Contents

I Introduction and Objectives **1**

1 Introduction and Objectives **3**
1.1 Motivation 6
1.2 Objectives 9
1.3 Structure of the Thesis 10
1.4 List of Publications 13
1.5 List of Research Projects 14

II Preliminaries and Literature Review **17**

2 Computational Argumentation from a Human Reasoning Perspective **19**
2.1 Introduction 20
2.2 The Computational Argumentation Process 22
2.3 Argument Mining 26
2.4 Argument-based Knowledge Representation and Reasoning 43
2.5 Argument-based Human Computer Interaction 58
2.6 The Future of Computational Argumentation 73
2.7 Conclusions 82

III Automatic Analysis of Argumentative Discourse **85**

3 VivesDebate: A New Annotated Multilingual Corpus of Argumentation in a Debate Tournament **87**
3.1 Introduction 88

3.2 Argumentation in Professional Debate Tournaments 91
3.3 Annotation Methodology 93
3.4 The VivesDebate Corpus 108
3.5 Related Work: Other Computational Argumentation Corpora . . . 112
3.6 Conclusion 117

4 A Cascade Model for Argument Mining 121
4.1 Introduction 121
4.2 Related Work 123
4.3 Budget Argument Mining 124
4.4 Model Architecture 126
4.5 Results 128
4.6 Discussion 132

5 Transformer-Based Models for Automatic Identification of Argument Relations 135
5.1 Introduction 136
5.2 Related Work 138
5.3 Data 139
5.4 Automatic Identification of Relational Properties 141
5.5 Evaluation 143
5.6 Conclusion 149

6 Automatic Evaluation of Argumentative Debates 151
6.1 Introduction 151
6.2 Related Work 153
6.3 Data 154
6.4 Method 155
6.5 Experiments 161
6.6 Automatic Evaluation of Argumentative Debates 164
6.7 Conclusions 166

7 VivesDebate-Speech: A Corpus of Spoken Argumentation 169
7.1 Introduction 169
7.2 The VivesDebate-Speech Corpus 171

7.3 Problem Description 173
7.4 Proposed Method 174
7.5 Experiments 176
7.6 Conclusions 180

IV Argument-based Computational Persuasion 183

8 A Qualitative Analysis of the Persuasive Properties of Argumentation Schemes 185
8.1 Introduction 186
8.2 Related Work 187
8.3 Background: Principles of Persuasion and Argumentation Schemes 190
8.4 Study Design 193
8.5 Results 198
8.6 Discussion 205
8.7 Conclusion 208

9 Toward the Prevention of Privacy Threats: How Can We Persuade Our Social Network Platform Users? 209
9.1 Introduction 210
9.2 Related Work 212
9.3 Study Design 215
9.4 Results 226
9.5 Conclusion and Future Work 234

10 Persuasion-enhanced Computational Argumentative Reasoning 235
10.1 Introduction 236
10.2 Related Work 238
10.3 Formalisation 241
10.4 Implementation of the Argument-based Persuasive Framework . . 246
10.5 Persuasive & Behaviour Change Evaluation 258
10.6 Discussion 262
10.7 Conclusion 264

V Discussion **267**

11 Discussion **269**

VI Conclusion and Future Work **273**

12 Conclusion and Future Work **275**

Bibliography **279**