

Contents

1	Introduction	1
1.1	Network Science	2
1.1.1	Fundamentals of Graph Theory	3
1.1.2	Online Social Network	4
1.1.3	Community Detection	5
1.1.4	Polarization and Segregation	7
1.2	Natural Languages Processing	8
1.2.1	Automatic Text Classification	8
1.2.2	Main Approaches to Text Classification	10
1.2.3	Stance Detection	11
1.3	Network Analysis for Natural Language Processing	13
1.4	Research Questions	14
1.5	Contributions	16
1.6	Structure of the Thesis	17
2	Friends and Enemies of Clinton and Trump: Using Context for Detecting Stance in Political Tweets	21
2.1	Introduction	22
2.2	Detecting Stance on Tweets	23
2.3	Our approach	26
2.4	Evaluation	30
2.5	Conclusions	32
3	iTACOS at IberEval2017: Detecting Stance in Catalan and Spanish Tweets	35
3.1	Introduction	36
3.2	Our proposal	37
3.3	Experiments and Results	38
3.3.1	iTACOS experiments	39
3.3.2	Official results	40
3.3.3	A linguistic revision	40
3.4	Conclusions	41

4	Extracting Graph Topological Information and Users' Opinion	43
4.1	Introduction	44
4.2	Dataset	45
4.3	Content and Network Analysis	46
4.4	Discussion	50
5	Stance Evolution and Twitter Interactions in an Italian Political Debate	51
5.1	Introduction	52
5.2	Related Work	54
5.3	The CONREF-STANCE-ITA Corpus	55
5.3.1	Data Collection and Diachronic Perspective	55
5.3.2	Annotation for Stance	57
5.3.3	Social Media Networks Communities	59
5.3.4	Relations and Stance	60
5.4	Experiments	61
5.5	Discussion and Conclusion	63
6	Discussion of the Results	65
6.1	Introduction	65
6.2	An Analysis of the iTACOS Submission at IberEval 2017	68
6.2.1	Ablation Experiment in Official Runs	69
6.2.2	Evaluating iTACOS Features	71
6.3	MultiTACOS: Multilingual Stance Detection	73
6.3.1	Data Collection	74
6.3.2	Methodology	79
6.3.3	Experiments	83
6.3.4	Discussion	88
6.4	The Interplay of Online Social Networks and Users' Stance	89
6.4.1	Case Study	89
6.4.2	Methodology	90
6.4.3	Experiments	92
6.4.4	Discussion	93
6.5	Users' Interactions on Political Debates	94
6.5.1	Case Study	94
6.5.2	Methodology	95
6.5.3	Experiments	96
6.5.4	Discussion	104
6.6	Talent Identification as a Binary Classification Task	105
6.6.1	Case Study	105
6.6.2	Methodology	106
6.6.3	Experiments	107
6.6.4	Discussion and Conclusion	109

7	Conclusion and Future Work	111
7.1	Conclusion	111
7.2	Research Contributions	115
7.3	Future Work	118