**Musical Highlighting Application**

**Cosán Ceol – A Journey Through Irish Music**

**Rebecca Ann McGowan**

**13402658**

Final Year Project – 2017

B.Sc. Computer Science and Software Engineering

****

Department of Computer Science

Maynooth University

Maynooth, Co. Kildare

Ireland

A thesis submitted in partial fulfilment of the requirements for the B.Sc. Computer Science and Software Engineering.

Supervisors:

Mr. Thomas Lysaght,

Dr. Joseph Timoney,

Dr. Thanh Thoa Pham Thi

Contents

[Declaration i](#_Toc445718342)

[Acknowledgements ii](#_Toc445718343)

[Abstract iii](#_Toc445718344)

[List of Figures iv](#_Toc445718345)

[List of Tables iv](#_Toc445718346)

[**Chapter one: Introduction** 1](#_Toc445718347)

[Summary 1](#_Toc445718348)

[1.1 Topic addressed in this project 1](#_Toc445718349)

[1.2 Motivation 1](#_Toc445718350)

[1.3 Problem statement 1](#_Toc445718351)

[1.4 Approach 1](#_Toc445718352)

[1.5 Metrics 2](#_Toc445718353)

[1.6 Project 2](#_Toc445718354)

[**Chapter two: Technical Background** 3](#_Toc445718355)

[Summary 3](#_Toc445718356)

[2.1 Topic material 3](#_Toc445718357)

[2.2 Technical material 3](#_Toc445718358)

[**Chapter three: The Problem** 4](#_Toc445718359)

[Summary 4](#_Toc445718360)

[3.1 Project UML documentation 4](#_Toc445718361)

[3.2 Problem analysis 4](#_Toc445718362)

[**Chapter four: The Solution** 5](#_Toc445718363)

[Summary 5](#_Toc445718364)

[Depending on your type of project, you may not need to include all of these: 5](#_Toc445718365)

[4.1 Analytical Work 5](#_Toc445718366)

[4.2 Architectural Level 5](#_Toc445718367)

[4.2 High Level 5](#_Toc445718368)

[E.g. Packages, Class Diagrams, etc. 5](#_Toc445718369)

[4.2 Low Level 5](#_Toc445718370)

[E.g. Method specifications, Algorithms, etc. 5](#_Toc445718371)

[4.2 Implementation 5](#_Toc445718372)

[**Chapter five: Evaluation** 6](#_Toc445718373)

[Summary 6](#_Toc445718374)

[5.1 Solution Verification 6](#_Toc445718375)

[E.g. use your equations to verify the correctness of your solution 6](#_Toc445718376)

[5.2 Software Design Verification 6](#_Toc445718377)

[5.3 Software Verification 6](#_Toc445718378)

[5.3.1 Your test approach (i.e. unit testing, sub-system testing, system testing) 6](#_Toc445718379)

[5.3.2 Your tests (e.g. scenarios, test cases, test data, etc.) 6](#_Toc445718380)

[5.3.3 Your test results 6](#_Toc445718381)

[5.3.4 An interpretation of the results 6](#_Toc445718382)

[5.4 Validation/Measurements 6](#_Toc445718383)

[5.4.1 Results 6](#_Toc445718384)

[5.4.2 Explanation of Results 7](#_Toc445718385)

[5.4.3 Analysis of Results 7](#_Toc445718386)

[5.4.4 Comparison with previous solutions (if relevant) 7](#_Toc445718387)

[**Chapter five: Conclusion** 8](#_Toc445718388)

[**Summary** 8](#_Toc445718389)

[**5.1** **Contribution to the state-of-the-art** 8](#_Toc445718390)

[**5.2** **Results discussion** 8](#_Toc445718391)

[**5.3** **Project Approach** 8](#_Toc445718392)

[**5.3** **Future Work** 8](#_Toc445718393)

[**References** 9](#_Toc445718394)

[**Appendices** 10](#_Toc445718395)

[Appendix 1 Schematic of the hardware associated with this project. 11](#_Toc445718396)

[Appendix 2 Code developed for this project. 12](#_Toc445718397)

[Appendix 3 UML Class, Use Case and sequence diagrams for this project. 13](#_Toc445718398)

[Appendix 4 Screen shots of the project implementation 14](#_Toc445718399)

## Declaration

I hereby certify that this material, which I now submit for assessment on the program of study as part of B.Sc. Computer Science and Software Engineering qualification, is *entirely* my own work and has not been taken from the work of others - save and to the extent that such work has been cited and acknowledged within the text of my work.

