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Literary Cognition and Aesthetic Computing

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Literary text as a cognitive science problem
As a natural expansion from the tradition of natural language processing research, this paper presents our approach toward the poetic and artistic aspects of the human cognitive system. Our mental processes wouldn't stop when they understand the meaning of text. We always evaluate and appreciate them. Sometimes we contemplate, meditate and are moved. Cognitive science needs to invent vocabularies to describe these aspects of mental processes. We assume that the interesting natures of literary texts are projecting following important problems:
(a) Successful literary texts attract readers, give motivations to read through, evoke subjective emotional experiences of "moved". (emotion problem)
(b) Many literary texts deal with fictitious contents. Transfer of factual knowledge may not be a major task of those texts. (knowledge problem)
(c) Successful literary texts receive high evaluations as artistic artifacts. Society of intelligent agents has mechanism to support such social activities. (art problem)

Based on psychological evidences, we have proposed an emotion oriented natural language processing model, particularly, a wish generation mechanism and an aesthetic emotion evocation mechanism (Tokosumi, 2001, Yoshimine and Tokosumi, 2001). The present paper is an attempt to give a partial answer to the emotion problem, and suggests possible solutions for the knowledge problem and the art problem.

Cognitive Computation hierarchy
The concept of affective computing (Picard, 1997) has advanced the way we talk about cognitive activities. Literary computing as a subordinate of aesthetic computing may bring new perspectives into the way we talk about language processing (Fig. 1)

In the set of programs called KEWP (Knowledge and Emotion Workbench Programs), we have been formalizing people's emotional experiences evoked by stories and other multimedia objects, which include content oriented emotions and aesthetic emotions.

Aesthetic emotions in literary experiences
Aesthetic emotions evoked by the quality of objects, such as linguistic expressions and other artistic forms, are important class of emotions yet to be investigated fully. Our treatment of aesthetic emotions described here is based on the cognitive theories of emotion (e.g. Frijda, 1986). We identify a cognitive appraisal component and an action readiness component for various aesthetic experiences and propose computational mechanisms to implement those components in the KEWP model.

Cognitive factors each component can deal with are:
(a) Cognitive appraisal component -- completeness, novelty, memory, ability recognition, competence, assimilation.
(b) Action readiness component -- possession, re-experience, creation, evangelic.

We also discuss the implication of the model as a competence-based neural architecture of the brain (Tokosumi et al., in press).

References

Aesthetic Computing
literary computing, poetic computing, music computing, ...
Tokosumi (2001), Yoshimine and Tokosumi (2001)

Affective Computing
emotion/affect representation, emotional inference,...

Knowledge Computing
knowledge representation, case-based inference,...

Fig. 1. Cognitive computation hierarchy.