Affective Motivational Collaboration Theory

by

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ABSTRACT

Abstract Here!

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CHAPTER 1
INTRODUCTION

1.1 Motivation

1.2 Thesis Statement and Scope

1.3 Contributions

Throughout this work we aim to show how a robot can leverage emotion-driven processes using appraisal algorithms to improve collaboration with humans. As such, in this thesis work, we introduce a novel framework, called Affective Motivational Collaboration (AMC) framework, which allows a robotic agent to collaborate with humans incooperating the underlying emotion-driven processes and the expressed emotion of human collaborator. Such a framework is built based on computational models of collaboration and appraisal allowing for task-driven interaction with robots or other agents. The theoretical foundation, computational models and algorithms as well as the overall framework, and the end-to-end evaluation of the framwork make the following contributions:

1. **Developing new computational models and algorithms for *Affective Motivational Collaboration Framework***:

   (Chapters 3 and 5) As mentioned earlier, since the theoretical foundation of AMC framework is built on the Shared-Plans theory of collaboration [cite] and

cognitive appraisal theory of emotions [cite], one of the contributions of our work is to create computational models and algorithms to compute the value of appraisal variables in a dyadic collaboration. Applying cognitive appraisal theory in the collaboration context is novel. Other models of the appraisal theory have not paid attention to the dynamics of the collaboration.

We have also developed a new algorithm for the emotion-driven goal management in the context of collaboration. Goal management is one of the important functions of emotions during collaboration. Existing models and implementations of emotions focus only on how emotions regulate and control internal processes and sometimes behaviors. This part of our work shows how appraisal components of the self and the human collaborator contributes to the goal management as an emotion function.

2. **Developing and implementing a computational model based on *Affective Motivational Collaboration Theory*:**

   My computational model will implement the key algorithms related to *Affective Motivational Collaboration Theory* as well as minimal implementation of other processes which are required for validation of the model but are not part of my thesis contributions. The emphasis of the model is on underlying cognitive processes embracing collaboration and appraisal concepts, rather than the Perception and the Action mechanisms.

3. **Validating *Affective Motivational Collaboration Theory:***

   I have identified eight key social characteristics (see Section **??**) which occur during the course of a collaboration. I will validate how the various functions of emotions give rise to these characteristics during collaboration. Specifically, I will first incrementally validate one or more of the computational components in my model starting with appraisal. Finally, I will conduct an end-to-end system evaluation with human subjects and a simulated robot.

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5.5 Results and Evaluation

CHAPTER 6

IMPROVING HUMAN-ROBOT COLLABORATION LATEX ERROR: THERE'S NO LINE HERE TO ENDSEE THE LATEX MANUAL OR LATEX COMPANION FOR EXPLANATION.YOUR COMMAND WAS IGNORED.TYPE I ¡COMMAND¿ ¡RETURN¿ TO REPLACE IT WITH ANOTHER COMMAND,OR ¡RETURN¿ TO CONTINUE WITHOUT IT.

$= *$

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