

# Thesis Title



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This dissertation is submitted for the degree of  
*Doctor of Engineering*

Research Group

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**Date**

September, 2021.

*I would like to dedicate this thesis to ...*

## Acknowledgements

I would firstly like to thank ...

Thanks to ...

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Finally, I want to thank ....

# Abstract

Your abstract info ....

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# Notation

## Mathematical notation

### Generalities

$V$	number of views
$N_v$	Number of objects (observations) in the $v$ th view
$D_v$	dimensionality of the $v$ -th view
$L_v$	Dimensionality of the observed features in the $v$ th view
$K$	Dimensionality of the latent feature vector
$J$	Number of correspondences (latent vectors) to which objects are assigned

### Operators

$\mathbb{E}[\cdot]$	expected value
$\text{tr}(\cdot)$	trace of a matrix

### Functions

$k(\cdot, \cdot)$	covariance function for a Gaussian process of $\mathbf{x}_{vn}$
$f_d(t)$	$d$ -th output or response function evaluated at $t$
$\phi(\cdot)$	nonlinear mapping function

## Vectors and matrices

$\mathbf{x}_{vn}$	Observation of the $n$ th object in the $v$ th view, $\mathbf{x}_{vn} \in \mathbb{R}^{D_v}$
$\phi(\mathbf{x}_{vn})$	Observation of the $n$ th feature object in the $v$ th view, $\phi(\mathbf{x}_{vn}) \in \mathbb{R}^{L_d}$
$\zeta_j$	Latent feature vector for the $j$ th correspondence, $\zeta_j \in \mathbb{R}^K$
$\mathbf{B}_v$	Projection matrix for the $v$ th view, $\mathbf{B}_v \in \mathbb{R}^{L_d \times K}$
$\theta_j$	Mixture weight for the $j$ th cluster, $\theta_j \geq 0$ , $\sum_{j=1}^{\infty} \theta_j = 1$
$\mathbf{K}_v$	covariance matrix with entries $k(\mathbf{x}_{vn}, \mathbf{x}'_{vn})$
$\mathbf{f}_d$	$f_d(t)$ evaluated at $\mathbf{f}_d = [f_d(t_{d,1}), \dots, f_d(t_{d,N_d})]^\top$
$\mathbf{f}$	vectors $\{\mathbf{f}_d\}_{d=1}^D$ , stacked in one column vector
$\mathbf{I}_N$	identity matrix of size $N$

## Abbreviations

LVM	Latent Variable Model
UCM	Unsupervised Clustering Matching
GP	Gaussian Process
GP-LVM	Gaussian Process Latent Variable Model
iGMM	Infinite Gaussian Mixture Model
DP	Dirichlet Process
EM	Expectation Maximization

# Chapter 1

## Introduction

Your Intro ....

### 1.1 Aims

#### 1.1.1 General aim

XXXXXXXXXXXXx

#### 1.1.2 Specific aims

1. XXXXX
2. XXXXX
3. XXXXX

### 1.2 Outline of the Thesis

From the *XXXXXXX perspective*, we introduced XXXXXXXXXXXXXXXX.

From the *XXXXXXX perspective*, our contribution was based on XXXXXXXX.  
In detail, the rest of the thesis is structured as follows:

- Chapter [2](#) XXXXXXXXXXXX.
- Chapter XXXXXXXXXXXXXXXXXXXXxx

- Chapter 3 summarizes the key contributions of the thesis and discusses ideas for future work.

## 1.3 Associated Publications and Software

The work presented in Chapter XXXXXXXX is based on two published papers. First paper XXXXXXXXX states the motivation of problem. Then, paper XXXXXXXX extend ...

# Chapter 2

## Thesis Theme

This chapter describes how to tackle XXXXXXXXXXXXXXXXXXXX.

The original contribution of this chapter is to offer a review showing the implications of different XXXXXXXXXXXXXXXX problems, and ...

### 2.1 Theme 1

As in (?)...

### 2.2 Theme 2

...

# Chapter 3

## Conclusions and Future Work

This thesis considered XXXXXXXXXXXX ....

This chapter summarizes the contributions and research work done in the thesis, besides some future research lines are presented.

### 3.1 Conclusions

- Chapter 2 provided a unifying view of existing approximation to the correspondence problem. A special focus is given for a set of correspondence approaches in the context of shape analysis.
- Chapter XXXXXXXXXXXX.

### 3.2 Future Work

Some interesting paths for future work involve approaches to solving current limitations of the presented methods and further extensions of the developed methodologies. In particular, XXXXXXXXXXXX.

The main ideas for the XXXXXXXXXXXX problem are summarized

**Idea1:** XXXXXXXXXXXX.

**Idea1:** XXXXXXXXXXXX.

# Appendix A

## Performance metrics

### A.1 Metric 1

XXXXXXXXXXXXXXXXxxxxxxx



# Appendix B

## Appendix for Chapter 1

XXXXXXXXXXXXXX

# Appendix C

## Appendix for Chapter 2

# Appendix D

## Publications

### D.1 Published Papers

- Kevin P. Murphy. *Machine learning : a probabilistic perspective*. MIT Press, Cambridge, Mass. [u.a.], 2013. ISBN 9780262018029 0262018020. URL [https://www.amazon.com/Machine-Learning-Probabilistic-Perspective-Computation/dp/0262018020/ref=sr\\_1\\_2?ie=UTF8&qid=1336857747&sr=8-2](https://www.amazon.com/Machine-Learning-Probabilistic-Perspective-Computation/dp/0262018020/ref=sr_1_2?ie=UTF8&qid=1336857747&sr=8-2)
- M. Cargill and P. O'Connor. *Writing Scientific Research Articles: Strategy and Steps*. Writing Scientific Research Articles: Strategy and Steps. Wiley, 2009. ISBN 9781405193351. URL [https://books.google.com.co/books?id=4BQiUf7n\\_lwC](https://books.google.com.co/books?id=4BQiUf7n_lwC)

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