A Study of Affective Computing from A Multidimensional Perspective and A Preliminary Investigation of Intelligent Narrative Model

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ABSTRACT

Affective computing is one of the most active research problem in the field of artificial intelligence, which involves computers, linguistics, computational linguistics, cognitive psychology, and even brain neuroscience. Textual affective computing is an important topic of research in the field of linguistic intelligence research, which allows computers to express true feelings like humans, or allows computers to have the ability to empathize like humans, which is the hot and difficult point of linguistic intelligence research, and is also the goal of research scholars.

Keywords: emotion, affective computing, Intelligent Narrative, Language Intelligence

1. INTRODUCTION

With the wave of artificial intelligence, textual emotional computing has also emerged. Under the background of big data, 5G, and constant iteration of computer hardware, the demand for intelligence in people's daily life is increasingly high, such as: smart home, smart medical, smart transportation, etc. In the research of artificial intelligence, emotion itself is a part of intelligence, and an intelligent system without emotion can only be mechanical intelligence at best. In human-computer interaction, language itself is the carrier of emotion, thus highlighting the importance of textual emotion computing research.[4][5] From the research in recent years, scholars have mostly developed by taking advantage of new technological tools such as networked big data spawned by the information age, such as updated iterations of hardware and algorithms based on big data. Mostly from a single discipline, a single path to study emotional computing, such research results are bound to fail to reach the intelligence close to human life. With the demand of social productivity and economic development, cross-disciplinary development has become an inevitable trend, which also requires us to study the problem of textual emotion from the perspective of cross-disciplinary research. This paper compares the research on emotion and emotion computing from the perspective of multidisciplinary interdisciplinary research. This paper compares the research on emotion and emotion computing from the perspective of multidisciplinary research in order to better serve the research on language intelligence.[1][2]

2.THE EMOTIONSA FROM A MULTI-DIMENSIONAL PERSPECTIVE

2.1.THE DEFINITION OF EMOTION

"The word "emotion" was first used to express people's sentimental feelings about tragedy. "The definition of emotion in Modern Chinese is "the psychological reflection of affirmation or negation of external stimuli, such as like, anger, sadness, fear, love, disgust, etc." The Dictionary of Psychology defines emotion as "Emotion is a person's experience of the attitude of whether the objective things meet their needs,

is part of the attitude, is a more complex and stable attitude in the physiological physiological evaluation and experience."[3] In the Modern Chinese Dictionary, "emotion" is defined as "the mental state of excitement that arises when a person engages in a certain activity." Professor Picard makes a distinction between emotion and mood in "Emotional Calculus". According to her, "Emotion is a mental state that is realized many times on the basis of emotional experiences, which are more profound and stable, and affects our attitudes. Emotions and cognitive functions, etc." As far as the current research is concerned, many scholars do not have a clear definition of "emotion" and "mood", so this paper uses "emotion" to express them uniformly.

2.2. THE STUDY OF EMOTIONS FROM A PSYCHOLOGICAL PERSPECTIVE

Darwin believed that human emotions originate from nature, have existed and developed for a long time, exist in the human body, follow the laws of biology, and are passionate and irrational intuitions and impulses. 1872, Darwin examined such emotional phenomena as anxiety, sadness, disappointment, joy, hatred, anger, disgust, guilt, pride, wonder, fear, shame and shyness. The American psychologist William. James (1884) believed that emotions and feelings are a kind of strong feelings to the reaction of the organism, including the feelings of physical changes and moral, rational and aesthetic feelings, he divided emotions into two categories: rough (sadness, fear, anger, love, etc.) emotions and delicate (moral, rational and aesthetic) emotions. He considered "rough" emotions such as sorrow, fear, anger, etc. The "subtle" emotions, such as moral, are rational and aesthetic emotions, and from James' classification, the "rough" emotions are a direct instinctive mental reflection of stimulation, the most primitive kind of emotion, while The "delicate" emotion is a rational one, based on the processing of the "rough" emotion, rising to the rational perspective of the synthesis of an emotion, which is delicate, subtle and deep.

