Aalto University
School of Science
Master's Programme in Computer, Communication and Information Sciences

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Inferring Voting Networks in Online Elections

Master's Thesis
Espoo, March 14, 2020

DRAFT! — March 23, 2020 — DRAFT!

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Title:			
Inferring Voting Networks in Online Elections			
Date:	March 14, 2020	**Pages:**	14
Major:	Computer Science	**Code:**	SCI3042
Supervisor:	Professor Aristides Gionis		
Advisor:	Blank M.Sc. (Tech.)		
abstract			
Keywords:	signed networks, balance, status, elections, Wikipedia, voting, graphs		
Language:	English		

Tekijä:	Ananth Mahadevan		
Työn nimi:			
Ohjelmistoprosessit mänteille: Uusi organisaatio, uudet pyörät			
Päiväys:	14. helmikuuta 2018	**Sivumäärä:**	14
Pääaine:	Tietotekniikka	**Koodi:**	SCI3042
Valvoja:	Professori Aristides Gionis		
Ohjaaja:	Diplomi-insinööri Blank		
Finnish Abstract			
Asiasanat:	Finnish Keywords		
Kieli:	Englanti		

Aalto-universitetet
Högskolan för teknikvetenskaper
Magisterprogrammet i data-, kommunikations- och infor- SAMMANDRAG AV
mationsteknik   DIPLOMARBETET

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Arbetets namn:			
Den stora stygga vargen: Lilla Vargens universum			
Datum:	Den 18 februari 2018	**Sidantal:**	14
Huvudämne:	Datateknik	**Kod:**	SCI3042
Övervakare:	Professor Aristides Gionis		
Handledare:	Diplomingenjör Blank		
Swedish abstract			
Nyckelord:	Swedish Keywords		
Språk:	Engelska		

Acknowledgements

Contents

Chapter 1

Introduction

1.1   Thesis Contribution

1.2   Thesis Outline

Chapter 2

Graph Theory and Wikipedia

Will provide background and concepts related to graph theory and Wikipedia. Then we will focus on the task of predicting the vote of an individual user given their voting history and current state of the election. We then present the local signed network based model that accurately predicts a user's vote.

2.1 Signed Graphs, Balance and Status

2.1.1 Graphs and Signed Graphs

- Discuss basic terms related to graph theory

- Define terms such as Nodes, Edges, direction, edge weight,

- successor, predecessor and neighbors

- Signed graphs and restrictions

- Explain relevance in real world settings

2.1.2 Balance Theory

- Explain balance theory origin and significance.

- Illustrate with traids and examples

- Define mathematical background to measure balance through the Eigen-decomposition of the graph Laplacian

2.1.3 Status Theory

- Describe the nature of the directed setting

- Illustrate the differences to Balance theory

- Mention existing ways to measure violation to status in a network

2.2 Elections in Wikipedia

- Explain Editors and Administrators in Wikipedia

- Describe the Request for Administrator(RfA) process

- Discuss general trends and patters

- Mention research interest and possible current works?

Chapter 3

Vote Prediction

In this section we discuss the vote prediction problem and the various approaches to solve it.

3.1 Signed Edge Prediction

- Discuss the existing edge predictions work

- Directly using signed traids as features

- Using triads along with network features

- Using user information and interaction data for predicting votes and/or elections

- The main drawbacks in these methods when considering an election setting

3.2 Linear Combination of Graphs

- Describe the linear combination of graphs derived from user and election data

- Explain topic similarity, follows network, interaction networks and other features

- How it can also incorporate signed features as additional features in prediction

3.3   Local Signed Network

- Explain the concept of the local signed network for a particular user

- Motivate the definition with respect to elections and influence

- Describe how to use balance and status theory to predict the vote

- Clarify the differences to signed edge prediction efforts

- Mention Agony as a way to measure status compliance here?

Chapter 4

Experiments

4.1 Datasets

4.2 Models

4.3 Evaluation

Chapter 5

Results and Discussion

5.1   Linear Combination of Graphs

5.2   Local Signed Network

5.3   Discussion

Chapter 6

Conclusions and Future Work