LIT Masters Thesis Title

Subtitle of Thesis

Student Name

Department of the Built Environment

Limerick Institute of Technology

A thesis submitted for the degree of

Master of Science

Supervised by Dr. Super Visor

Submitted to the Limerick Institute of Technology, *DATE*

Declaration

The work presented in this thesis is the original work of the author, under the direction of formalsupervisor and due reference has been made, where necessary, to the work of others. No part of this thesis has been previously submitted to LIT or any other Institute.

_____   Date: _____

formalauthor,
Research Candidate

_____   Date: *December 15, 2020*

formalsupervisor,
Lead Supervisor

Dedication

I would like to dedicate this thesis to my loving parents ...

Acknowledgements

And I would like to acknowledge ...

Abstract

This is where you write your abstract ...

Contents

List of Figures

Chapter 1

Introduction

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Chapter 2

My First Chapter But Note The Numbering ...

2.1 First Paragraph

And now I begin my first chapter here ...

Here is an equation[1]:

$$CIF: \quad F_0^j(a) \;\; = \;\; \frac{1}{2\pi\iota} \oint_\gamma \frac{F_0^j(z)}{z-a} dz \tag{2.1}$$

2.2 Second Paragraph

and here I write more ...Knuth (1984)

2.2.1 Compiler

This template has been configured to work best with the pdfLatex compiler. You may have to change some stuff to make it work with XeLatex.

---

[1]the notation is explained in the nomenclature section :-)

2.2.2 Mendeley

Mendeley is not necessary for LaTeX. Mendeley is a standalone referencing management system that can be integrated to Microsoft Word or with LaTeX. The Mendeley application will manage your references in a manner similar to End-Note. The major advantage of Mendeley is that it will also manage your downloaded .pdf files. For more details of Mendeley and its functionality please go to www.mendeley.com

2.2.3 MiKTeX

The MiKTeX distribution contains the source files and executables for LaTeXto work. The MiKTex distribution comes is available from miktex.org Please note that a completed installation will consume approx 2.0 Gig of hard disk space. As the system is based on 'packages' you can elect to download and install packages as they are required. This will substantially reduce the hard disk requirement; however it can pose problems when internet connectivity is lost. My preferred option is to install the full distribution.

2.2.4 TeXstudio

In order to use LaTeXyou will need a text editor. There are numerous editors available for free download. To date I have found TeXstudio to be the most flexible. TeXstudio is available from https://www.texstudio.org/

2.2.5 Referencing and Citation

... and some more ...

Now I would like to cite the following: Lamport (1986) and Knuth (1984) and Rudin (1973).

Referencing or citation can be achieved in a number of formats. The standard is the \cite command which will display as above. Alternatives are \citet and \citep. The \citet command produces Kadison and Ringrose (1983) whereas the \citep command produces (Lamport, 1986). More information is available from the Natbib Reference Sheet by Ross Moore

2.2.6 Including Figures and Pictures

I would also like to include a picture ...

$M_\infty = 0.6$

a) Subsonic flow

Sonic line (M=1)

Shock wave

$M_\infty = 0.7$

b) Low transonic Mach number

$M_\infty = 0.85$

M > 1

M > 1

c) High transonic Mach number
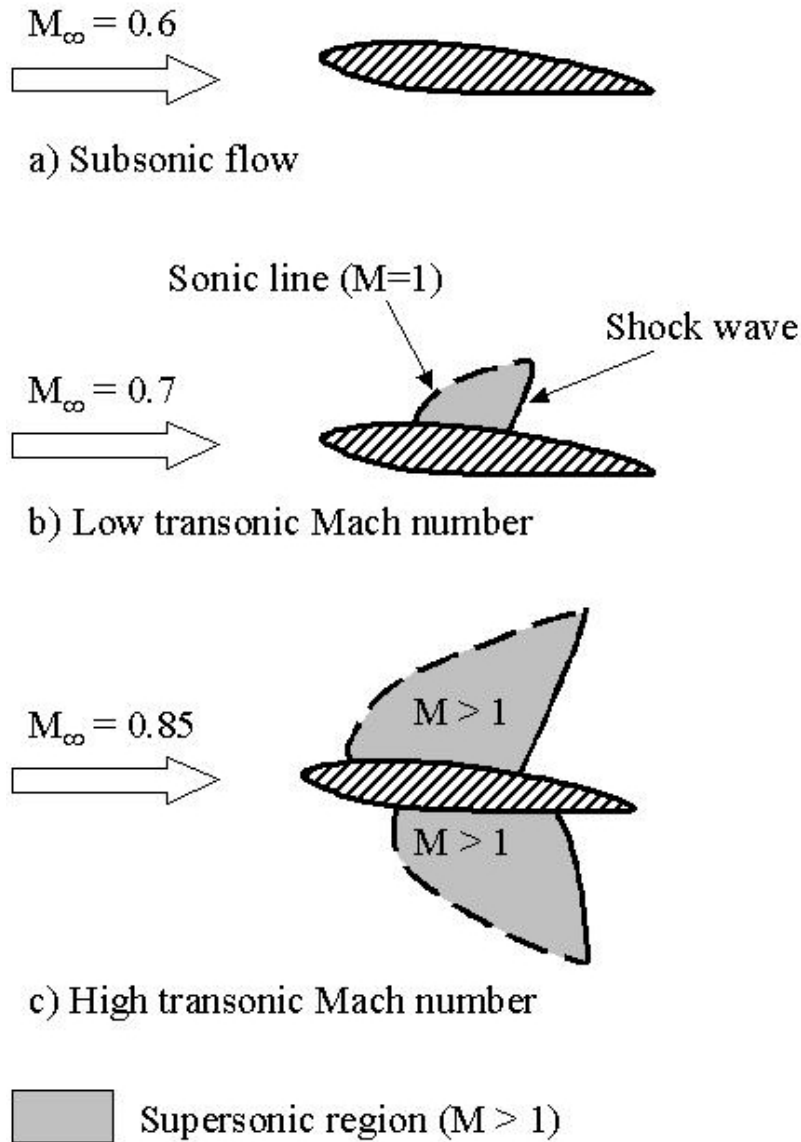
Supersonic region (M > 1)

