

# COMSM0111

The run in

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<http://carlhenrik.com>

- Writing
- Submission
- Marking
- Tools

# Writing

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# Whats the purpose of a project?

- 3.5 years at UoB
  - about 27 units
  - two group projects
- The purpose of these units was to
  - teach you some tools
  - teach you to learn
- *Showing this is the purpose of the individual project*



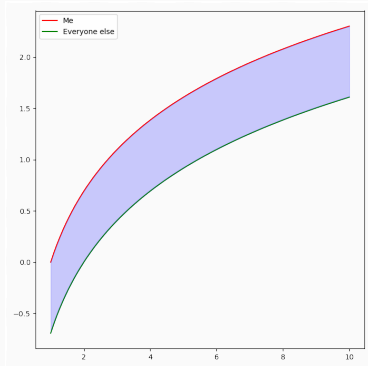
- have you learnt anything from the project?
- is there a reference which states **exactly everything** that you have learnt?
- does **exactly everything** that you have done to learn this exists?

# Whats the purpose of the dissertation?



# Results

Method	Accuracy
Method A	83%
Method B	75%
Method C	84%
ME	97%



- What is the story I want to tell?
- How can I find a way through the related work that supports my story?
- Idea of structure
  1. what is good with this approach (its related to what you do so there has to be something)
  2. what is the issue with this approach (otherwise you wouldn't do this work)

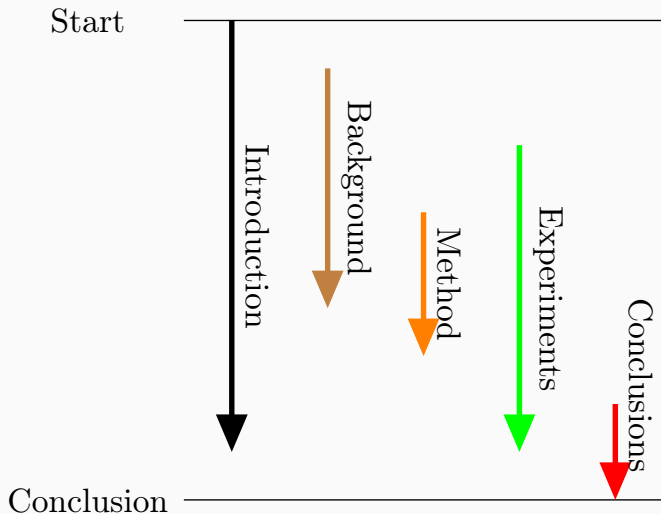


*In its original form DTW only aligns two sequences but there have been several proposed extensions that allows it to process multiple sequences at once, most notably Procrustes dynamic time warping (PDTW), Procrustes derivative dynamic time warping (PDDTW), and Iterative Motion Warping (IMW)[1],[2],[3]. All of these methods are applied directly in the observation space which is a limitation when the data contains a significant amount of noise.*

*The main algorithms that address this limitation are Canonical Time Warping (CTW) and Generalized Time Warping (GTW)[4],[5]. Both of these approaches perform feature extraction and find a subspace that maximises the linear correlation of data samples. Similarly to our approach, GTW is parametrised using monotonic warping functions. However, in all these methods the spatial alignment and time warping are coupled.*

*Another extension, called Generalized Canonical Time Warping (GCTW) combines CCA with DTW to simultaneously align multiple sequences of multi-modal data[6]. GCTW relies on additional heuristic energy terms and on coarse-to-fine optimisation to get the energy method to converge to a good local minimum.*

# Structure



**Project A** *Exponential family variational bound on Latent Process Decomposition*

- Setting: no one knows what this is
- Methodology: algebra and calculus
- Results: yes/no

**Project B** *Can a machine learn musical style?*

- Setting: everyone listens to music
- Methodology: psychology, applied machine learning, data etc.
- Results: music to be interpreted

# Whats the purpose of the dissertation?



- DSoft submit thesis as PDF
- DAux submit all other work, code, videos, etc.
- DHard this is where you will get your mark

## Marking

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- Challenges and Contribution
- Depth and Rigour
- Design and Implementation
- Testing and Evaluation
- Organisation and Communication

# The Topics

Topic	Dissertations
Computer Architecture	4
Computer Graphics	3
Computer Vision	14
Crypto	6
Human Computer Interaction	3
Machine Learning	25
Neuroscience	1
Programming Languages	1

# The Panel

Staff	Topic
Aisling O'Kane	Human Computer Interaction
Andrew Calway	Computer Vision
Carl Henrik Ek	Machine Learning
Cian O'Donnel	Neuroscience
David May	Computer Architecture
Ivan Palomares	Data Science & Decision Theory
Luis Vaquero	Databases
Martijn Stam	Cryptography
Meng Wang	Programming Languages
Neill Campbell	Computer Vision
Oliver Ray	Logic
Song Liu	Machine Learning

