E-Learning Using Artificial Intelligence

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Abstract: **This paper presents a new concept of intelligent e-learning systems with intelligent two-way communication between an e-learning system and the user.**

AI and its applications in the area of e-learning have played an important role to impart intelligence in e-learning tools and techniques. For about last two decades, the internet is being used to improve communication, collaboration, sharing of resources, promoting active learning, and delivery of education in distance learning mode. In recent years, many of the universities and educational institutions worldwide offer online services such as for admissions, virtual (online) learning environments in order to facilitate the lifelong learning and to make this compatible with other educational management activities.

The system uses intelligent methods for analysis, evaluation and assessment of user knowledge and skills as well as e-learning process control, supervision and optimization. The discussion focuses on recognition and evaluation. Artificial intelligence is a theory. It is realized in software are manufactured as hardware.

Keywords: **e-learning Systems, Distance Learning, Artificial Intelligence.**

1. INTRODUCTION

Artificial intelligence is a growing subfield of Computer Science. The term "Artificial Intelligence" was coined in 1956 at a conference aimed at using computers to simulate human intelligence. Game playing and theorem proving are two of the earlier attempts at getting computers to think intelligently. Search and logic formed the basis of the first AI systems.AI and its applications in the area of e-learning have played an important role to impart intelligence in e-learning tools and techniques. For about last two decades, the internet is being used to improve communication, collaboration, sharing of resources, promoting active learning, and delivery of education in distance learning mode.

This paper takes a step back and looks at the role that AI plays in Computer Science teaching and research since its inception, as well as areas for future development. The paper describes how AI is incorporated into the Computer Science curriculum. The paper also discusses how AI is used in the instruction of Computer Science courses. Research in artificial intelligence has grown rapidly since its inception. The three main directions of research are the application of AI techniques, the improvement of existing techniques and the development of new techniques. The following sections provide an overview of the current and future role of AI in Computer Science teaching and research.To facilitate quality education, the identification & selection of various factors that may influence a students academic performance is very important. Knowing these factors is Artificial Intelligence (AI) has evolved as one of the promising technology for achieving intelligence.AI and its applications in the area of e-learning have played an important role to impart intelligence in e-learning tools and techniques. The idea behind of using AI in e-learning is to facilitate quality education and training in a computer based system important for parents & teachers working positively on these factors may improve the performance of the student. AI that may result in development of e-learning systems that may extensively benefit in providing facilities more personalised & better decision support system (DSS). By offering such approach, education system could play much better for student centric operation towards positive improvement of his performance. For about last two decades, the internet is being sharing of resources, promoting active learning, and delivery of education in distance learning mode. The internet helps teachers in planning suitable online delivery structure, sharing goals of learning, and activities for their courses.
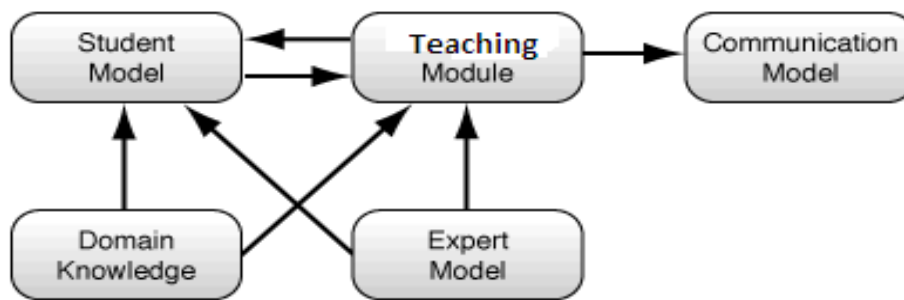
Figure 1: Interactions of components in an intelligent tutoring system.

Student Model:

The student model stores information that is specific to each individual learner. At a minimum, such a model tracks how well a student is performing on the material being taught. Since the purpose of the student model is to provide data for the teaching module of the system, all of the information gathered should be able to be used by the tutor.

Teaching Module:

This component provides a model of the teaching process. For example, information about when to review, when to present a new topic, and which topic to present is controlled by the teaching module. As mentioned earlier, the student model is used as input to this component, so the teaching Decisions reflect the differing needs of each student.

Domain Knowledge:

This component contains information the tutor is teaching, and is the most important since without it, there would be nothing to teach the student. One related research issue is how to represent knowledge so that it easily scales up to larger domains. Another open question is how to represent domain knowledge other than facts and procedures, such as concepts and mental models.