Figure 2.1: Airfoil Picture

So as we have now labelled it we can reference it, like so (2.1) and it is on Page 10. And as we can see, it is a very nice picture and we can talk about it all we want and when we are tired we can move on to the next chapter ...

I would also like to add an extra bookmark in acroread like so ...

Chapter 3

My Second Chapter

3.1 Some Standard things that you may need

3.1.1 Tables

This subsection contains a few examples of tables such as table 3.1 and table 3.3. It also shows a use case for the tabularx environment shown in table 3.2.

Item	Entry
Item	Entry

Table 3.1: Table Name

Important stuff:	As stated
More Important Stuff:	As stated

Table 3.2: tab:Using TabularX

No.	Status Data
1	Some
2	Data
3	shown
4	here

Table 3.3: Status Data

3.1.2 Figures

Generally, images are pretty simple. Use .jpg or png and you will be fine. Just remember the captions. If you need to rotate an image, you will have to do slightly more work. All images here are licences under Creative Commons.

Figure 3.1: Colorful clouds and blue sky with water reflection of an island hosting trees at sunrise in Si Phan Don, Laos. Basile Morin, CC BY-SA 4.0

3.1.3 Vector Graphic Images

Vector graphics can be handled in two ways. Firstly, you can use eps files generated in another application, or secondly you can create the images on the fly using tikzpicture. A vector image is shown in figure 3.1.3.

3.2 Computer Code

3.2.1 No Code Highlighting

There are a few useful options for code also. If you just want a simple listing, without code highlighting, then 'verbatium' is a good option. You will have to convert tabs to 4 spaces.

```
def scope_test():
    def do_local():
        spam = "local spam"

    def do_nonlocal():
        nonlocal spam
        spam = "nonlocal spam"

    def do_global():
        global spam
        spam = "global spam"

    spam = "test spam"
    do_local()
    print("After local assignment:", spam)
    do_nonlocal()
    print("After nonlocal assignment:", spam)
    do_global()
    print("After global assignment:", spam)

    scope_test()
    print("In global scope:", spam)
```

3.2.2 Code Highlighting

The Listings package will add code highlighting for you, but will not add color. The example shown is for Python; this can be changed to other languages by

setting the language correctly.

```python
import numpy as np

def incmatrix(genl1, genl2):
    m = len(genl1)
    n = len(genl2)
    M = None #to become the incidence matrix
    VT = np.zeros((n*m,1), int)  #dummy variable

    #compute the bitwise xor matrix
    M1 = bitxormatrix(genl1)
    M2 = np.triu(bitxormatrix(genl2),1)

    for i in range(m-1):
        for j in range(i+1, m):
            [r,c] = np.where(M2 == M1[i,j])
            for k in range(len(r)):
                VT[(i)*n + r[k]] = 1;
                VT[(i)*n + c[k]] = 1;
                VT[(j)*n + r[k]] = 1;
                VT[(j)*n + c[k]] = 1;

            if M is None:
                M = np.copy(VT)
            else:
                M = np.concatenate((M, VT), 1)

            VT = np.zeros((n*m,1), int)

    return M
```

