### Abstract

Abstract

# **Contents**

Abstract			i
1	Intr	oduction	1
2	Ana	lysis	2
	2.1	Problem analysis	2
	2.2	Literature analysis	2
	2.3	Lithuania's parliament open data analysis	2
	2.4	Method analysis	2
		2.4.1 MDS	2
		2.4.2 Unsupervised learning: <i>k</i> -means clusterization	2
	2.5	Visualizations	2
3	Soft	ware design	3
	3.1	Components of system	3
		3.1.1 Data flow diagram	3
	3.2	Tools	3
		3.2.1 Programming language: Scala	3
		3.2.2 Database: <i>MySQL</i>	3
	3.3	Downloader	3
	3.4	Coordinator	3
	3.5	API server	3
	3.6	Repository	3
	3.7	User interface (Frontend)	3
4	Description of experimental research 3		
	4.1	Data	3
		4.1.1 Data semantics	3
		4.1.2 Data statistics	3
	4.2	Experiments	3
		4.2.1 MDS	3
		4.2.2 Unsupervised learning: <i>k</i> -means clusterization	3
	4.3	Results	3
A	App	endix	i



# 1 Introduction

Introduction text

- 2 Analysis
- 2.1 Problem analysis
- 2.2 Literature analysis
- 2.3 Lithuania's parliament open data analysis
- 2.4 Method analysis
- 2.4.1 MDS
- 2.4.2 Unsupervised learning: k-means clusterization

Due missing labels of this dataset we are forced to look into unsupervised machine learning methods. *k-means* clusterization [?] is one such method and it fits well with our features. This is due TFIDF which transforms text into vectors be used with *k-means*. For distance between comments we can use cosine similarity [?] due its nature of performing better when comparing texts. To compare we can try with Euclidian and Manhattan distances too.

#### 2.5 Visualizations

### 3 Software design

### 3.1 Components of system

### 3.1.1 Data flow diagram

Data flow diagram

- 3.2 Tools
- 3.2.1 Programming language: Scala
- 3.2.2 Database: MySQL
- 3.3 Downloader
- 3.4 Coordinator
- 3.5 API server
- 3.6 Repository
- 3.7 User interface (Frontend)

### 4 Description of experimental research

- 4.1 Data
- 4.1.1 Data semantics
- 4.1.2 Data statistics
- 4.2 Experiments
- 4.2.1 MDS
- 4.2.2 Unsupervised learning: *k*-means clusterization
- 4.3 Results

### References

[1] J. Ratkiewicz, M. D. Conover, M. Meiss, B. Goncalves, A. Flammini, F. Menczer *Detecting and Tracking Political Abuse in Social Media*. In proceedings of the Fifth International AAAI Conference on Weblogs and Social Media, 2011.

# A Appendix