2.3. RESEARCH ON EMOTION FROM A PHILOSOPHICAL PERSPECTIVE

Most scholars at home and abroad have defined and classified emotion from the perspective of psychology, but most people think that emotion only belongs to the scope of psychology, but emotion is reflected in all aspects of life, and its definition and classification from the perspective of psychology alone is far from enough, because emotion involves many social disciplines such as psychology, cognitive science, sociology, anthropology, behavior, management, aesthetics, ethics, etc. The 18th century English philosopher David Hume divided human nature into knowing, knowing, knowing, and knowing. The 18th century English philosopher David Hume divided human nature into knowledge, emotion and

morality, and he linked emotion with ethics and considered emotion as the basis of ethics. The Western irrational philosopher Schopenhauer regarded "ego," "will," "vital impulse," "intuition," etc. as the This is also the fundamental principle of being human. Miao Qiusheng (2014) defines emotion from an existential perspective, stating that emotion is a specific property of a specific subject and a specific object, which, when interacting with each other, causes a specific feeling of pleasure or pain in the subject. Emotions that are built up in the subject's brain as a result of the mapping of connections between objects are imaged in the brain. The connections imaged by this emotion have stability and when sublimated will be a presence of judgment and thought.

The viewpoint of value theory considers emotion to be a value in essence, an emotion that people as subjects have about whether people, things and objects in the outside world can produce value for themselves. From the evaluation theory, people's true feelings and understanding and attitude towards certain state of affairs is whether the external object can satisfy their own subjective spiritual needs after interacting with the external world through practical activities, and if it can satisfy their spiritual needs, they will flourish positive emotions such as like and love, and if they fail to satisfy their needs, they will produce negative emotions such as rejection and disgust. In other words, the value of external people, things and objects determines the emotion of the subject, and the change of emotional state follows the change of value state. No matter how people portray the complex emotional world, and no matter how complicated the emotional world is, emotions are always closely related to whether people's desires are satisfied or not. The emotions of recognition and affection that arise from the satisfaction of desires are extended to other subtle positive emotions. The emotions of rejection and disapproval that arise from unfulfilled desires extend to other subtle negative emotions, and fundamentally, these emotions arise from the interaction between subject and object, whether the value of the subject is satisfied.

## 2.4. THE STUDY OF TEXTUAL EMOTIONS FROM A COMPUTER PERSPECTIVE

In 1985, Professor Minsky, one of the founders of artificial intelligence, said in his monograph The Society of Mind: " The question is not whether intelligent machines can have any emotions, but The question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without emotions", emphasizing that emotion is an essential capability for machines to achieve intelligence.[10] In the early 1990s, Professor Peter Salovey of the Department of Psychology at Yale University introduced the concept of "affective intelligence", and an early systematic study of affective computing was conducted by Professor Rosalind W.

Picard of the Massachusetts Institute of Technology Media Laboratory. [9]Computing, which defines affective computing as the computational science of human emotion generation, emotion recognition, and emotion representation, which uses computer technology to realize the relationship between information carriers (e.g., physiological features, words in text, sounds, video images, etc.) and the polar tendencies (positive, negative, or neutral) and intensities of human emotions, in short Emotional computing research is an attempt to create a computer that can sense, recognize, and understand human emotions. and can respond intelligently, sensitively, kindly, and caringly to human emotions.

