

Audun Sørheim

## **Misinformation...**

Any undertitle is written here

Master's thesis in Physics and Mathematics

Supervisor: Astrid Silvia de Wijn

Co-supervisor: Raffaella Cabriolu

January 2026

Norwegian University of Science and Technology

Faculty of Natural Sciences

Department of Physics





## ABSTRACT

Write an abstract/summary of your thesis, and state your main findings here

A summary should be included in both English and any second language, if this is applicable, regardless if the thesis is written in English or in your preferred language. These should be on separate pages, the English version first.

# PREFACE

Write the preface of your thesis here.

You may include acknowledgements and thanks as part of your preface on this page, or you may add it as a new chapter after the preface.

# CONTENTS

<b>Abstract</b>	<b>i</b>
<b>Preface</b>	<b>ii</b>
<b>Contents</b>	<b>iv</b>
<b>List of Figures</b>	<b>iv</b>
<b>List of Tables</b>	<b>v</b>
<b>Abbreviations</b>	<b>vii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Motivation . . . . .	1
1.2 Project description . . . . .	2
1.2.1 Stakeholders . . . . .	2
<b>2 Sociology</b>	<b>3</b>
2.1 Sociology . . . . .	3
2.2 Equations . . . . .	3
2.3 Tables and footnotes . . . . .	4
2.4 A single figure . . . . .	4
2.5 Citations . . . . .	5
<b>3 Graph Theory</b>	<b>7</b>
3.1 Graphs . . . . .	7
<b>4 Distributed Hypothesis Testing Model</b>	<b>9</b>
4.1 Model theory . . . . .	9
<b>5 Methods</b>	<b>11</b>
5.1 Creating graphs . . . . .	11
5.1.1 Subsection one . . . . .	11
5.1.2 Subsection Two . . . . .	11
5.2 Section two . . . . .	11
<b>6 Results</b>	<b>13</b>
6.1 More figures . . . . .	13

<b>7</b>	<b>Discussion</b>	<b>15</b>
7.1	Future work . . . . .	15
<b>8</b>	<b>Conclusions</b>	<b>17</b>
	<b>References</b>	<b>19</b>
	<b>Appendices:</b>	<b>21</b>
	<b>A - Github repository</b>	<b>22</b>
	<b>B - Sidenote statistics</b>	<b>23</b>

## LIST OF FIGURES

## LIST OF TABLES

2.3.1 Dynamic feature statistics with outliers . . . . .	4
2.3.2 Selected time ranges for all data . . . . .	5
B.1 Statistics on something . . . . .	23
B.2 Statistics on something else . . . . .	24

## ABBREVIATIONS

List of all abbreviations in alphabetic order:

- **BA**: Barabási-Albert
- **CD**: Cognitive Dissonance
- **DHT**: Distributed Hypothesis Model
- **ER**: Erdős-Rényi
- **NTNU**: Norwegian University of Science and Technology



## INTRODUCTION

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

### 1.1 Motivation

Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia consequuntur magni dolores eos qui ratione voluptatem sequi nesciunt. Neque porro quisquam est, qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit, sed quia non numquam eius modi tempora incidunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim ad minima veniam, quis nostrum exercitationem ullam corporis suscipit laboriosam, nisi ut aliquid ex ea commodi consequatur? Quis autem vel eum iure reprehenderit qui in ea voluptate velit esse quam nihil molestiae consequatur, vel illum qui dolorem eum fugiat quo voluptas nulla pariatur?

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas molestias excepturi sint occaecati cupiditate non provident, similique sunt in culpa qui officia deserunt mollitia animi, id est laborum et dolorum fuga. Et harum quidem rerum facilis est et expedita distinctio. Nam libero tempore, cum soluta nobis est eligendi optio cumque nihil impedit quo minus id quod maxime placeat facere possimus, omnis voluptas assumenda est, omnis dolor repellendus. Temporibus autem quibusdam et aut officiis debitis aut rerum necessitatibus saepe eveniet ut et voluptates repudiandae sint et molestiae non recusandae. Itaque earum rerum hic tenetur a sapiente delectus, ut aut reiciendis voluptatibus maiores alias consequatur aut perferendis doloribus asperiores repellat.

## 1.2 Project description

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

### 1.2.1 Stakeholders

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

## SOCIOLOGY

This chapter will contain all the relevant theory on humans, humans behavior and more which help drive the dynamics of the DHT model. This chapter is heavily inspired by my project thesis "Beliefs and the Propagation of Misinformation in Social Networks" at NTNU in 2025 [1]. Specifically, this chapter is inspired by subsections 2.2-2.5.

