

## Table of contents

<b>Chapter 1</b>	
<b>Introduction</b>	11
1.1 The goal	11
1.2 Contributions and Organization	14
<b>Chapter 2</b>	
<b>Literature review of Assignment, Renement and Retrieval</b>	17
2.1 Problems and Tasks	18
2.2 Scope and Aims	18
2.3 Foundations	20
2.4 Media for tag relevance	21
2.4.1 Tag based	22
2.4.2 Tag + Image based	23
2.4.3 Tag + Image + User information based	23
2.5 Learning for tag relevance	25
2.5.1 Instance-based	25
2.5.2 Model-based	27
2.5.3 Transduction-based	28
2.6 Auxiliary components	30
2.7 Conclusions	32
<b>Chapter 3</b>	
<b>A new Experimental Protocol</b>	33
3.1 Introduction	33
3.2 Datasets	34
3.3 Implementation and Evaluation	36
3.3.1 Evaluating tag assignment	37
3.3.2 Evaluating tag refinement	37
3.3.3 Evaluating tag retrieval	38
3.4 Methods under analysis	39
3.4.1 SemanticField	39
3.4.2 TagRanking	40
3.4.3 KNN	40
3.4.4 TagVote	41

## Image Understanding by Socializing the Semantic Gap

3.4.5 TagProp	41
3.4.6 TagCooccur	42
3.4.7 TagCooccur+	42
3.4.8 TagFeature	42
3.4.9 RelExample	43
3.4.10 RobustPCA	44
3.4.11 TensorAnalysis	45
3.4.12 Considerations	45
3.5 Evaluation	47
3.5.1 Tag assignment	47
3.5.2 Tag refinement	49
3.5.3 Tag retrieval	52
3.5.4 Flickr versus ImageNet	60
3.6 Conclusions	63

## Chapter 4

<b>A Cross Modal Approach for Tag Assignment</b>	65
4.1 Introduction	65
4.1.1 Contribution	68
4.2 Related Work	68
4.3 Approach	69
4.3.1 Visual and Tags Views	70
4.3.2 Kernel Canonical Correlation Analysis	72
4.3.3 Tag Assignment Using Nearest Neighbor Models in the Semantic Space	73
4.4 Experiments	77
4.4.1 Datasets	77
4.4.2 Evaluation Measures	79
4.4.3 Results	79
4.5 Conclusions	82

## Chapter 5

<b>Evaluating Temporal Information in Social Images</b>	85
5.1 Introduction	85
5.2 Data Analysis Method	87
5.2.1 Datasets	87
5.2.2 Temporal features	88
5.2.3 Flickr Popularity Model	89
5.2.4 Processing	90
5.2.5 Correlation analysis	91
5.3 Experiments and Discussion	92
5.3.1 Temporal Evaluation	92
5.3.2 Correlation Analysis	94
5.4 Conclusions	96

<b>Chapter 6</b>	
<b>Multimodal Feature Learning for Sentiment Analysis</b>	99
6.1 Introduction	99
6.2 Previous Work	101
6.3 The Proposed Method	103
6.3.1 Textual information	104
6.3.2 Textual and Visual Information	107
6.4 Experiments	110
6.5 Conclusions	116
<b>Chapter 7</b>	
<b>Popularity Prediction with Sentiment and Context Features</b>	119
7.1 Introduction	119
7.2 Related work	121
7.3 The Proposed Method	122
7.3.1 Measuring Popularity	122
7.3.2 Visual Sentiment Features	122
7.3.3 Object Features	123
7.3.4 Context Features	123
7.3.5 User Features	124
7.3.6 Popularity prediction	124
7.4 Experiments	124
7.4.1 Results	125
7.4.2 Qualitative Analysis	127
7.5 Conclusions	127
<b>Chapter 8</b>	
<b>Conclusion</b>	129
8.1 Summary of Contribution	129
8.2 Direction of future work	130
<b>Appendix A</b>	
<b>Publications</b>	133
<b>Bibliography</b>	137