

Affective Motivational Collaboration Theory

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Abstract

We investigate the mutual influence of affective and collaboration processes in a cognitive theory to support the interaction between humans and robots or virtual agents. We will develop new algorithms for these processes, as well as a new overall computational model for implementing collaborative robots and agents. We build primarily on the *cognitive appraisal* theory of emotions (Gratch and C.Marsella 2004) and the *SharedPlans* theory (Grosz and Sidner 1990) of collaboration to investigate the structure, fundamental processes and functions of emotions in a collaboration context. As part of this work, we also address a deficiency in existing cognitive models by accounting for the influence of motivation on collaborative behaviors, such as overcoming an impasse. This motivation mechanism uses the results of cognitive appraisal to dynamically form new beliefs and intentions related to the collaboration structure.

Ronald De Sousa in *The Rationality of Emotion* (Sousa 1990) makes a good case for the claim that humans are capable of rationality largely because they are creatures with emotions. The idea of having robots or other intelligent agents living in a human environment has been a persistent dream from science fiction books to artificial intelligence and robotics laboratories. However, there are many challenges in achieving collaboration between robots and humans in the same environment. Some of these challenges involve physical requirements, some involve cognitive requirements, and some involve social requirements. Thus far, there has been an emphasis on the design of robots to deal with the physical requirements. Many researchers are also working on the cognitive requirements, inspired by a diverse set of disciplines. As time passes, there has been an increasing recognition of the importance of the social requirements.

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```
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```

area)
}
%%
% Section Numbers
% Uncomment if you want to use section numbers
% and change the 0 to a 1 or 2
% \setcounter{secnumdepth}{0}
%%
% Title, Author, and Address Information
\title{Title}
\author{Author 1 \and Author 2\\
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\And
Author 3\\
Address line\\
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\And ... \And Author n\ \  
Address line\ \ ... \ Address line}
```

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\AND  
Author 2 \ Address line \ \ ... \ Address line\ \  
\And  
Author 3 \ Address line \ \ ... \ Address line\ \  
}
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```
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```

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Journal Article

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Magazine Article

Hasling, D. W.; Clancey, W. J.; and Rennels, G. R. 1983. Strategic Explanations in Consultation. *The International Journal of Man-Machine Studies* 20(1): 3–19.

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Clancey, W. J. 1983b. Communication, Simulation, and Intelligent Agents: Implications of Personal Intelligent Machines for Medical Education. In *Proceedings of the Eighth International Joint Conference on Artificial Intelligence*, 556–560. Menlo Park, Calif.: International Joint Conferences on Artificial Intelligence, Inc.

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University Technical Report

Rice, J. 1986. Polygon: A System for Parallel Problem Solving, Technical Report, KSL-86-19, Dept. of Computer Science, Stanford Univ.

Dissertation or Thesis

Clancey, W. J. 1979b. Transfer of Rule-Based Expertise through a Tutorial Dialogue. Ph.D. diss., Dept. of Computer Science, Stanford Univ., Stanford, Calif.

Forthcoming Publication

Clancey, W. J. 1986a. The Engineering of Qualitative Models. *Forthcoming*.

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L^AT_EX 209 Warning

If you use L^AT_EX 209 we will not be able to publish your paper. Convert your paper to L^AT_EX 2_ε.

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We request that you name your L^AT_EX source file with your last name (family name) so that it can easily be differentiated from other submissions. If you name your files with the name of the event or “aaai” or “paper” or “camera-ready” or some other generic or indecipherable name, you bear all risks of loss — it is extremely likely that your file may be overwritten.

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If you have any questions about the preparation or submission of your paper as instructed in this document, please contact AAAI Press at the address given below. If you have technical questions about implementation of the aaai style file, please contact an expert at your site. We do not provide technical support for L^AT_EX or any other software package. To avoid problems, please keep your paper simple, and do not incorporate complicated macros and style files.

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Additional Resources

L^AT_EX is a difficult program to master. If you’ve used that software, and this document didn’t help or some items were not explained clearly, we recommend you read Michael Shell’s excellent document (testflow doc.txt V1.0a 2002/08/13) about obtaining correct PS/PDF output on L^AT_EX systems. (It was written for another purpose, but it has general application as well). It is available at www.ctan.org in the tex-archive.

Acknowledgments

AAAI is especially grateful to Peter Patel Schneider for his work in implementing the aaai.sty file, liberally using the ideas of other style hackers, including Barbara Beeton. We also acknowledge with thanks the work of George Ferguson for his guide to using the style and BibTeX files — which has been incorporated into this document — and Hans Guesgen, who provided several timely modifications, as well as

the many others who have, from time to time, sent in suggestions on improvements to the AAAI style.

The preparation of the L^AT_EX and BibTeX files that implement these instructions was supported by Schlumberger Palo Alto Research, AT&T Bell Laboratories, Morgan Kaufmann Publishers, The Live Oak Press, LLC, and AAAI Press. Bibliography style changes were added by Sunil Is-sar. \pubnote was added by J. Scott Penberthy. George Ferguson added support for printing the AAAI copyright slug. Additional changes to aaai.sty and aaai.bst have been made by the AAAI staff.

Thank you for reading these instructions carefully. We look forward to receiving your electronic files!

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