

**A data reduction algorithm incorporating a low power  
continuous wavelet transform for use in wearable  
electroencephalography systems**

A thesis submitted to the University of Manchester for the degree of  
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# Abstract

Abstract goes here

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# Acknowledgements

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# Chapter 1

## Introduction

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# Chapter 2

## Literature review

### 2.1 Introduction

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### 2.2 Example display items

This is an example of providing a cross-reference to Chapter 3. Similarly, this is an example cross-reference to a sub-section, Section 3.2.

This is an example of adding references [1], [2], [3]. If you want the author name, or similar, you can use: A. J. Casson, E. Luna, and E. Rodriguez-Villegas in 2009 introduced a really good idea. (This is for when you primarily use numbered citations, but occasionally need an author's name. If using author names as the reference everywhere, change `style=ieee` in the biblatex setup above to whatever reference style you want, and then just use the `cite` command.)

For adding *emphasis* use the `emph` command or underscores such as *emphasis*.

An example table is given in Table 2.1. Note that the headings are inside a `table.header` environment to tell screen readers which cells are headers and which cells have the table content. Also, at the moment the template only adds the top horizontal line to the table. The others are added by hand in the table definition below. Ideally the template should detect the end of the

header, and the end of the table, and add these horizontal lines automatically, but this doesn't work yet.

**Table 2.1.** Probe results for design A.

Participant	Number (%)		Duration (%)	
	Prime dresses	Non-prime dresses	Prime dresses	Non-prime dresses
1	33.33	33.91	20.83	18.42
2	13.04	17.50	04.93	07.62
3	22.73	20.10	13.00	08.20
4	31.34	21.88	10.57	11.09
5	08.47	19.32	03.04	09.73
Mean	16.4	16.5	07.8	07.5
Standard deviation	09.7	06.6	05.4	03.3

This is an example equation in text  $2 \sin \omega t$ . (2.1) is an example of a displayed equation.

$$a^2 + b^2 = c^2 \quad (2.1)$$

Note that numbers are displayed differently in the text depending on how they are entered. Compare for example 123456 vs. 123456. Entering numbers directly, such as 1955, should be used for *text mode* numbers. That is, those representing text (dates, page numbers, and similar). Numbers representing maths, or variables or similar, should be entered inside \$ \$ so they are typeset in the same way as they appear in an equation. (This requires a bit of discipline, but helps ensure consistent use of number styles throughout.)

This is an example of a quote in text “*The electroencephalogram (EEG) is a classic non-invasive method for measuring a person’s brainwaves*” [3]. Below is an example of a displayed quote.

“*Electrodes are placed on the scalp to detect the microvolt-sized signals that result from synchronized neuronal activity within the brain.*” [3]

Fig. 2.1 is an example figure. Sub-figures are not currently supported by the template. There is an example commented out below which uses the subpar package, however the way subpar re-labels the captions is incompatible with how they’ve been re-labelled already in the template. The commented out example gets relatively close to being correct, but isn’t perfect. This will need to be re-visited in a future release.

**Fig. 2.1.** Example figure. Full caption goes here. Often a short caption in [] is used as well as the main caption to keep the list of figures tidy; it gets messy if there are long captions going over more than one line.

An example code listing is given below. Code in the body of the text can be included as for or while or main. This is just using the built in Typst functionality which is fairly limited. Could look at <https://typst.app/universe/package/codly/> or similar to give more functionality such as line numbers, ability to link to a piece of code, and similar.

```
import numpy as np

def my_filter(in, f_obj):
    y = filter(f_obj, in)

    return y
```

## 2.3 Summary

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# Chapter 3

## Really good work

### 3.1 Introduction

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### 3.2 Content

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#### 3.2.1 Introduction

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#### 3.2.2 Detail

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### **3.2.3 More detail**

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### **3.2.4 Summary**

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## **3.3 Summary**

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# Chapter 4

## Conclusions

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# References

- [1] A. J. Casson, E. Luna, and E. Rodriguez-Villegas, “Performance metrics for the accurate characterisation of interictal spike detection algorithms,” *J. Neurosci. Meth.*, vol. 177, no. 2, pp. 479–487, 2009.
- [2] A. J. Casson and E. Rodriguez-Villegas, “Toward online data reduction for portable electroencephalography systems in epilepsy,” *IEEE T. Biomed. Eng.*, vol. 56, no. 12, pp. 2816–2825, 2009.
- [3] A. J. Casson, D. C. Yates, S. J. Smith, J. S. Duncan, and E. Rodriguez-Villegas, “Wearable electroencephalography,” *IEEE Eng. Biol. Med. Mag.*, vol. 29, no. 3, pp. 44–56, 2010.

# Appendices

# Appendix A

## First Appendix

### A.1 Section in Appendix



The University of Manchester

**Fig. A.1.** Example figure in Appendix.

# **Appendix B**

## **Second Appendix**

### **B.1 Section in Appendix**