Signed: Date:

## Acknowledgements

I would like to thank my supervisors, Mr Thomas Lysaght, Dr Joseph Timoney and Dr Thanh Thoa Pham Thi for their continuous help throughout the process of this project. Their guidance and feedback allowed me to progress. I would like to thank my classmates in their constant support during the project, providing feedback and helping with any testing I required. Lastly, I would like to thank all sources that have helped me achieve completion on this project.

## Abstract

The outline of the project is to create a music highlighting application with the aid of Google Maps. As we know, Google maps is an online mapping tool allowing users to search around the globe for locations. This project has incorporated this idea, with markers highlighting the history of Irish music, focusing solely on Ireland. There are many segments in Irish music, so it is important to display all segments to avoid isolating any. These segments can be divided as follows:

* Irish Traditional Music
* Folk Music
* Showbands
* Country Music
* Irish Rebel music

These categories have originated for different reasoning’s, but all have become a key factor in identifying Irish culture. It is due to these categories that Irelands rich history and heritage is known and admired globally.

This admiration has made Ireland an ideal location for festivals celebrating the rich history it beholds. This project displays not only the musical talent it withholds, but displays upcoming events that celebrate the musical talent.

## List of Figures

[Figure 3‑1 UML class diagram overview for this project. 4](#_Toc445718606)

## List of Tables

[Table 2‑1 Table of interest: Aspect of your implementation 2](#_Toc445714278)

[Table 2‑2 Data sources used in your implementation 2](#_Toc445714279)

# **Chapter one: Introduction**

## Summary

Chapter 1 describes….

## 1.1 Topic addressed in this project

## 1.2 Motivation

Ireland has a powerful history that has shaped not only its culture, but the culture of many other nations. This global recognition as pathed ways for many musicians to get the acknowledgement they may not have been exposed to otherwise.

## 1.3 Problem statement

Describe the technical problem needed to be solved in your project. Note that most projects solve both a more abstract, high-level problem and a specific, technical problem: your problem statement is the detailed technical problem (your motivation should cover the more abstract high-level problem).

## 1.4 Approach

Summarise how you addressed solving the problem.

Provide an overview of how you analysed the problem, how you designed a solution, and how you evaluated your solution. (e.g. use of models, simulation, prototypes, real-world experiments, cases studies, etc.). What important variables did you control, ignore, or measure in your evaluation.

## 1.5 Metrics

Describe how you are going to evaluate your work.

## 1.6 Project

List, and briefly describe your significant achievements in the project (probably 3-5 of these in a typical project). If you have come up with any contributions

# **Chapter two: Technical Background**

## Summary

The purpose of this chapter is to show your depth and breadth of reading and understanding of the problem domain

## 2.1 Topic material

(Research material, if used, from published journals and conference proceedings; less academic publications, if required by the project, from other sources) – for example, what other work researchers have done already in this area, what results they have produced, what work has been done in related areas, what software already exists to solve this or similar problems, etc.

## 2.2 Technical material

(From any source: including books, websites) – for example, how to write a web server, how to use specific Java features, how to use Ajax, how to use UML to validate your design, etc.

NB: Note that material relating to the motivation or non-technical background should **NOT** go here, but rather in the introduction

Table 2‑1 Table of interest: Aspect of your implementation

|  |  |
| --- | --- |
| **Column description 1** | **Column description 2** |
| A | Text 1 |
| B | Text 2 |
| C | Text 3 |

Table 2‑2 Data sources used in your implementation

|  |  |  |
| --- | --- | --- |
| **Column description 1** | **Column description 2** | **Column description 3** |
| X | 22 | 33 |
| Y | 33 | 456 |
| Z | 17 | 22 |

# **Chapter three: The Problem**

## Summary

The purpose of this chapter is to clearly explain the technical problem and/or identify the user requirements.