*"The marking panel are not necessarily experts in your topic, meaning the clarity and quality of your presentation is therefore at least as important as the technical challenge or quality of your work. Put another way, if the reader cannot understand your contribution it does not matter how good it is: they will be unable to comprehend the level of quality or the associated value."*

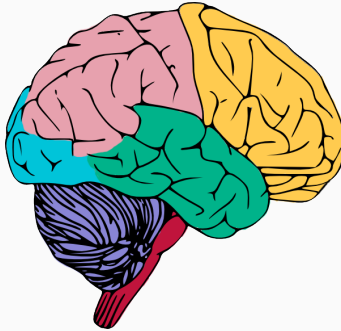


## Carl marking HCI

Whatever you write you cannot make me understand why I would want a 3D keyboard, where is the proof, this is at best anecdotal ..

You can do this with M-x threedee C-c-a k  $\Rightarrow$  low mark

# When it goes wrong B



## Carl marking neuroscience

this is fascinating, a beautiful written story that captivates the reader, who could have thought mice respond to caffeine so dissimilar to humans, does it mean its all our society?

Great stuff  $\Rightarrow$  high mark

# How to reach a balance

- External marker
  - allows us to balance experts with projects better
  - allows more time per project
  - (hopefully) not biased
- Supervisor mark
  - failsafe
  - (hopefully) expert that understands the meaning of the project
  - (most likely) biased

**Project A** *Exponential family variational bound on Latent Process Decomposition*

- Setting: no one knows what this is
- Methodology: algebra and calculus
- Results: yes/no
- **Scenario: no one can relate nor have opinion**

**Project B** *Can a machine learn musical style?*

- Setting: everyone listens to music
- Methodology: psychology, applied machine learning, data etc.
- Results: music to be interpreted
- **Scenario: everyone can relate and have opinion**



## Tools

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- [pandoc](#), [org-babel](#), [pweave](#) (literate programming tools)

- [latexmk](#)

```
latexmk -pvc
```

- [biblatex](#)

- flexible citations `\footcite{}`, `\citeauthor{}`
- avoid citing arXiv if published version exists
- clean up the references
- if citing websites include date visited

- PGF - Portable Graphics Format
- Tikz - Tikz Ist Kein Zeichenprogramm
- Interpreter in T<sub>E</sub>X



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<sup>1</sup><http://www.texample.net/tikz/>

```
import numpy as np
import matplotlib.pyplot as plt
from matplotlib2tikz import save as tikz_save

t = np.linspace(0,np.pi*2,100)
y = np.sin(t)
plt.plot(t,y)

tikz_save('apa.tex')
```

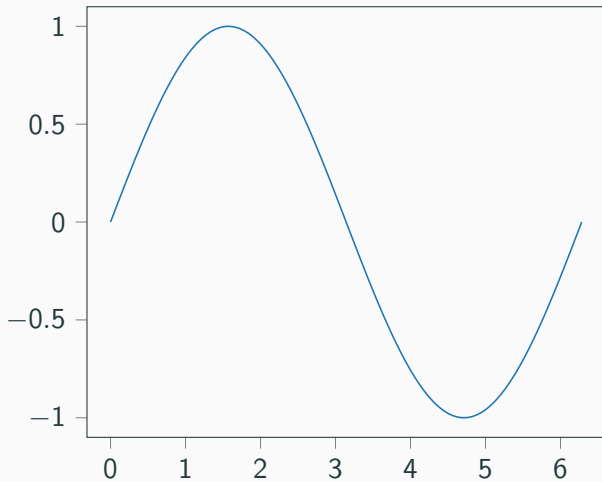
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<sup>2</sup><https://pypi.python.org/pypi/matplotlib2tikz>

```
\begin{tikzpicture}

\definecolor{color0}{rgb}{0.12156862745098,
    0.466666666666667,0.705882352941177}

\begin{axis}[
xmin=-0.314159265358979, xmax=6.59734457253857,
ymin=-1.09986154044126, ymax=1.09986154044126,
tick align=outside,
tick pos=left,
x grid style={white!69.01960784313725!black},
y grid style={white!69.01960784313725!black}
]
\addplot [semithick, color0, forget plot]
```



eof

## References

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In *SIAM International Conference on Data Mining*, 2001.



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In *Advances in Neural Information Processing Systems (NIPS)*,  
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*In International Conference on Computer Vision and Pattern Recognition (CVPR), 2012.*



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