The Critical Agent Dialogue (CrAg) Project

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Abstract

The aim of this project is to build and evaluate a simple, adaptable natural language generation system which can generate dialogue incorporating relatively subtle linguistic features which reflect dimensions of personality such as extraversion and neuroticism. The system will then be evaluated to investigate the impact on user impressions of altering personality parameters.

1 Introduction

The aim of the Critical Agent Dialogue (CrAg) project[1] is to build and evaluate a simple natural language generation system which can produce dialogue involving relatively subtle language features reflecting dimensions of personality. The generation model will also be informed by the Interactive Alignment Model put forward by Pickering and Garrod (2003).

The system will be demonstrated via a pair of 'artefact critical agents', who will play the part of movie reviewers, putting forward opinions and arguing about recent movie releases. The dialogues are intended to resemble those from popular television shows, such as Ebert and Roeper in the US, in which film critics discuss new releases. (We also hope to be able to model Statler and Waldorf, the grumpy old men from the Muppet Show, once we have determined their personality types.) The goal is for the personalities of the critics to be clearly identifiable through their use of language, and for the interaction between them to be believable and engaging for both researchers and the general public.

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2 Personality Features and Alignment

The generated dialogues will vary according to the personality type assigned to the characters, based on recent research into different vocabulary, syntax and dialogue strategies exhibited according to personality type (Gill and Oberlander, 2002). This research uses Eysenck's three factor model (Eysenck and Eysenck, 1991), in which personality is described in terms of the three dimensions Psychoticism, Extraversion, and Neuroticism, each of which can separately influence language production.

Each character's utterances will also vary in reaction to the utterances of the other participant in the dialogue. Garrod and Pickering's Interactive Alignment Model (Pickering and Garrod, 2003) argues that common ground (Wilkes-Gibbs and Clark, 1992) need not be explicitly computed during dialogue, but that it arises as a by-product of intra- and inter-personal priming processes, by which dialogue participants align their representations at every level, including lexical, semantic, and syntactic.

Some example hypotheses about the way in which personality interacts with dialogue behaviour are: high Psychotics are individualistic; they are less worried about others' opinions and are less likely to align. High Extraverts want to gain and retain the conversational floor. Their utterances are longer, and they tend to align with their dialogue partner. High Neurotics are likely to talk about themselves and choose negative content.

User evaluations will assess subjects' judgements concerning the distinctiveness, friendliness, trustworthiness, continuity, motivation, engagement and sociability of the individual agents in the pair, and the pair taken together. This will allow us to test hypotheses about how users' personality types affect the way in which they react to different agents (Nass and Moon, 2000).

3 System Design

The dialogue system will use the Stanford Open Agent Architecture (OAA) (Cheyer and Martin, 2001) and the Edinburgh DIPPER architecture (Bos et al., 2003) as a framework for the dialogues. We are considering the use of Information States (Traum and Larsson, 2003) to manage dialogue moves. The generation will be done using the OpenCCG Realizer (White and Baldridge, 2003), with an extended grammar to cover the movie domain.

Initial data on the subject and style of movie reviews is being gathered to extract domain-specific vocabulary and to aid in compiling a list of topics which commonly occur. Topics found so far include: dialogue, action, humour, special effects, story, ending, protagonist, fight sequences, plot holes, directing style, cinematography style, director, music, character development. A corpus of spoken dialogues where the participants exchange views on a given movie is in preparation. The personality types of the agents and the data about the movies under review will be stored as XML documents. The design will be informed by the formats used by the NECA project (Piwek, 2003).

We intend to use a mixture of deep and surface generation, so that utterances generated from scratch can be combined with longer pieces of text from the database describing an aspect of one of the topics mentioned above. This strategy follows the one used successfully by the M-PIRO project (Isard et al., 2003).

4 Conclusions

We hope, by altering personality parameters, that we can create agents which have noticeably different characteristics and different dialogue strategies. We will be attempting to model this behaviour and later to assess whether human observers find dialogues which contain alignment to be more realistic. In the process, we hope to generate dialogues that are intrinsically interesting and entertaining to observe.

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