Research of university education intelligent agent

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**Abstract**. In view of the fact that the subsystems in the university education information system are separated and independent from each other and the data is not fully used, the concept of university education intelligent agent is put forward.University education intelligent agent based on the new campus infrastructure, includes adaptive evolution system of teaching system, data analysis system of the whole life cycle, man-machine integration decision-making system, etc., which makes data of teaching, scientific research, career development of teachers and students and social feedback accumulated and used, shortens optimization and evolution cycle of university education system, makes AI, big data, Internet of things technology in the application of intelligent education develop from dispersed independence to interconnected open.

**Keywords:** Intelligent Agent, University Education, New Infrastructure, Man-machine Integration.

1. Introduction

The range of new infrastructure is determined by China's National Development and Reform Commission on April 20, 2020 for the first time, namely the new infrastructure is a new development concept as the lead, with technology innovation as the drive, on the basis of the information network, high quality oriented development needs, provides infrastructure system of services such as digital transformation, smart upgrade, fusion innovation, mainly includes the information infrastructure, integration infrastructure, innovation infrastructure.

In recent years, universities have successively carried out the construction of smart campus. Smart classrooms have improved the efficiency of teachers' teaching and students' learning, electronic examination rooms have reduced the labor cost required for invigilation, video structured analysis system has effectively maintained the campus security, and so on.

However, functions of these campus construction projects are relatively single, connection is lack of between each function module, the data is not for effective analysis and mining, data of professional and academic development of teachers and students is lack of long-term tracking, which make the intelligent education is embodied in several points, and has not yet formed the breakthrough.

In order to effectively solve these problems, university education intelligent agent is constructed. Based on new infrastructure construction, artificial intelligence, big data and Internet of things technologies are applied to college teaching, social services and personalized data analysis of teachers and students, so that universities can form an internal loop and open external system and continuously evolve.

1. New smart campus infrastructure

Under the background of "new infrastructure", universities should upgrade and transform on the basis of the early construction of smart campus, integrate enterprises' cloud services according to their specialties, and form a fully functional, interconnected and data-sharing system to support the whole university education intelligence agent. The main functions include school situation analysis, normal recording and broadcasting, interactive teaching, visual supervision, electronic examination room, intelligent question-answering system, etc., as shown in the following figure:



**Fig.** New smart campus system architecture.

Core processing system: including intelligent computing and big data analysis platform, data center, etc., mainly completes data storage, processing, intelligent analysis, etc.

School situation analysis system: face recognition technology is used to deeply integrate the perception-free face attendance camera with the intelligent digital class CARDS and big data analysis system, so as to realize the management of teachers, students, courses, teaching affairs and sites, and carry out the comprehensive analysis of school situation through the collection and analysis of process data.

Interactive teaching system: it can realize distance teaching when teachers and students are in different spaces, and promote online and offline blended teaching.

Electronic examination: includes examination system, video search system, shielding system, identification system, command system, which realizes the whole process of comprehensive management, such as system management, online search, standardized test file management, examination paper circulation management, identity authentication, cheating in staff management, emergency command, control, data statistics, etc.

Normal recording and broadcasting system: recording of the class will be stored in the school Shared cloud platform, teachers and students can watch the live broadcast and recorded video at any time.

Visual teaching supervision: through the online system, the supervising teacher can check the actual situation of the class in each classroom and evaluate the class online, which can effectively reduce the impact on the teaching teachers and improve the efficiency of teaching supervision.

Intelligent question-answering system: based on big data processing, knowledge graph, intelligent decision-making, man-machine integration and so on, it provides accurate answers to various questions raised by students in the teaching of professional courses, effectively assists teachers in classroom teaching, and enhances students' learning effect.

## A subsection

Text.

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1. Teaching system adaptive evolution system

The development of artificial intelligence, big data, the Internet of things and other professional fields is very rapid. If the teaching system cannot keep pace with The Times and evolve iteratively, it is not conducive to the cultivation of students' knowledge, ability and quality employment, the development of teachers' ability and the development of scientific research, and ultimately, it is not conducive to the cultivation of high-level talents in universities. Therefore, the teaching system should be adjusted in time with the development of related professional fields.

On the basis of big data analysis platform, data mining analysis is regularly performed for teaching and scientific research, relevant policy, social services, teachers and students feedback, and evolution of teaching system optimization scheme is automaticly generated, then through the analysis of the expert group, man-machine integration mechanism is adopted to define the teaching system adjustment scheme, teaching system adaptive evolution system logic architecture is shown in the following figure:



**Fig. 2**Teaching system adaptive evolution system logic architecture.

1. Life cycle data analysis system

The accumulated data of every teacher in the teaching, scientific research, professional title evaluation and academic exchanges, awards, social services, etc, as well as the accumulated data of students in learning, examination, contests, graduation design, employment and career development, etc, are collected and stored up continuously, which is of great significance for development of university teachers and students. However, data has not yet been used to mine and correlate the value information. Therefore, the whole life cycle data analysis system is constructed to conduct tracking personalized data mining and analysis on teachers' teaching and research ability development and students' academic and career development on the basis of accumulated data, so as to provide references for the personal development of teachers and students and practical basis for the development of universities. The life cycle data analysis system logical architecture diagram is shown in the following figure:



**Fig. 3** Life cycle data analysis system logical architecture diagram.

1. Design of university education intelligent agent

University education intelligent agent is composed of intelligent computing and big data analysis platform, data center, the new smart campus system, the adaptive evolution system of teaching system, the whole life cycle data analysis system, expert system in man-machine integration, public cloud services platform and so on, which uses 5G network to realize connectivity. By integrated use of big data processing, deep learning, knowledge graph, man-machine integration, intelligent decision, network security technologies, it can collect continuous accumulation of multi-source data and conduct analysis and assistant decision-making, and form an open, adaptive and iterative evolution intelligent system.



**Fig. 4** University agent system architecture.

1. Conclusion

By constructing university education intelligent agent, smart classrooms, information platform, data center and other hard and software facilities which are disperse and independent are connected, and information isolated island is eliminated. Data of teaching, scientific research and professional development between teachers and students is accumulated and used, and systems of data mining and analysis, intelligent computing, man-machine integration decision-making are introduced to shorten the cycle of university education system optimization evolution, which makes artificial intelligence, big data, internet of things technology in the application of intelligent education from point to surface extension, creates the ubiquitous intelligence experience, strongly promote the university education development by leaps and bounds.

Acknowledgments

This work was supported by Hunan Provincial Education Department Foundation under grant No.18C1311.

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