



**Universidade do Minho**

Escola de Engenharia

Departamento de Informática

Jorge Caldas

## **Analysis and Visualisation of Social Networks**

September 2016



**Universidade do Minho**

Escola de Engenharia

Departamento de Informática

Jorge Caldas

## **Analysis and Visualisation of Social Networks**

Master dissertation

Master Degree in Computer Science

Dissertation supervised by

**Pedro Rangel Henriques**

**Alda Lopes Ganarski**

September 2016

---

## ACKNOWLEDGEMENTS

---

Write acknowledgements here

---

## ABSTRACT

---

Write abstract here (en) or import corresponding file

---

## RESUMO

---

Escrever aqui resumo (pt) ou importar respectivo ficheiro

---

## CONTENTS

---

1	INTRODUCTION	1
1.1	Context and Problem	1
1.2	Motivation	1
1.3	Goals	1
2	SOCIAL NETWORKS IN SOCIOLOGY	2
3	ONLINE SOCIAL NETWORKS	3
3.1	SN A	3
3.1.1	Domain Modeling	3
3.1.2	API	3
3.2	SN B	3
3.3	SN C	3
4	SOCIAL NETWORK ANALYSIS	4
4.1	Network Analysis	4
4.1.1	Scientific Background	4
4.1.2	Power Law	4
4.1.3	Centrality Measures	4
4.1.4	Link Analysis	4
4.1.5	...	4
4.2	Network Visualisation	4
4.3	Real World Applications	4
5	STATE OF THE ART	5
5.1	Basics/Background/Related work	5
6	THE PROBLEM AND ITS CHALLENGES??	6
7	PROPOSED SOLUTION	7
7.1	Solution Requirements	7
7.1.1	Requirements Analysis	7
7.1.2	Requirements Specification	7
7.1.3	Requirements Prioritisation	7
7.2	System Modeling	7
7.3	System Architecture	7
7.4	Technology Selection	7
7.4.1	Technology A	7
7.4.2	Technology B	7

7.4.3	Technology C	7
7.4.4	Technology Comparision	7
7.4.5	Decision	7
8	IMPLEMENTATION	8
8.1	Data Extraction	8
8.1.1	Data Sources	8
8.2	Data Mining	8
8.3	Back end	8
8.4	Front end	8
8.5	Outcomes	8
9	CASE STUDIES	9
9.1	Results	9
9.2	Discussion	9
9.3	Summary	9
10	CONCLUSION	10
10.1	Conclusions	10
10.2	Prospect for future work	10
A	SUPPORT MATERIAL	11

---

## LIST OF ABBREVIATIONS

---

<b>SN</b>	Social Network
<b>SNA</b>	Social Network Analysis
<b>ONS</b>	Online Social Network



---

## LIST OF FIGURES

---

---

## LIST OF TABLES

---

---

## INTRODUCTION

---

### 1.1 CONTEXT AND PROBLEM

SNs, SNAs, OSNs, Unstructured Data Analysis

### 1.2 MOTIVATION

### 1.3 GOALS

---

## SOCIAL NETWORKS IN SOCIOLOGY

---

---

## ONLINE SOCIAL NETWORKS

---

Present table and comment. A, B and C are studied more deeply in the following sections.

### 3.1 SN A

#### 3.1.1 *Domain Modeling*

#### 3.1.2 *API*

### 3.2 SN B

### 3.3 SN C

---

## SOCIAL NETWORK ANALYSIS

---

### 4.1 NETWORK ANALYSIS

#### 4.1.1 *Scientific Background*

*Graphs*

*Statistics*

...

#### 4.1.2 *Power Law*

#### 4.1.3 *Centrality Measures*

#### 4.1.4 *Link Analysis*

#### 4.1.5 ...

### 4.2 NETWORK VISUALISATION

It's a science by itself.

### 4.3 REAL WORLD APPLICATIONS

What SNAs are used for.

---

## STATE OF THE ART

---

State of the art review; related work

### 5.1 BASICS/BACKGROUND/RELATED WORK

Example of a citation where the author should be cited directly on the text like, the work of ?, on producing L<sup>A</sup>T<sub>E</sub>Xfiles with BibT<sub>E</sub>X references.

Another way of citing without a direct mention to the author can be used like the work done on C language (?).

---

## THE PROBLEM AND ITS CHALLENGES??

---



---

## PROPOSED SOLUTION

---

### 7.1 SOLUTION REQUIREMENTS

#### 7.1.1 *Requirements Analysis*

#### 7.1.2 *Requirements Specification*

#### 7.1.3 *Requirements Prioritisation*

### 7.2 SYSTEM MODELING

### 7.3 SYSTEM ARCHITECTURE

### 7.4 TECHNOLOGY SELECTION

#### 7.4.1 *Technology A*

#### 7.4.2 *Technology B*

#### 7.4.3 *Technology C*

#### 7.4.4 *Technology Comparision*

#### 7.4.5 *Decision*

---

## IMPLEMENTATION

---

### 8.1 DATA EXTRACTION

#### 8.1.1 *Data Sources*

### 8.2 DATA MINING

### 8.3 BACK END

### 8.4 FRONT END

### 8.5 OUTCOMES

---

## CASE STUDIES

---

Application of main result (examples and case studies)

9.1 RESULTS

9.2 DISCUSSION

9.3 SUMMARY

---

## CONCLUSION

---

Conclusions and future work.

### 10.1 CONCLUSIONS

### 10.2 PROSPECT FOR FUTURE WORK



---

## SUPPORT MATERIAL

---

Auxiliary results which are not main-stream; or

Details of results whose length would compromise readability of main text; or

Specifications and Code Listings: should this be the case; or

Tooling: Should this be the case.