SOME CLEVER TITLE

by

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LAST NAME, FIRST NAME (Ph.D., Applied Mathematics)

SOME CLEVER TITLE

Thesis directed by Assistant Professor Dr. One One

ABSTRACT

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ABBREVIATIONS AND NOTATION

.1 Abbreviations

.2 Mathematical Notation

.2.1 General Notation

x	italicized, Roman or Greek letter, denotes scalar values
$\boldsymbol{x}$	italicized, bold, lowercase Roman or Greek letter, denotes a column vector
$\boldsymbol{X}$	italicized, bold, uppercase Roman or Greek letter, denotes a matrix
$\boldsymbol{X}_{ij}$	denotes the component of matrix $\boldsymbol{X}$ occupying row i and column j
$x \in (a, b)$	the value x is within the interval such that $a < x < b$
$x \in (a, b]$	the value x is within the interval such that $a < x \leq b$
$x \in [a, b)$	the value x is within the interval such that $a \leq x < b$
$x \in [a, b]$	the value x is within the interval such that $a \leq x \leq b$
$1_A(x)$	the indicator function, $1_A(x) = \begin{cases} 1 & x \in A \\ 0 & x \notin A \end{cases}$.
$\mathbf{1}_n$	an column vector of n 1s
$\boldsymbol{I}$	the identity matrix
$\boldsymbol{I}_n$	the $n \times n$ identity matrix
$\boldsymbol{X}^{-1}$	the inverse matrix, i.e., the operator satisfying $\boldsymbol{X}^{-1}\boldsymbol{X} = \boldsymbol{X}\boldsymbol{X}^{-1} = \boldsymbol{I}$.
$\boldsymbol{X}^{\top T}$	transpose, i.e. the operator satisfying $X_{i,j} = X_{j,i}\ \forall\ i, j \in \mathbb{N}$
$\otimes$	Kronecker product

$\odot$	element-wise multiplication

.2.2 Sets

$\{x, y, z, \ldots\}$	the set comprising the elements of x, y, z, ...
$\{x, y, z\} \setminus x$	the set comprising the elements of y and z[1]
$\{x_i\}_{i=1}^{n}$	the set comprising the elements of $x_1, x_2, x_3, \ldots, x_n$
$\mathbb{R}$	set of real numbers
$\mathbb{N}$	set of natural numbers
$\boldsymbol{x} \in \mathbb{R}^n$	$\boldsymbol{x}$ is a vector with n elements, all of which are real numbers

.2.3 Statistical Distributions

$\mathcal{N}\left(\mu, \sigma^2\right)$	the uni-variable Gaussian distribution with mean μ and variance σ^2
$\mathcal{N}\left(\boldsymbol{\mu}, \boldsymbol{\Sigma}\right)$	the multi-variable Gaussian distribution with mean vector $\boldsymbol{\mu}$ and variance-covariance matrix $\boldsymbol{\Sigma}$
$\phi(x)$	the standard Gaussian density function

.2.4 Specialized Notation

This notation refers to values defined explicitly in the context of this thesis.

- $\mathcal{M}$ a model that takes input parameters to an (observable) state space
- u an observable state space from which data is to be collected
- λ a (model) parameter into model $\mathcal{M}$
- $\boldsymbol{o}$ a Parameter-to-Observables (PtO) map, also denoted $\boldsymbol{o}(u(\lambda))$ or $\boldsymbol{o}(\lambda)$, each component of which is a functional $\boldsymbol{o}_i : u(\lambda) \to \mathbb{R}$ on the observable state[2]

[1] In other words, the backslash removes an element (or a subset) from the original set.

[2] This map represents performing an individual experiment, which may consist of one or more observations (either in space or time). Arranging observational data into a vector defines the map.

- Q a Quantity of Interest (QoI) map, also denoted $Q(\lambda)$, which acts on observable data to transform the data into a scalar or vector quantity[3]

- $\boldsymbol{d}$ data representing an individual output of a (possibly vector-valued) QoI map for a particular parameter λ, i.e. $Q(\lambda) = \boldsymbol{d}$

[TK - add Measure-Theory notation into this section, based on what you have in your newcommands.tex file]

The form and content of this abstract are approved. I recommend its publication.

Approved: Dr. One One

[3]For example, it may be the average of measurements encompassed in $\boldsymbol{o}$. Technically, this map encompasses the following set of compositions: $Q(\boldsymbol{o}(u(\lambda)))$.

DEDICATION

ACKNOWLEDGEMENTS

Thanks.

TABLE OF CONTENTS

LIST OF TABLES

TABLE

LIST OF FIGURES

FIGURE

CHAPTER I

FIRST CHAPTER

I.1 First Section

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I.2 Second Section

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I.2.1 A Subsection

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CHAPTER II
SECOND CHAPTER

II.1 First Section

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