3.THE CONSTRUCTION OF INTELLIGENT NARRATIVE MODEL

Table 1. Model building
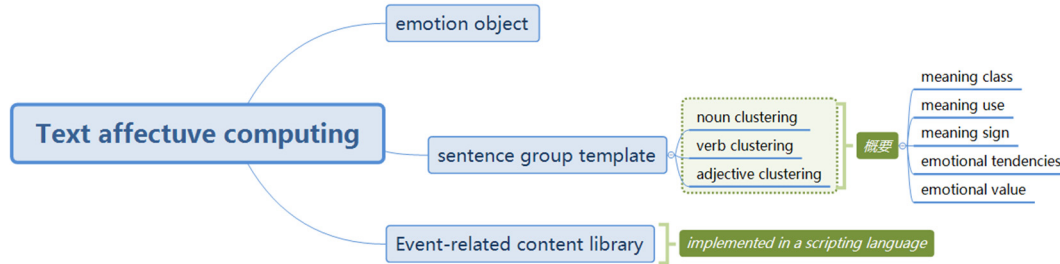
Based on the multidisciplinary research on emotions such as psychology, cognitive linguistics and philosophy, we can explore the multidisciplinary integration to construct a multiple emotion intelligent narrative model. From a philosophical perspective, we divide emotions into four categories: sense of identity, sense of pleasure, sense of care, sense of security, etc. We measure and fine-tune the emotion vocabulary of each category, and finally determine the basic set of emotion words in these four categories. Regarding the intelligent narrative model, we set it as a three-paragraph format article, for example, expressing the theme of kinship, because the selected emotional expression objects are relatives, and we extracted the specific emotional expression objects by constructing a kinship network. The first and second paragraphs of the article are set as a specific sentence cluster template library, and different sentence cluster paragraphs can be generated automatically by making full use of the semantic clustering features of the kinship care emotion words, and by continuously iterating the formal language of the emotion words related to the meaning class, meaning use, meaning sign, emotion tendency, and emotion value. Among them, the middle paragraphs of the articles, from the perspective of event semantics, are labeled with their frame information such as time, place, and character, which are generated by the script language, and finally the combination of these three paragraphs can automatically generate different narrative articles of the affection class. Intelligent narrative model construction

4. CONCLUSION

In conclusion, affective computing is a brand-new research field with multidisciplinary intersection, which covers sensor technology, computer science, cognitive science, psychology, brain neuroscience, behavior, physiology, philosophy, anthropology, sociology and other disciplines, and the ultimate goal of affective computing is to give computers human emotional capabilities. In order to promote the research of affective computing, Zhou Jianjiao (2017) proposed "speech emotion analysis", "text emotion analysis", "facial expression emotion analysis", and "physiological signal emotion analysis", i.e., "pronunciation informed", "text informed", "face informed", and "wave informed". "Read the sound", "Read the text", "Read the face", "Read the wave". "Emotion" has been studied relatively deeply in psychology, philosophy, cognitive science, computational science, and language, which has promoted the longitudinal development of each discipline, but in the current innovation-led society that advocates cross-fertilization of various disciplines as a theoretical and methodological innovation, Zhou Jianjian (2017) from a philosophical From a philosophical perspective, Zhou (2017) divided emotions into four categories: identity, pleasure, care, and security, and he believed that identity is the preemergence stage of emotion and a value judgment, while pleasure, care, and security are a kind of emotional protective behavior. We counted the dictionaries in modern Chinese, and counted them according to the above criteria of emotional word division, and the results are as follows. This research idea integrates the research on emotion in cognitive psychology, computational science, philosophy, and language science, classifies emotion from a philosophical perspective, and conducts in-depth research on it to serve computer emotion computing. This is an innovation in research methodology, which compensates for the limitations of research on a single science following the path of the discipline.

Table 2. Sentiment word distribution
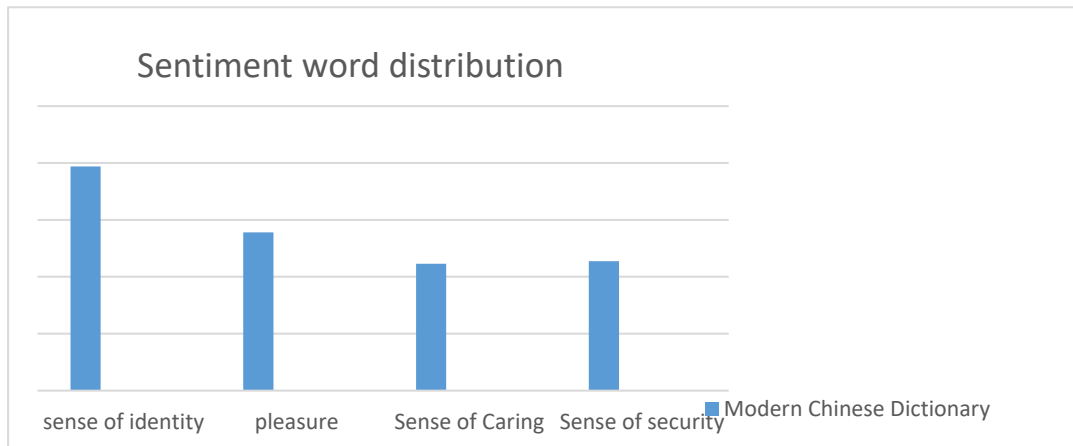
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