The lstlisting environment can be customised to show color syntax highlighting, but it takes a bit of work and is specific to the language. A good tutorial is

here https://denbeke.be/blog/programming/syntax-highlighting-in-latex/
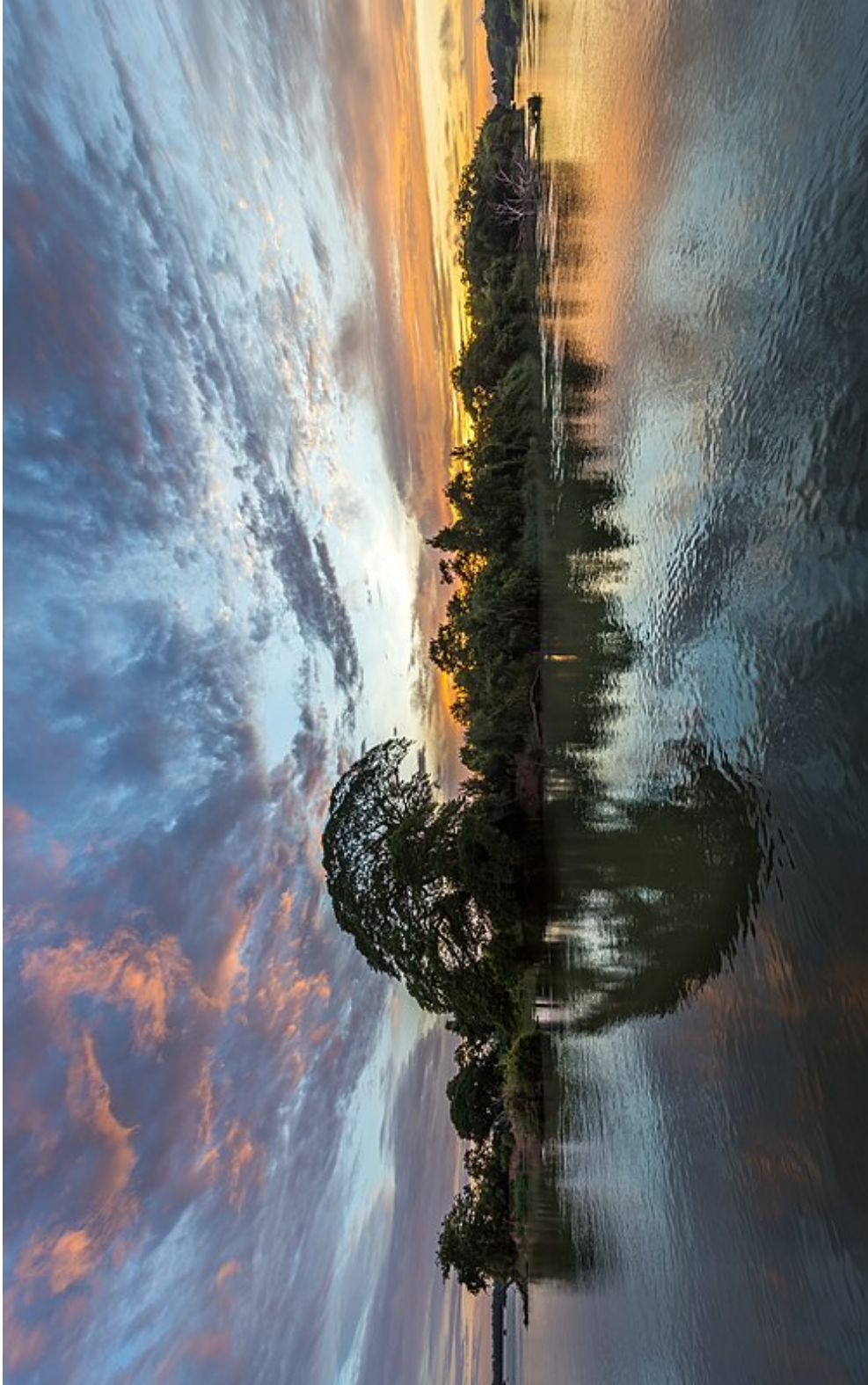
Figure 3.2: Sideways Image
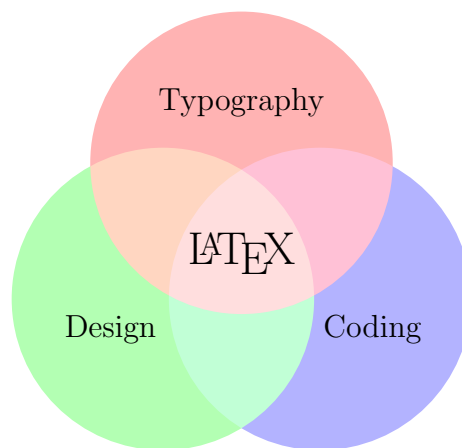
Figure 3.3: More Vector examples from: https://texample.net/tikz/examples/all/

Chapter 4

My Third Chapter

4.1 First Section of the Third Chapter

And now I begin my third chapter here ...