### 2.1 Sociology

This is some sociology[keydummydelete]

### 2.2 Equations

A simple equation can be included as:

$$r = 2\pi^2 \tag{2.1}$$

The text below shows an example of how to align equations on the equal sign, with only one reference for both. This may be useful for when they are linked and are actually only one equation but splitting them up makes it more readable.

$$\begin{aligned} a &= \sin^2(\Delta\phi/2) + \cos(\phi_1) \cdot \cos(\phi_2) \cdot \sin^2(\Delta\lambda/2) \\ d &= 2R \cdot \arcsin(\sqrt{a}) \end{aligned} \tag{2.2}$$

The whole equation can be referenced as "equation (2.2)", here showing the Haversine formula. One may also align sub-equations such that they are numbered the same but have a letter differentiating them as shown below. This can be used when they are linked, but you will need to reference both individual parts.

$$SSD = \sum_{i=1}^n (\vec{x}_i - \vec{\mu}_q)^2 \quad (2.3a)$$

$$SSE = \sum_{q=1}^k \delta_{rq} SSD \quad (2.3b)$$

These equations can be referenced by their specific sub-equation as "equation (2.3a)", or by the whole group as "equations (2.3)". The "double backslashes" in the .tex creates line spaces and gives more room around the equations and paragraphs. Use them as you think feels right.

## 2.3 Tables and footnotes

Here is an example of both a regular table with data and a table with split headers, for scientific usage. Do not use horizontal/vertical rulers between the data, or encase the table with rulers.

Statistic	Velocity	Altitude	1/Angle	Temp.
Mean	122.68	240.98	93.75	13.95
Std	224.51	145.88	60.39	4.44
Q1	28.00	111.60	34.15	10.60
Median	63.00	223.20	99.59	13.30
Q3	137.00	359.10	151.99	16.70
Min	0.00	1.00	0.00	3.30
Max	14519.00	616.70	180.00	32.10

**Table 2.3.1:** Table of dynamic feature statistics where outliers are included, for all data points. Velocity is given in *m/h*, the altitude in *mamsl*, the inverse trajectory angle in 1/degrees, and temperature in degrees Celsius.

## 2.4 A single figure

Figure is included as an example. The square brackets before the caption description contains the title of the figure, which is what will be written in the list of figures. This should be short and concise. The same layout applies to tables

---

<sup>1</sup>A footnote explaining something.

<b>Area 1</b>	<b>Start date</b>	<b>End date</b>
2018	03.06	29.06
2019	03.06	03.07 or 31.08 <sup>1</sup>
2020	03.06	05.09
<b>Area 2</b>	<b>Start date (farm 1/2)</b>	<b>End date</b>
2012	09.06	07.09
2013	23.06 / 15.06	25.08
2014	05.06 / 25.06	10.09
2015	13.06 / 03.07	06.09
2016	17.06	22.07

**Table 2.3.2:** Selected time ranges for the data in all areas and all years.

and other floats. Remember to change the title as well as the caption if you are copying these examples. In the list of figures and tables all the different floats will be grouped together by chapter. Remember to always reference all your figures and tables in the text at least once.

## 2.5 Citations



## GRAPH THEORY

Here all relevant theory on graphs will be presented, only graphs used for simulation will be presented, and the methods for creating them will be described in section 5.1.

### 3.1 Graphs



## DISTRIBUTED HYPOTHESIS TESTING MODEL

This section will contain all the relevant theory of the DHT model, not including graphs or sociology.

### 4.1 Model theory



## METHODS

Include the complete description of the methods used in your research here.

Below is an example of how subsectioning works. The sections and subsections will be included in the table of contents, while subsubsections will not be in the table of contents but still have their own title in the text.

### 5.1 Creating graphs

#### 5.1.1 Subsection one

##### 5.1.1.1 Subsubsection one

##### 5.1.1.2 Subsubsection Two

#### 5.1.2 Subsection Two

### 5.2 Section two



## RESULTS

Here results will be presented, but not discussed.

### 6.1 More figures

page fill page fill page fill page fill page fill page fill page fill page fill page fill page  
fill page fill page fill page fill page fill page fill page fill page fill page fill page fill  
page fill page fill page fill page fill page fill page fill page fill page fill page fill page  
fill page fill page fill page fill page fill page fill page fill page fill page fill page fill  
page fill page fill page fill page fill page fill page fill page fill page fill page fill.



## DISCUSSION

Discuss your results here.

### **7.1 Future work**

Include a section about what should or could be done in future research, or explain any recommended next steps based on the results you got. This should be the last section in the discussion.



## CONCLUSIONS

Give a concise summary of your research and finding here, and include a short summary of any future work as well.



## REFERENCES

- [1] Audun Sørheim. *Beliefs and the Propagation of Misinformation in Social Networks*. 2025.



## APPENDICES

## A - GITHUB REPOSITORY

All code and latex-files used in this document are included in the Github repository linked below. Further explanations are given in the readme-file.

### **Github repository link**

- [https://github.com/ninasalvesen/thesis\\_latex\\_template](https://github.com/ninasalvesen/thesis_latex_template)

## B - SIDENOTE STATISTICS

### B1 - Some random table

Remember to only include one thing per page in the appendices.

Statistic	One	Two
Count	387317	283960
Mean	130.66	134.18
Std	248.09	230.32
Q1	31.00	21.00
Median	67.00	63.00
Q3	142.00	159.00
Min	0.00	0.00
Max	14519.00	14253.00

**Table B.1:** Table of statistics on some sidenote data.

## B2 - Some other random table

Statistic	Three	Four
Count	387317	283960
Mean	130.66	134.18
Std	248.09	230.32
Q1	31.00	21.00
Median	67.00	63.00
Q3	142.00	159.00
Min	0.00	0.00
Max	14519.00	14253.00

**Table B.2:** Table of statistics on some other sidenote data.