

Contents

Abstract	i
Acknowledgments	ii
1. Introduction	1
1.1 Motivation	1
1.2 Thesis Statement and Scope	1
1.3 Contributions	1
2. Background and Related Work	2
2.1 Computational Collaboration Theories	3
2.1.1 Shared-Plans Theory	3
2.1.2 Joint-Intentions Theory	3
2.1.3 Hybrid Theories	3
2.1.4 Similarities and Differences	3
2.1.5 Applications of Collaboration Theories	3
2.2 Affective Computing	3
2.2.1 Affect and Emotions	3
2.2.2 Functions of Emotions	3
2.2.3 Motivation and Theory of Mind	3
2.3 Computational Models of Emotions	3
2.3.1 Appraisal Theory	3
2.3.2 Other Computational Models	3

2.3.3	Similarities and Differences	3
2.3.4	Applications in Autonomous Agents and Robots	3
3.	Affective Motivational Collaboration Theory	4
3.1	Introduction	4
3.1.1	Scenario	4
3.1.2	Example of a Collaborative Interaction	4
3.2	Design and Architecture	4
3.2.1	Mechanisms	4
3.2.2	Functions of Emotions	4
3.2.3	Mental States	4
3.2.4	Attributes of Mental States	4
4.	Computational Framework	5
4.1	System Overview	5
4.2	Components of the Architecture	5
4.2.1	Mental States	5
4.2.2	Collaboration	5
4.2.3	Appraisal	5
4.2.4	Coping	5
4.2.5	Motivation	5
4.2.6	Theory of Mind	5
4.2.7	Perception	5
4.2.8	Action	5
5.	Appraisal Processes in Collaboration Context	6
5.1	Introduction	6
5.2	Appraisal and Collaboration	6
5.3	Appraisal Algorithms	6
5.3.1	Relevance	6

5.3.2	Desirability	6
5.3.3	Expectedness	6
5.3.4	Controllability	6
5.4	Methodology [This chapter will contain the crowdsourcing study.] . .	6
5.5	Results and Evaluation	6
6.	Improving Human-Robot Collaboration	
	Using Emotional-Awareness	7
6.1	Introduction	8
6.2	Collaborative Behaviors and Emotional-Awareness	8
6.2.1	Goal Postponement	8
6.2.2	Goal Management	8
6.2.3	Task Delegation	8
6.3	Methodology	8
6.4	Results and Evaluation	8
7.	Conclusion	9
7.1	Discussion	9
7.2	Future Work	9
	Appendix A	11