

Contents

1	Introduction	1
1.1	Motivation	1
1.2	Concept of rating items by rating tags	2
1.3	Contributions	3
1.4	Overview of the dissertation	4
1.5	Publications	4
2	Preliminaries	7
2.1	Basic recommendation techniques	7
2.1.1	Notation and symbols	7
2.1.2	Collaborative filtering	8
2.1.3	Content-based recommendations	12
2.2	Evaluating recommender systems	15
2.2.1	Offline experiments	16
2.2.2	User studies	18
2.2.3	Online experiments	20
2.3	Recommendations based on Social Web tagging data	21
2.3.1	Using tags as content	22
2.3.2	Clustering approaches	24
2.3.3	Hybrid approaches	26
2.3.4	Tag-enhanced recommenders	29
2.3.5	Tag-based explanations	31
2.3.6	Outlook	32
3	LocalRank – A graph-based tag recommender	33
3.1	Introduction	33
3.2	Tag recommendations	34
3.3	LocalRank	36
3.4	Evaluation	38
3.4.1	Data sets	38
3.4.2	Evaluation procedure	38
3.4.3	Accuracy results	39
3.4.4	Run-time efficiency results	40
3.5	Summary and outlook	42
4	Improving recommendation accuracy based on item-specific tag preferences	43
4.1	Introduction	43
4.2	Illustrative example and overview of the approach	44
4.3	Estimating unknown tag preferences	45
4.4	Predicting item ratings from tag preferences	46
4.5	Evaluation	47
4.5.1	Data sets, tag quality, and data preprocessing	48
4.5.2	Algorithms	49
4.5.3	Accuracy metrics	50
4.5.4	Results and discussion	51

4.6	Related work and discussion	53
4.7	Summary and outlook	54
5	Evaluation of explanation interfaces in the form of tag clouds	57
5.1	Introduction	57
5.2	Evaluation factors of explanations in recommender systems	58
5.3	Overview of the evaluated explanation interfaces	60
5.4	Experimental setup	62
5.4.1	Experimental procedure	62
5.4.2	Participants of the study	64
5.4.3	Data collected in the experiment	65
5.5	Hypotheses, results, and discussion	65
5.5.1	Efficiency	66
5.5.2	Satisfaction	66
5.5.3	Effectiveness and persuasiveness	66
5.5.4	Implications for trust	67
5.6	Summary	67
6	An analysis of the effects of using different explanation styles	69
6.1	Introduction	69
6.2	Overview of the evaluated explanation interfaces	70
6.2.1	Herlocker et al.'s explanation methods	71
6.2.2	Tag cloud based explanation interfaces	72
6.3	Experimental setup	74
6.3.1	Experimental procedure	74
6.3.2	The underlying tagged movie data set	76
6.3.3	Hypothesis development	76
6.3.4	Participants of the study	77
6.3.5	Data collected in the experiment	77
6.4	Results and discussion	78
6.4.1	Efficiency	79
6.4.2	Effectiveness and persuasiveness	79
6.4.3	Transparency	82
6.4.4	Satisfaction	83
6.4.5	Relationships between variables	84
6.4.6	Implications for trust	86
6.5	Summary	87
7	Summary and perspectives	89
7.1	Contributions and limitations	89
7.2	Perspectives	91
A	Joint publications	93
B	Additional material for Chapter 6	95
B.1	Explanation interfaces used in the study	95
B.1.1	Bar charts	95
B.1.2	Rating- and prediction-based explanations	95
B.2	Statistics	97
B.2.1	Standard deviations	97
B.2.2	Friedman test	97
B.2.3	Wilcoxon Signed-Rank test	98
	Bibliography	112