Communications Module:

Interactions with the learner input the screen layouts, are controlled by this component, including the. How should the material be presented to the student in the most effective way? This component has not been researched as much as the others, but there has been some promising work in this area.

Expert Model:

The expert model is similar to the domain knowledge in that it must contain the information being taught to the learner. However, it is more than just a representation of the data. It is a model of how someone skilled in a particular domain represents the knowledge i.e. one that is capable of solving problems in the domain . By using an expert model, the tutor can compare the learner's solution to the expert's solution, pinpointing the places where the learner had difficulties.

The learning environment:

Many systems attempt to provide instruction by simulating a realistic working environment in which the student can learn the task. Therefore, a realistic simulated learning environment can reduce both the cost and the risks of training.

2.   ARTIFICIAL INTELLIGENCE IN COMPUTER SCIENCE TEACHING

AI in the Computer Science:

The revised Computing Curricula report for Computer Science composed by the IEEE describes which AI (Intelligent Systems) topics are core and which are elective.

These are listed in. A course in artificial intelligence is usually in the final year of study, i.e. the third year of a three year degree or the fourth year of a four year degree. This serves as a foundation for students who will continue with further studies in CS and AI, while at the same time students, who will move on to industry, with alternative methodologies that

can be used to solve problems in various application domains. Earlier AI courses at this level covered the core topics, however currently some advanced topics are also included in the curriculum. The outcomes of an AI course at this level include the understanding of the concepts, knowledge of the advantages and limitations of the different methodologies.

Areas of AI in education:

The goal of AI in e-learning is to facilitate intelligent software to model human behavior, learning, natural language, Non monotonic reasoning, planning, and diagnosis, reasoning under uncertainty and temporal reasoning.

According to the "Artificial Intelligence in Education (AI-ED)", the main areas of the AI in education are:

 Intelligent Tutoring system

 Decision Support System

 Learning Management System

 Learning Environment

 Post Office

 Assessment of learning outcomes

 Social & Cultural aspect of learning

 Evaluation of computer systems

 Computer –assisted language learning

 Reading and writing

 Theories of teaching

Intelligent Systems in Your Everyday Life

• **Post Office**

– Automatic address recognition and sorting of mail

• **Banks**

– Automatic check readers, signature verification systems

– Automated loan application classification

• **Customer Service**

– Automatic voice recognition

• **The Web**

– Identifying your age, gender, location, from your Web surfing

– Automated fraud detection

• **Digital Cameras**

– Automated face detection and focusing

• **Computer Games**

– Intelligent characters/agents

Future Work:

In this section, we discuss some of the open questions in intelligent tutoring systems research. In general, many of these questions fall into two categories: (1) reducing the time and cost of development and (2) allowing students to work collaboratively.

Reducing development time and cost:

One of the main difficulties in designing intelligent tutoring systems is the time and cost required. A large team, including computer programmers, domain experts, and educational theorists, is needed to create just one. Estimates of construction time indicate that 100 hours of development translates into 1 hour of instruction. Clearly there is a need for techniques that will help alleviate these difficulties for instructional development.

Authoring tools: The goal of authoring tools is to provide a (relatively) simple development Environment and as a result, fewer developers would be needed for the construction of educational software. There are two main approaches to achieving this goal: (1) provide a simple development shell for educators to author their own courseware and (2) provide a means for programmers to more easily represent the domain and teaching strategies.

3.   NEW CONCEPT OF INTELLIGENT E-LEARNING SYSTEMS

The new concept involves e-learning systems which use artificial intelligence methods and are equipped with intelligent two-way communication between the e-learning system and the user .According to the new concept, the e-learning system contains intelligent methods for analysis, evaluation and assessment of the user's knowledge and skills as well as e-learning process control, supervision and optimization. The complete intelligent e-learning system through hybrid artificial neural networks is equipped with an intelligent two way communication system. The communication system by input a natural language between the intelligent e-learning system and its users consists of intelligent mechanisms user identification, word and sentence recognition, sentence meaning analysis, and user reaction assessment. The intelligent e-learning system can be developed for personal computers as well as various mobile technology devices.

The advantages of intelligent e-learning systems using intelligent two-way communication input a natural language between the e-learning system and the user include the following:

– More robustness against user's errors and more efficient realization, control, supervision and optimization of the e-learning process with the chosen level of supervision automation.

