

Modeling and Simulation Analysis of Teaching Reform Ability Cultivation Based on Emotional Intelligence and High Performance Computing

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Abstract. As future teachers, most normal students lack the experience of inquiry learning in the learning stage, and if normal education cannot cultivate their research ability, they will lack the technical support and internal quality to lead students to carry out inquiry. The purpose of this paper is to study the modeling and simulation analysis of teaching reform ability training based on emotional intelligence and high-performance computing. This paper firstly collects literature on teaching reform, briefly introduces emotional intelligence and high-performance computing, and explores related research content at home and abroad. Secondly, this paper analyzes the current situation of the cultivation of teaching reform ability, analyzes the deficiencies and defects of the existing teaching reform ability, and analyzes the reasons for the deficiencies and how to make up for the deficiencies. This paper analyzes the application of emotional intelligence and high-performance computing related technologies in the modeling of teaching reform ability training, constructs related modeling and conducts simulation analysis, on this basis, improves the ability training modeling, and conducts modeling and simulation analysis through experiments. Experiments have shown that emotions in the emotional intelligence technology of this paper have a greater impact on decision-making, and the impact can reach more than 40. High-performance computing makes the execution speed about 10-15 times faster than traditional algorithms.

Keywords: Emotional Intelligence, High Performance Computing, Teaching Reform, Ability Development

1 Introduction

Improving teaching and research ability is one of the most important assets that qualified teachers should have, and it is an important position for teachers to improve

their teaching level and teaching quality. Ordinary students have insufficient learning and research ability, so the teaching level of ordinary students improves slowly after entering the workplace, and it is difficult to adapt to the development stage of the core curriculum reform. The new stage of basic education reform has raised new problems in many aspects, such as curriculum regulation, curriculum purpose, curriculum content, and curriculum penetration concept. The new requirements not only require the majority of teachers to combine exploration and collaborative efforts in teaching practice, but also require improving the teaching and research level of these teachers [1-2].

In the modeling and simulation analysis research of teaching reform ability training based on emotional intelligence and high-performance computing, many scholars have studied it and achieved good results. For example, Silva D believes that emotion is decision-making, perception, learning and other recognition The basis of knowledge function. It can be seen that emotion has an important influence on the cognitive behavior of the agent [3]. In Mamatova M, it is proposed that teaching should be implemented according to majors, and the teaching methods of "individualized, dialectical, seminar and interactive" should be advocated [4].

This paper firstly collects literature on teaching reform, briefly introduces emotional intelligence and high-performance computing, and explores related research content at home and abroad. Secondly, this paper analyzes the current situation of the cultivation of teaching reform ability, analyzes the deficiencies and defects of the existing teaching reform ability, and analyzes the reasons for the deficiencies and how to make up for the deficiencies. This paper analyzes the application of emotional intelligence and high-performance computing related technologies in the modeling of teaching reform ability training, constructs related modeling and conducts simulation analysis, on this basis, improves the ability training modeling, and conducts modeling and simulation analysis through experiments.

2 Research on Modeling and Simulation Analysis of Teaching Reform Ability Training Based on Emotional Intelligence and High-Performance Computing

2.1 Affective Agent Cognitive Behavior Framework Design

The cognitive behavior of affective agents studied in this paper involves psychology, physiology and cognitive science, and is a complex system. This system involves information transfer between multiple modules, so it is necessary to briefly discuss the information flow.

The cognitive framework of the agent designed in this paper mainly includes the following three modules: emotion generation module, rational cognition module and emotion-cognitive interaction module. First, in the emotion generation module, the emotion evaluation mechanism of the agent makes inferences based on external stimuli and the individual state, and matches the results with the emotion in the basic emotion database, and then obtains the individual's current emotional state, which is output to the agent's cognition. -Interaction module; secondly, in the rational cognition module, the agent does not consider the role of emotional factors, updates its belief base and

knowledge base through the perceived external environment information, and then combines the agent's current wishes and intentions to perform cognitive behavior. Inference and decision-making; finally, in the cognition-interaction module, based on rational cognition, the agent integrates the current state of the agent to make inference and decision-making, and then outputs the decision result to drive the physical action of the agent and act on the external environment [5-6].

