

Development of a Mars Curiosity Rover Simulator

For the Cape Town Science Centre, from the perspective of space science and outreach



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Submitted to the Department of Electrical Engineering at the University of Cape Town
in partial fulfilment of the academic requirements for a Bachelor of Science degree in
Mechatronics

July 22, 2016

Declaration

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
2. I have used the IEEE convention for citation and referencing. Each contribution to, and quotation in, this report from the work(s) of other people has been attributed, and has been cited and referenced.
3. This report is my own work.
4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as their own work or part thereof.

Signature:.....
M. S. Tšoeu

Date:.....

Acknowledgments

Abstract

- Open the **Project Report Template.tex** file and carefully follow the comments (starting with %).
- Process the file with **pdflatex**, using other processors may need you to change some features such as graphics types.
- Note the files included in the **Project Report Template.tex** (with the .tex extension excluded). You can open these files separately and modify their contents or create new ones.
- Contact the latex manual for more features in your document such as equations, subfigures, footnotes, subscripts & superscripts, special characters etc.
- I recommend using the **kile** latex IDE or *TeXstudio*, as they are simple to use.

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Chapter 1

Introduction

1.1 Background to the study

A very brief background to your area of research. Start off with a general introduction to the area and then narrow it down to your focus area. Used to set the scene [?]. The section should highlight challenges in the study area to put your work in context [1].

1.2 Objectives of this study

1.2.1 Problems to be investigated

Description of the main problem(s) to be solved and/or hypothesis of your work. Questions to be answered in order to confirm the hypothesis or solve the problems are also articulated here.

1.2.2 Purpose of the study

Give the significance of investigating these problems. It must be obvious why you are doing this study and why it is relevant. Contributions of your work should also be given here.

1.3 Scope and Limitations

Scope indicates to the reader what has been and not been included in the study. Limitations tell the reader what factors influenced the study such as sample size, time etc. It is not a section for excuses as to why your project may or may not have worked.

1.4 Plan of development

This section summarizes the methods, tools, techniques and the order of doing things followed in order to accomplish your work. It also includes such planning tools as project Gantt chart, Critical path analysis and mind mapping.

1.5 Report Outline

Here you tell the reader how your report has been organised and what is included in each chapter. You should give a synopsis for each of your chapters here.

I recommend that you write this section last. You can then tailor it to your report.

Chapter 2

Literature Review

Once upon a time engineers and researchers believed... In this area of research, they used the following methods... [2]

Write this section first as it will take you the longest. I suggest you start writing this as soon as you have done your initial research at the beginning of your project. You can then return to it once you have completed your work to edit and adjust it.

A literature review forms the theoretical basis of your project. You need to read a large number of journal papers, sections in books, technical reports etc. relevant to your work at the start of project. This will give you a good idea of the field of research [3].

When writing your review start of with the general concepts and move to the more specific aspects explaining the necessary theory as you go. This section is NOT a copy and paste from others work or a rewrite-but-change-one-word section. I suggest you read all your material, and then put it down and write this section, referring back to the work only when you need to check something.

See your PCS textbook for more details on how to write a literature review [4].

If you include a figure or a table in your text please see the example in Fig. 2.1 as to how to caption it. Please make sure that all text in your figures is readable and that you reference your figures if they are from another source.

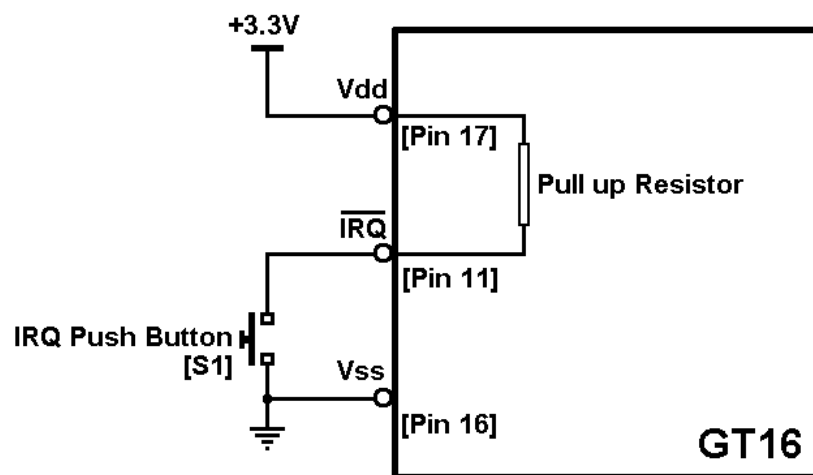


Figure 2.1: A block diagram illustrating the connections to the IRQ pin on the MCS08GT16A microcontroller (Please note that your headings should be short descriptions of what is in the diagram not simply the figure title)

Chapter 3

Methodology

This is what I did to test and confirm my hypothesis.

You may want to split this chapter into sub chapters depending on your design. I suggest you change the title to something more specific to your project.

This is where you describe your design process in detail, from component/device selection to actual design implementation, to how you tested your system. Remember detail is important in technical writing. Do not just write I used a computer give the computer specifications or the oscilloscopes part number. Describe the system in enough detail so that someone else can replicate your design as well as your testing methodology.

If you use or design code for your system, represent it as flow diagrams in text.

Chapter 4

Results

These are the results I found from my investigation.

Present your results in a suitable format using tables and graphs where necessary. Remember to refer to them in text and caption them properly.

4.1 Simulation Results

4.2 Experimental Results

Chapter 5

Discussion

Here is what the results mean and how they tie to existing literature...

Discuss the relevance of your results and how they fit into the theoretical work you described in your literature review.

Chapter 6

Conclusions

These are the conclusions from the investigation and how the investigation changes things in this field or contributes to current knowledge...

Draw suitable and intelligent conclusions from your results and subsequent discussion.

Chapter 7

Recommendations

Make sensible recommendations for further work.

Bibliography

- [1] E. Kamen and B. Heck, *Fundamentals of Signals and Systems Using the Web and MATLAB*. Prentice Hall, 2000.
- [2] M. Tsoeu and M. Inggs, “Fully Parallel Electrical Impedance Tomography Using Code Division Multiplexing,” *Biomedical Circuits and Systems, IEEE Transactions on*, vol. 10, no. 3, pp. 556–566, 2015.
- [3] A. Wilkinson, E. Randall, J. Cilliers, D. Durrett, T. Naidoo, and T. Long, “A 1000-measurement frames/second ERT data capture system with real-time visualization,” *Sensors Journal, IEEE*, vol. 5, no. 2, pp. 300–307, April 2005.
- [4] G. Teague, “Mass Flow Measurements of Multi-Phase Mixtures by Means of % Tomographic Techniques,” Ph.D. dissertation, 2001.

Appendix A

Additional Files and Schematics

Add any information here that you would like to have in your project but is not necessary in the main text. Remember to refer to it in the main text. Separate your appendices based on what they are for example. Equation derivations in Appendix A and code in Appendix B etc.

Appendix B

Addenda

B.1 Ethics Forms