– Improvement of the co-operation between a user and an e-learning system in respect to the richness of communication.

– Achievement of a higher level of organization of a distance learning process.

– E-learning decision and optimization systems can be remote elements with regard to an e-learning system.

The letters grouped in segments are then processed by the word analysis module. The analyzed word segments are inputs of the evolvable fuzzy neural network for recognizing words. The network uses a training file containing also words and is trained to recognize words as sentence components, with words represented by output. In the next stage, the recognized words are transferred to the sentence syntax analysis module which uses sentence segment patterns. It analyses and divides sentences into segments with regards to meaning, and codes sentences as vectors. They are sent to the sentence segment analysis module using neural networks equipped with sentence segment patterns. The sentence becomes inputs of the sentence recognition module.

Fig. 2 Concept of an intelligent e-learning system
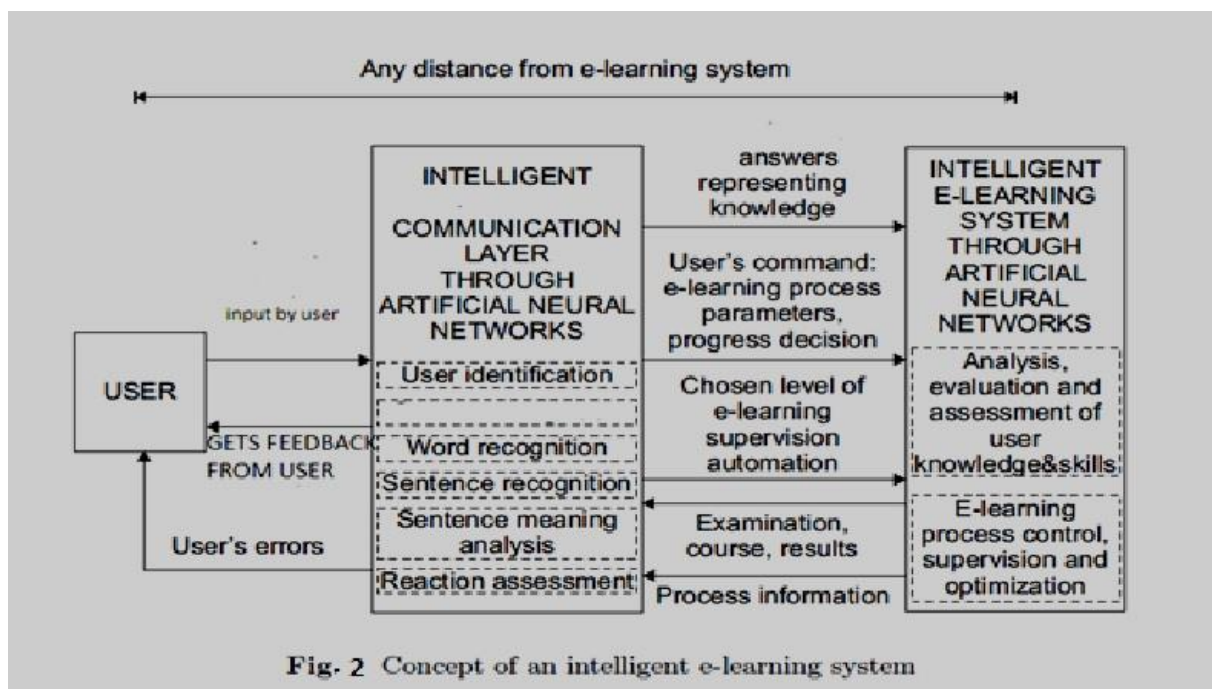
4. MOTIVATION

Computers are fundamentally well suited to performing mechanical computations, using fixed programmed rules. This allows artificial machines to perform simple tasks efficiently and reliably. For more complex problems, things get more difficult. Unlike humans, computers have trouble understanding specific situations, and adapting to new situations. Artificial Intelligence aims to improve machine behavior in such complex tasks.

5. CONCLUSION

It is for this reason that major simultaneously in which these technologies are evolving with the use of artificial intelligence, likewise evolve our society. Artificial Intelligence is a science that causes greater impact , machine learning , resulting important the process of making intelligent behaviors , a system to improve its behavior on the basis of the experience through the process of repetitive tasks and also have a notion of what is wrong and you can avoid it, is very interesting .

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