Based on the principle of the whole first and then the part, the cognitive behavior framework of emotional agent is given first, and the function of each module is determined; then the model is developed and designed in detail for each module. Emotions are human attitudes and subjective experiences of the attributes of external things. Emotions affect all aspects of people's daily lives, and an agent without emotion does not have true artificial intelligence. Therefore, many scholars have studied emotion and its related fields. After decades of development, emotion research has come a long way. Many researchers have conducted in-depth research on emotion from the perspectives of psychology, physiology and neuroscience, including emotion mechanism, emotion information acquisition, emotion recognition, emotion modeling and understanding, emotion synthesis and expression, application of emotion computing, emotion Human-machine interface of computer, emotional transmission and communication.

The focus of this paper is the generation and expression of emotion, that is, emotion modeling. On the basis of learning from previous work, several important factors that affect the change of individual emotion are determined, and then an individual emotion model with individuality is designed based on cognitive evaluation theory. In the model, the generation of emotion is mainly affected by external stimuli, personality factors, the interaction between emotions, and emotional decay. In later chapters, the emotional model will be discussed in detail [7-8].

The hierarchical structure of behavior provides practical convenience for the interaction between emotion and cognition. The behavior set of the agent contains multiple levels of behavior. Among them, the behaviors at the top level are mostly abstract, and are often some behaviors that exist in the brain of the agent with guiding functions and can continue to be decomposed downwards. The underlying behavior is the actual actionable behavior, which is often closely related to the external physical performance of the agent. In the process of reasoning, the agent first determines the behavior of the top layer, and then goes down to the next layer one by one, and finally determines the behavior of the bottom layer. In the behavioral decision-making process of each level of the agent, emotional factors act on it, exert an influence on the behavioral choice of each level, and realize the reasoning and decision-making of the agent under the influence of emotion.

2.2 Analysis of the Current Situation of Professional Teaching Reform Ability Training

(1) Teachers and normal students have weak awareness of teaching reform and research

Teachers' understanding of the teaching reform process, specifically whether teachers are willing to conduct teaching reform research, and whether they have a deep understanding of valuable questions and surprises in their own writing and teaching. From research we found that the number of high school students writing textbooks in graduate textbooks is increasing every year. However, from the content

of the book, students found that the depth of the problems in the field of teaching reform was not enough, the level of thinking was not high, the creativity was lacking, and the knowledge of teaching reform and research was weak.

Second, teachers' cultural understanding deepens the importance and power of inquiry across the academic field. The emergence of understanding-based economics and social information in the 21st century and changes in many educational materials require educators to explore the rules of curriculum development and curriculum change. responsibility. Function. Teachers in some schools are stereotyped and have a negative attitude towards research-based training, including skills reserves, limited knowledge, poor academic performance and scientific research ability, and cannot guide students' training.

(2) There are misunderstandings in the understanding of teaching reform

One is that "science teaching and research are worthless". Many primary and secondary school teachers believe that "study and research in the workplace" will affect the teaching profession, so they separate teaching and scientific research from teaching, and even contradict each other. The second is the mystification of education and scientific research. Many educators believe that teaching and scientific research are the work of scholars and psychologists, internal and distant from each other. There is an important difference. The third is to promote and improve the scientific research work of teachers. Many educators believe that academic research means writing and publishing textbooks that explain the significance of academic research. In fact, teacher research is a specific type of "teaching and learning reform," which is a reflection and exploration of self-directed learning and teachers' self-directed learning activities, including the purpose of conducting reinforcement activities. Effective methods and improving student learning.

(3) Traditional education does not pay attention to the cultivation of teaching reform and research ability of teacher education majors

For a long time, my country's teacher education system has mainly focused on subject training activities for the purpose of imparting knowledge. However, there is a lack of emphasis on the training and competencies of ordinary students, as the indifference of training activities affects the training of teachers and the ability to carry out research to promote research - teaching, science, teaching materials and teaching methods. Enhanced research, cognitive programs, and strength training guides for regular students parting ways. The current problem for regular teachers is that, despite having subject knowledge, they do not understand and practice the skills of previous training activities, so they do not have the ability to develop academic and research skills before working [9-10].

2.3 Algorithm Selection

this paper, the relevant emotional intelligence model constructed in this paper affects the four components of emotional intensity:

- (1) The external stimulus component S_t of emotion
- (2) The affective component $I_{p, t}$ of personality influence
- (3) The mutual influence component $\phi(I_t)$ between emotions
- (4) Attenuation component $\varphi_t(I_{t-1})$ of emotion

Combining the above four components, the calculation formula of the current agent's emotional intensity is given [11-12]:

$$I_t = S_t + I_{p,t} + \phi(I_t) + \varphi_t(I_{t-1}) \quad (1)$$

The formula of emotion intensity provides specific method support for the subsequent update of emotion and the reasoning and decision-making of the agent under the influence of emotion.