## 3.1 Project UML documentation

Provide any model(s) of the problem (e.g. equations, ERD’s, UML Use Cases & Scenarios, Activity Diagrams, etc.)



Figure 3‑1 UML class diagram overview for this project.

## 3.2 Problem analysis

Provide any analysis of the problem, leading to a greater understanding

There should be no decisions made in this chapter

# **Chapter four: The Solution**

## Summary

The purpose of this chapter is to clearly identify, discuss, and justify the decisions you make

## Depending on your type of project, you may not need to include all of these:

## 4.1 Analytical Work

E.g. Equations, etc. that describe your solution

## 4.2 Architectural Level

E.g. Implementation Diagrams

## 4.2 High Level

## E.g. Packages, Class Diagrams, etc.

## 4.2 Low Level

## E.g. Method specifications, Algorithms, etc.

## 4.2 Implementation

Discuss anything interesting here; put full source code in an appendix or attachment

# **Chapter five: Evaluation**

## Summary

Chapter 5 describes……..

## 5.1 Solution Verification

## E.g. use your equations to verify the correctness of your solution

## 5.2 Software Design Verification

How did you show that your design worked properly?

Using a model of your solution. E.g. use UML interaction diagrams to verify each scenario.

## 5.3 Software Verification

How did you demonstrate your software worked properly?

If you have not tested your software, then you cannot rely on your results. Clearly describe:

### 5.3.1 Your test approach (i.e. unit testing, sub-system testing, system testing)

### 5.3.2 Your tests (e.g. scenarios, test cases, test data, etc.)

### 5.3.3 Your test results

### 5.3.4 An interpretation of the results

## 5.4 Validation/Measurements

How did you measure how well your solution solved the problem.

### 5.4.1 Results

### 5.4.2 Explanation of Results

### 5.4.3 Analysis of Results

### 5.4.4 Comparison with previous solutions (if relevant)

**Chapter five: Conclusion**

**Summary**

Chapter 5 identifies and discuss the implications of your work.

**5.1 Contribution to the state-of-the-art**

If you made a contribution to the state-of-the-art, clearly identify it here.

**5.2 Results discussion**

Discuss whether your results are general, potentially generalizable, or specific to a particular case. Identify threats to the validity of your results (e.g. limitations, risks introduced by your approach, etc.)

**5.3 Project Approach**

Discuss your project approach

**5.3 Future Work**

Discuss future work, based on what you have done (and not done)

# **References**

Action Research : A definition . (2015). Retrieved February 25, 2016, from http://valenciacollege.edu/faculty/development/tla/actionResearch/ARP\_softchalk/ARP\_softchalk\_print.html

Hammersley, M. (1993). On the teacher as researcher. In M. Hammersley (Ed.), *Educational Research: Volume One: Current Issues* (pp. 211–231). The Open University.

Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Source: Administrative Science Quarterly Qualitative Methodology*, *24*(4), 602–611. Retrieved from http://www.jstor.org/stable/2392366

Kemmis, S. (1993). Action Research. In M. Hammersley (Ed.), *Educational Research: Volume One: Current Issues* (pp. 175–190). The Open University.

Kolb, D. (1984). *Experiential learning*. New Jersey: Prentice Hall.

McNiff, J., Lomax, P., & Whitehead, J. (2003). *You and Your Action Research Project* (2nd ed.). London & New York: London & New York.

**Appendices**

Include here all extra material, e.g. your source code, project management (optional) including: the task list, Gantt Chart diagrams (or equivalent), discussion of any significant deviations from plan, and how you managed them, discussion of what you would do differently if you repeated the project.

## Appendix 1 Schematic of the hardware associated with this project.

## Appendix 2 Code developed for this project.

## Appendix 3 UML Class, Use Case and sequence diagrams for this project.

|  |
| --- |
|  |
| Appendix 4 Screen shots of the project implementation |
|  |