CollegeEssentials - The app for students

Aaron Flanagan

Ciaran Brennan

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Advised by: Damien Costello

Department of Computer Science and Applied Physics
Galway-Mayo Institute of Technology (GMIT)

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About this project

Abstract: "Tech will transform from something we actively use to a more seamless integrated experience that is 'on' all the time." Daniel Baek, Co-founder of Nodes [1]. This paper proposes a new phone application that consists of the most important activities and features in demand for third level students around in Ireland. Feature's that can be accessed 24/7 and effortlessly by any user. The aim of this project was to create a suitable application that would benefit users in all aspects of their studies. Studies show that each household has an average of six devices connected to the internet. These consist of smart phones, laptops, computers and some household appliances. It was decided that this project would be developed for the most portable device held by users, mobile phones. Current deals with network vendors also allow the user to be connected to the internet through 3G or 4G technologies. All colleges maintain their own network for students also, this means that our application can be downloaded and used at all times.

Authors: This project was developed by two 4th year development students, Aaron Flanagan and Ciaran Brennan, as part of our Bachelors of Science honours degree in Applied Software Development.

Chapter 1

Introduction

The original idea for this project was the development of a facial recognition music application. The application would begin by capturing an image of the users face and running a mood capturing algorithm to determine the users mood, and it would then generate a play-list based on the users mood. This projects foreground was going to include an animated graphical user interface through the use of the JavaFX library made available by Oracle [2]. The background was running a facial detection program that was described by the OpenCV Team [3]. This algorithm was going to build upon to include facial recognition as it only produced facial detection on screen by drawing shape around the users face, but this needed a feature extraction algorithm to complete it and that's when the idea hit a wall. After many weeks of research and study into the different approaches of facial recognition and feature extraction it was found that there was no Java binding libraries to OpenCV or resources that we could use. After a week of searching nothing was found that could help us, but because it was still early into the year the project idea had to be changed as to avoid further problems and time delay.

It was now October/November and the project was still at the beginning, GMIT hosted a hackathon for other colleges with software development courses to develop a project over a two day period. This time was used to explain the problem and come up with a new idea and build upon it until a clear project goal and list of possible features where decided on. Damien Costello was informed about the problem and advised the project idea could be changed while it was still possible, he was understanding and suggested a few ideas of projects to think about and do some research into. Out of those ideas came our student application idea, the development of an integrated application solely for the purpose of third level students. He suggested doing something in augmented reality. It was thought upon and decided that the projects goal would be to build an application for students and include

the augmented reality section as navigation around the college. A list was constructed of things that tend to be a problem for students and academic staff managing multiple years of students. Further research was done into the market to see what was already done and available. Many developers have developed applications with timetables or notes for your phone screen but we couldn't find any that contained all of these sections integrated into one application, or that where just institution specific. After decided what kind of application was to be built, the platform technology had to be chosen, this included research into the available systems. Finally a list of features had to be narrowed down to include in the project, what features would be more beneficial and would provide better context to the final application.

Further into this report will contain a breakdown and give an in-depth explanation to how the project was approached and developed, the different software and technologies used, an evaluation of the final product and notes taken by the developers about each feature and where they can be improved and why. The following sections will be discussed about the application:

- Methodology: This explains the production approach taken to developing the individual features of the application and how the features where developed within the project time limit.

- Technology review: This section discusses the various technology platforms used, both hardware and software. It explains how the project uses each component and gives an explanation to why this particular system/software was used and what is was used for.

- System design: This section gives a breakdown of the projects architecture. How the system is built and how everything fits together.

- System Evaluation: This section evaluates each feature of the application and compares the finished project to the original concept first described.

- Conclusion: The final discussion about the project and evaluation of its finished state. Each section will be briefly concluded and it's main points will be stated.

This project can be found on Github under the name AaronFlanagan20 or CiaranB1992: https://github.com/AaronFlanagan20/CollegeEssentialsApp The repository contains a small ReadME file about how to download and run the application. The repository holds all the classes and native android files created and used by Android Studio to compile and run the project. Your computer or laptop must support virtualization, this can be checked

by attempting to install Intel's hardware accelerator software or by checking for in the task manager of your machine. If said machine doesn't support it, you will be unable to run the emulator, instead you must plug in an android device with the developer options enabled.