Sentiment vector :

$$E_t = (e_{1,t}, e_{2,t}, \dots, e_{i,t}, \dots, e_{n,t}) = (f(I_{e1,t}, \omega_1), \dots, f(I_{ei,t}, \omega_i), \dots, f(I_{en,t}, \omega_n)) \quad (2)$$

By analyzing the above formula, we can easily know that the emotion of the agent corresponds to the intensity of emotion. Emotions are updated with changes in emotional intensity, and the updating of emotions is essentially the updating of emotional intensity.

3 Modeling, Simulation, Analysis, Research and Design Experiments Based on Emotional Intelligence and High-Performance Computing for Teaching Reform Ability Training

3.1 Behavioral Modeling Content

Behavior modeling can be divided into the following three aspects according to different research levels:

The first is to establish an individual cognitive behavior model, that is, to represent people's internal thinking activities, such as perception, reasoning, decision-making, planning, learning, etc., to explain the internal production mechanism of people's external behavior, focusing on rational behavior models;

The second is to establish a hierarchical organizational behavior model of teams and institutions, that is, to study group behaviors such as communication, interaction, collaboration, negotiation, and order within the organization and the combat behavior between groups (red and blue parties). Among them, organizational behavior is based on individual behavior;

The third is to establish a social behavior model, that is, to study the impact of social culture, values, psychology, etc. on individual and organizational behavior, focusing on the perceptual behavior model.

The focus of this study is the modeling of individual cognitive behavior, that is, the main study of the individual's internal thinking activities.

3.2 Experimental Design

This paper conducts experiments on the teaching reform ability training model constructed in this paper. First, it analyzes the emotional intelligence technology, and explores the influence of emotion on the decision-making of the agent and the influence of various emotions on various decision-making. Smart practical applications. The second is the speedup ratio of high-performance computing technology to execution time.

4 Experiment Analysis of Teaching Reform Ability Training Based on Emotional Intelligence and High Performance Computing

4.1 The Influence of Emotion on Agent Decision-Making

This paper designs experiments for the emotional intelligence technology in the teaching and reform ability training modeling constructed in this paper, mainly to explore the influence of emotion on the agent's decision-making, and to record the influence of various emotions on different decisions. The experimental data is shown in Table 1.

Table 1. Effects of emotions on agent decision-making

	wander	chase	attack	retreat
Joy	27	21	26	26
Sadness	24	23	28	25
Anger	24	22	41	13
Surprise	29	36	21	14
Fear	26	19	13	42
Disgust	17	22	38	23

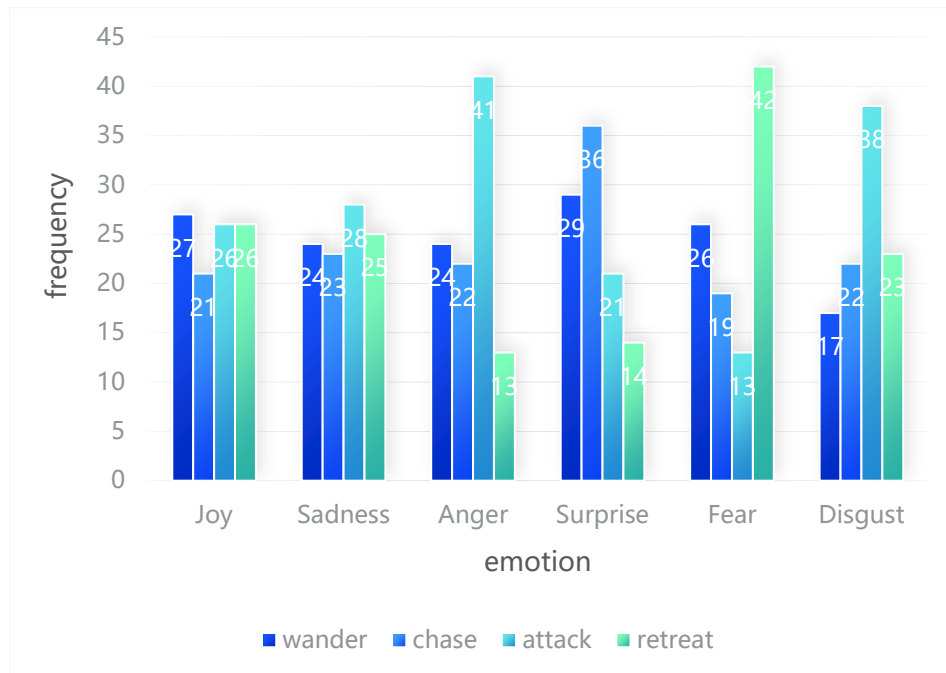


Fig 1. The influence of multiple emotions on the decision-making of different agents

