time of year when you can grow.

Importing food results in higher costs and has a negative impact on the environment. Imported produce has to be harvested before it has ripened fully and later sprayed with ethylene gas to aid in the ripening process, resulting in less taste and less nutritious.

Growing our own food has many benefits. Not only must

# Background

You should change the title of this section to suit your own project subject. The aim of this section is to introduce to the reader any relevant background information that is required for your project.

You may have multiple ‘background’ sections. Think of any of the questions you had to answer during the research phases of your project – these likely should be addressed in a section like this.

# Project Architecture

Your project architecture diagram should go here. This is an important section, and one most readers of your report will view.

Your diagram should be self-documenting. Use subsequent sections in your report to elaborate on technologies / software / hardware in your diagram.

Figure 4‑1 Architecture Diagram

# Project Plan

# Heading

This is an example heading for a section in a project. You choose your sections to suit your project.

## Referencing

This is a subheading, use subheadings to break up a large topic into smaller sections.

IEEE referencing style is recommended the default style to choose for citations and referencing, however if you are familiar with a different referencing style then you can use that.

When you need to reference add a citation in the relevant sentence, usually at the end, before the full stop. Then have this numbered citation referenced in the list of references at the end of the document.

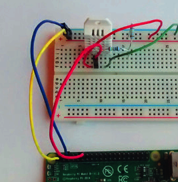
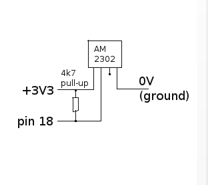
Here I might write something about something, e.g. image processing, and I need to cite my sources, like this [1]. Here I have used MS Word’s ‘Insert Citation’ feature, with IEEE style selected, to create that number inside brackets. Here’s another citation [2]. Word increments the number automatically. I can fill in the details about my reference now or later. I can then go the end of the document and create a page of references automatically. See the demonstration in class on this (also recorded via Teams). Here I am adding another citation [3]. And another [4].

You then need to insert a References section at the end of the document. In Word, choose References->Bibliography->References. This will pull all your citations into a reference page, as shown at the end of this document. The References section in this document also includes examples of further references that have not yet been cited in the text – to demonstrate IEEE style for different types of resources, i.e. books/websites/lectures/source code/etc.

You could also manually add all your citations & references, without using MS Word’s citation & referencing wizards.

## Notes on Content

Photographs are not technical diagrams and are not a good substitute for professional technical diagrams. Use photographs to enhance a report, but not as a replacement for diagrams.



V

Figure 6‑2 A photograph is not a replacement for a circuit diagram

In describing software, you need diagrams and/or summaries of software design & layout. It is not sufficient to just paste some code. You should describe what your code is designed to do, in English. If you decided to put your code in functions or libraries or objects, describe this architecture. One good layout is to include a snippet(s) of code alongside an explanation. You do not have to explain every part of your code, pick the important parts.

Write out any mathematical equations or calculations that are important in your project and explain them.

Include details of any major problems or challenges you encountered in an area, and how you solved them.

# Ethics

Include a short section on ethical considerations in your project or in the field of study of your project.

# Conclusion

Write a short conclusion. What is the outcome of the project? Perhaps you have a product prototype, or some results, or a demonstratable system.

Do not use your conclusion to tell the reader what you might have done if you had more time, but keep it focussed on what you actually have done. You can mention future opportunities for further development of the work, but keep this part short.

# Appendix

# References

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