Chapter 2

Context

- The project was built with two questions in mind. What's needed and what are the benefits? With this application students will no longer lose their timetable, or have to search through hundreds of pictures on their phones or check on the college website. They can input their timetable directly to this application and it will be their forever. Students won't forget about that dreaded due date because this application informs them and doesn't let them forget about it. New students will not get lost because they can be directed around just by using there mobiles camera. They can also set their favourite places in their new town with the built in google maps feature.

- This application has one simple objective: make life easier.

- This report contains

- List the resource URL (GitHub address) for the project and provide a brief list of the main elements at the URL.

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Chapter 3

Methodology

About one to two pages. Describe the way you went about your project:

- Agile / incremental and iterative approach to development. Planning, meetings.

- What about validation and testing? Junit or some other framework.

- If team based, did you use GitHub during the development process.

- Selection criteria for algorithms, languages, platforms and technologies.

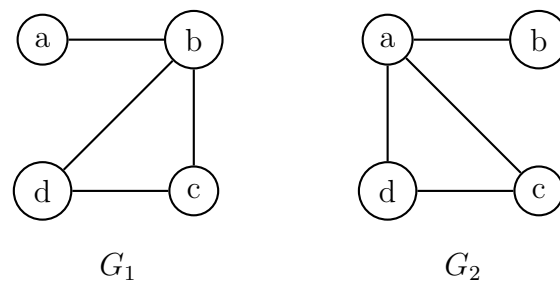Check out the nice graphs in Figure 3.2, and the nice diagram in Figure **??**.
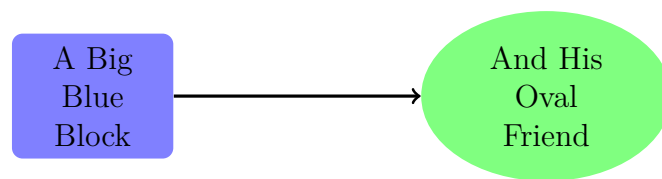

Figure 3.1: Nice pictures

Figure 3.2: Nice pictures

Chapter 4

Technology Review

About seven to ten pages.

- Describe each of the technologies you used at a conceptual level. Standards, Database Model (e.g. MongoDB, CouchDB), XMl, WSDL, JSON, JAXP.

- Use references (IEEE format, e.g. [1]), Books, Papers, URLs (timestamp) – sources should be authoritative.

4.1 XML

Here's some nicely formatted XML:

```xml
<this>
  <looks lookswhat="good">
    Good
  </looks>
</this>
```

Chapter 5

System Design

As many pages as needed.

- Architecture, UML etc. An overview of the different components of the system. Diagrams etc... Screen shots etc.

Column 1	Column 2
Rows 2.1	Row 2.2

Table 5.1: A table.

Chapter 6

System Evaluation

As many pages as needed.

- Prove that your software is robust. How? Testing etc.

- Use performance benchmarks (space and time) if algorithmic.

- Measure the outcomes / outputs of your system / software against the objectives from the Introduction.

- Highlight any limitations or opportuni-ties in your approach or technologies used.

Chapter 7

Conclusion

About three pages.

- Briefly summarise your context and ob-jectives (a few lines).

- Highlight your findings from the evalua-tion section / chapter and any opportuni-ties identified.

Bibliography

[1] D. Baek, "We take pride in awesome mobile app development." `http://www.nodesagency.com/`. Accessed: 2016-03-09.

[2] M. Pawlan, "What is javafx?." `http://docs.oracle.com/javafx/2/overview/jfxpub-overview.htm`. Accessed: 2016-03-10.

[3] opencv dev team, "Face recognition with opencv." `http://docs.opencv.org/2.4/modules/contrib/doc/facerec/facerec_tutorial.html`. Accessed: 2016-03-10.