It can be seen from Figure 1 that some emotions have a greater impact on some decisions. For example, the influence of anger on attack decision-making has reached 41, indicating that anger will be greatly affected in attack decision-making. In addition, disgust also affects aggression. Decision-making has a greater impact, reaching 38, and fear has a greater impact on back-off decision-making, reaching 42. Therefore, the use of emotional intelligence analysis can effectively predict the behavior of teaching reform ability training, and formulate better ability training plans.

4.2 High-Performance Execution Time

This paper conducts experiments on the high-performance computing technology used in this paper, and judges the performance and effect of the high-performance computing technology by using the high-performance algorithm to accelerate the execution time of the calculation. Record the execution time comparison of the two algorithms under different processing. The experimental data are shown in Table 2.

Table 2. Comparison of execution time of two algorithms on the same data

	1k	2k	3k	4k
CPU	12.0	96.0	400	537
GPU-RPC	1.5	7.7	16.2	32

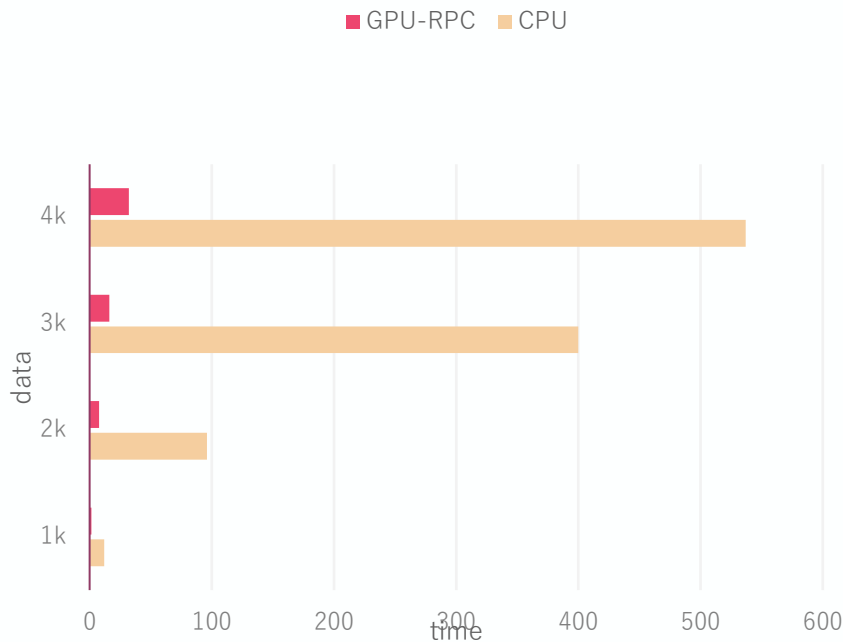


Fig 2. Comparison of execution time between high-performance computing algorithms and traditional algorithms

It can be clearly seen from Figure 2 that the execution speed of the high-performance computing algorithm is greatly improved compared with the traditional algorithm, and with the increase of the data set, the difference between the execution time of the high-performance computing algorithm and the traditional algorithm is getting bigger and bigger. The speed difference is about 10-15 times. It can greatly improve the simulation performance of modeling.

5 Conclusions

The basic principle of teaching review and teaching reform research is to apply what you have learned. It promotes a fundamental change in the teaching of ordinary students. Active and meaningful training behaviors will replace passive training behaviors without independent thinking. Acquiring knowledge and using knowledge will become pure training habits. This paper focuses on the impact of emotion on individual cognitive behavior. The main work of this paper can be divided into three parts: emotion model research, emotion-cognitive interaction framework design, model design and implementation. According to the deficiencies in the existing simulation systems and the need for modeling individual emotions, it is necessary to conduct modeling research on emotions and their impact on human cognitive behavior. This paper studies the efficient parallel computing model in high-performance computing technology in the big data environment. Since the existing GPU and MapReduce fusion models mostly use single-node and single-GPU computing cards, they have insufficient consideration for variable-length data processing and data skew processing, and do not have the characteristics of big data application scenarios, which can more effectively improve the ability to cultivate teaching reform capabilities. .

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