4.1.1 first subsection in the First Section

... and some more

4.1.2 second subsection in the First Section

... and some more ...

4.1.2.1 first subsub section in the second subsection

... and some more in the first subsub section otherwise it all looks the same doesn't it? well we can add some text to it ...

4.1.3 third subsection in the First Section

... and some more ...

4.1.3.1 first subsub section in the third subsection

... and some more in the first subsub section otherwise it all looks the same doesn't it? well we can add some text to it and some more and some more and some more and some more and some more and some more and some more ...

4.1.3.2 second subsub section in the third subsection

... and some more in the first subsub section otherwise it all looks the same doesn't it? well we can add some text to it ...

4.2 Second Section of the Third Chapter

and here I write more ...

Chapter 5

My Conclusions ...

Here I put my conclusions ...

References

Kadison, R. V. and Ringrose, J. R. (1983), *Fundamentals of the Theory of Operator Algebras, Part I*, Academic Press, New York. 9

Knuth, D. E. (1984), *The T$_E$Xbook*, Addison-Wesley. 8, 9

Lamport, L. (1986), *L^{A}T$_E$X: A Document Preparation System*, Addison-Wesley. 9

Rudin, W. (1973), *Functional Analysis*, McGraw-Hill, New York. 9

Appendix A

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Appendix B

Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every "superstar," every "supreme leader," every saint and sinner in the history of our species lived there–on a mote of dust suspended in a sunbeam.

Let's light this fire one more time, Mike, and witness this great nation at its best.

It's just mind-blowingly awesome. I apologize, and I wish I was more articulate, but it's hard to be articulate when your mind's blown, but in a very good way.

I am a stranger. I come in peace. Take me to your leader and there will be a massive reward for you in eternity.

We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.

That's one small step for [a] man; one giant leap for mankind.

The size and age of the Cosmos are beyond ordinary human understanding. Lost somewhere between immensity and eternity is our tiny planetary home. In

a cosmic perspective, most human concerns seem insignificant, even petty. And yet our species is young and curious and brave and shows much promise. In the last few millennia we have made the most astonishing and unexpected discoveries about the Cosmos and our place within it, explorations that are exhilarating to consider. They remind us that humans have evolved to wonder, that understanding is a joy, that knowledge is prerequisite to survival. I believe our future depends powerfully on how well we understand this Cosmos in which we float like a mote of dust in the morning sky.

The Earth is a very small stage in a vast cosmic arena. Think of the rivers of blood spilled by all those generals and emperors so that, in glory and triumph, they could become the momentary masters of a fraction of a dot. Think of the endless cruelties visited by the inhabitants of one corner of this pixel on the scarcely distinguishable inhabitants of some other corner, how frequent their misunderstandings, how eager they are to kill one another, how fervent their hatreds.

Houston, that may have seemed like a very long final phase. The autotargeting was taking us right into a ... crater, with a large number of big boulders and rocks ... and it required ... flying manually over the rock field to find a reasonably good area.

First, I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish.

I saw for the first time the earth's shape. I could easily see the shores of continents, islands, great rivers, folds of the terrain, large bodies of water. The horizon is dark blue, smoothly turning to black. . . the feelings which filled me I can express with one word - joy.

A good rule for rocket experimenters to follow is this: always assume that it will explode.

It has been said that astronomy is a humbling and character-building experience. There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility

to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known.

The surface is fine and powdery. I can kick it up loosely with my toe. It does adhere in fine layers, like powdered charcoal, to the sole and sides of my boots. I only go in a small fraction of an inch, maybe an eighth of an inch, but I can see the footprints of my boots and the treads in the fine, sandy particles. There seems to be no difficult in moving around, as we suspected.

From this day forward, Flight Control will be known by two words: 'Tough' and 'Competent.' Tough means we are forever accountable for what we do or what we fail to do. We will never again compromise our responsibilities. Every time we walk into Mission Control we will know what we stand for. Competent means we will never take anything for granted. We will never be found short in our knowledge and in our skills. Mission Control will be perfect. When you leave this meeting today you will go to your office and the first thing you will do there is to write 'Tough and Competent' on your blackboards. It will never be erased. Each day when you enter the room these words will remind you of the price paid by Grissom, White, and Chaffee. These words are the price of admission to the ranks of Mission Control.

The view of the Earth from the Moon fascinated me, small disk, 240,000 miles away. It was hard to think that that little thing held so many problems, so many frustrations. Raging nationalistic interests, famines, wars, pestilence don't show from that distance.

The Earth is the only world known so far to harbor life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment the Earth is where we make our stand.

Our posturings, our imagined self-importance, the delusion that we have some privileged position in the Universe, are challenged by this point of pale light. Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity, in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves.

The vehicle explodes, literally explodes, off the pad. The simulator shakes you a little bit, but the actual liftoff shakes your entire body and soul.