**UNIVERSITY OF SOUTH AUSTRALIA**

School of Engineering



**Bachelor of Engineering (Electrical and Mechatronic)**

**Final Year Project**

**Real-time HDR Imaging**

Student: **Scott Rapson**

ID No: **110094036**

Supervisor: **Russell Brinkworth  
 Daniel Griffiths**

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Abstract

Robotic systems are often required to operate in areas with uncontrolled incident lighting. Uncontrolled and outdoor environments present imaging challenges for camera systems due to the wide range of luminances present, often causing issues with accurately perceiving scene detail for human driven or autonomous navigation. Several approaches have been developed, however this project seeks to develop a software based frame blending and artifact correction tool leveraging commodity CMOS based webcams and single board computing platforms. The proposed system aims to provide a more useable image in situations with uneven incident light through the expansion of the dynamic range with multiple imaging sensors and is the focus of this project.

Disclaimer

I hereby declare that this thesis is my own work and contains no material which has been accepted for the award of any degree or diploma from any tertiary institution. To the best of my knowledge and belief, this thesis contains no material previously written or published by another person, except where due reference is made in the text.

Signed:

Scott Rapson

12/11/2015

Acknowledgements

Enter your acknowledgements here.

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# Chapter One – ****Introduction****

## Introduction

You need to explain where the project came from, how it fits into the existing structure, outline any events or discussions that have taken place that preceded the project formation. The significance of the project is really an expansion of the project Aim and putting this into context in terms of the expected outcomes or improvements to be gained. If you intend to improve the performance of equipment or systems, then this chapter must outline in detail the current performance and how this has been measured. Once you have laid the foundations for the current system or problem, then you can move onto the next stage which is to plan the execution of your project.



Figure 1.1: Insert figure title

## Project Aim

This is where the aim of the project should be clearly stated.



Figure 1.2: Insert figure title

## Project Significance

What is the purpose of the project?

## Project Scope

This is where the project scope is clearly defined (what will be included in the project, and what will be excluded).

## Conclusion

Conclude with a summary for each chapter. Imagine if the person who this is ultimately intended for only has time to read the conclusion, what would you want them to learn from the chapter?

# Chapter Two – Literature Review

## Introduction

The purpose of the review is to demonstrate that you have adequately covered all aspects of the background to your Project and that you are not "re-inventing the wheel" in that you are using previous knowledge to good effect in your project.  
  
This requires that you demonstrate the following:  
  
\* Your ability to properly plan your search in a logical and useful way to maximize the useful information that you collect.  
\* To use the professional databases available through the library to find relevant and recent professional articles, papers, journals, patents and texts which may be relevant to your project.  
\* To search for Product, Equipment or Industry related information that may be relevant to your project. The Internet is a valuable resource for this.  
\* To filter and criticise the information you collect and to summarise the useful information that will be used in your thesis.  
\* Whilst the carrying out of a database search is required for this, the phrase "Literature Search" should be taken in the widest sense possible and is not restricted to doing a Library Search only. A literature search may also include any information, which may be essential or useful to your project. This may include production efficiency data to show improvements are possible. It may include statements from management or from meetings where the project was discussed or proposed. The project may include components, materials or software for which a product supplier search is necessary and, of course, any drawings that may exist.

## Conclusion

# Chapter Three – ****Theory (optional)****

## Introduction

It is rare for there to be a worthwhile engineering activity that does not have some theoretical underpinning. In some instances there will be enough theory that it is worthwhile expounding all of the mathematics in one place.

# Chapter Four – ****Method and Materials****

## Introduction

Design and research both have method. Outline the method and processes that ensure a useful outcome. How measurements or requirements were captured; were there controls in place to ensure the information captured was valid. Describe what equipment was used. Outline the manner of documentation.

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Figure 3.1: Insert figure title

## Conclusion

# Chapter Four – Results (title depends on how many chapters of results)

## Introduction

These chapters contain your many results. Ideally the chapters contain some discussion of the meaning of the results at the end, but should not refer to other results chapters (that is what the discussion section is for).

## Second heading

### Subheading

## Third heading

## Conclusion

# Chapter N-2 – Results (title depends on how many chapters of results)

## Introduction

These chapters contain your many results. Ideally the chapters contain some discussion of the meaning of the results at the end, but should not refer to other results chapters (that is what the discussion section is for).

## Second heading

### Subheading

## Third heading

## Conclusion

# Chapter N-1 – Discussion

## Introduction

The discussion is your opportunity to consider the implications and limitations of all of the results that you achieved. This is where interpretation of results beyond the obvious is done, and where you can project the significance of your outcomes. You can build an argument here for follow-on work, perhaps outlining how that work would be done.

## Second heading

### Subheading

## Third heading

## Conclusion

# Chapter N – Conclusion

## Introduction

In concluding your project thesis you must refer to the Aim of the project and compare your result with the original aim. Whilst the achievement of your aim is an important consideration, in real life, there may be good technical or commercial reasons if your project did not fulfill its original aim. You must address this in your concluding remarks showing clearly why the original aim was not met and justify the changes that were made. 

## Second heading

Table 7.1: Insert table title

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Figure 7.1: Insert figure title

### Subheading

## Third heading

## Conclusion

Finally you should summarize your achievements, highlighting any innovation or novelty.

# References

# Appendix A: ****Project Charter****

Here you insert your Preliminary Project Plan which will be referred to in the next appendix.

# Appendix B: ****Programmatic Review****

In this final mandatory section, you will consider how the project was planned to progress as compared to how it actually progressed. This will be done by comparing your project plan submitted in FYP1 and attached as Appendix A with how things finally transpired.  
  
Comprehensively review the Technical Risk, Finance, Schedule and Resources in your project, compared to your original plan created in FYP1.

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