The Utilization of Artificial Intelligence Technologies in the Domain of Electronic data Engineering

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Abstract

In the development of artificial intelligence, electronic information engineering technology plays a crucial role. The support provided by this technology is vital for advancing artificial intelligence applications. This paper explores the key concepts of artificial intelligence and electronic information engineering, and examines the implementation of artificial intelligence technology within the electronic information engineering platform. The analysis reveals that the system does not have any critical vulnerabilities, achieving a data transmission success rate of over 80%, with a response time of under 3 seconds, thus fulfilling the established requirements.

Keywords: Artificial Intelligence, Electronic Information Engineering, Information Industry, Platform Design

1. Introduction

Artificial intelligence is also getting closer to being human. The technology of artificial intelligence is now maturing more and more, getting ready for gradual use in the field of higher education. The dawn of the 21st century has seen a continuous emergence of cutting-edge, popular yet convenient technologies. Among these gems, artificial intelligence has infiltrated all walks of life at a speed that could not be imagined. Current applications include well-known speech recognition, system positioning, intelligent public transportation, etc. [1]. The last two decades have witnessed drastic changes in the way companies deal with suppliers and customers in information technology. The technology allows sharing information, like point-of-sale data, inventory, forecasts, or sales trends, very quickly and at less cost. For example, among the most famous is Wal Mart's retail link program, an information-sharing program that provides suppliers with point-of-sale data [2]. Also, because of the competitive changes and changing socio-economic environment with demand diversity and shortening of the product life cycle, product demand has become less predictable. For example, a mobile game is usually replaced by a new hot topic in one or two years. It is becoming more and more important for platform and software suppliers such as Sharp, Jinli, and TCL to closely follow and predict users' needs. On the other hand, within the framework of large data and in particular in the sphere of smart Internet products such as mobile phones, it is stated that mobile Internet, face recognition, mobile positioning, social media, and other functions are widely integrated. Prediction of behaviors can be based on the wishes and interactions of end-users, yet developing and utilizing the information market is a chance and challenge to existing enterprises [3]. Additionally, keeping the information as private as possible is becoming increasingly trepid for the software and platform providers to give up on each other while prioritizing their evident advantages over the other. But beyond that, each of them will go out to impute self-benefits. Sharing valuable private data for individual businesses can result in loss of power over such data, and afterwards the companies are extremely cautious about sharing information further along their supply chain [4].

The structural study of the electronic-informational engineering process in regards to Artificial Intelligence has been thoroughly done in this work. This means describing the transition and evolution of the electronic-informational engineering in a totally newer perspective; this creates the rational platform for further tuning and re-optimization of electronic-informational engineering under Chinese standards; this too gives a vision to the electronic-informational engineering of the future from the perspective of Artificial Intelligence and frames the references for electronic-informational engineering considering its present parameters, thus formulating feasible

ideas from various aspects concerning the upcoming AI era's possibilities. The vision for the development trend and optimization of electronic information engineering advanced from the AI-level suggestions contain cross-disciplinary contributions for the arrival of the artificial intelligence epoch, a look in analyzing the probable turf of electronic information engineering against the backdrop of artificial intelligence, and an excursion in probing the internal logical relationship framework of electronic-informational engineering and artificial intelligence so as to give reasonable recommendations for the tinkering of electronic-informational engineering.

1.1. Concept of Artificial Intelligence

Even those definitions from the '80s are basically reflections of the ideological content of artificial intelligence. First, the object of AI research is human activity, on the basis of which we can identify general rules. Secondly, guided by the idea of such rules, a computer-based system is designed and developed to help carry out intelligent work. In a nutshell, this is about building an intelligent system out of computer equipment to imitate human intelligent behavior, to find out the general premises, and to substitute for some aspects of human labor. Today, a legion of scientific research workers is dealing with artificial intelligence research and application, which state such an enhanced benchmark and dimension for AI to keep humankind from being shackled with productivity and production relations and thus actualize the broader release for humans. "Be it the early definitions of artificial intelligence or the more recent ones, there is this common point that aims at learning human ways of thinking to help set humankind free from monotonous and repetitive labor." Hence, artificial intelligence means making use of computer algorithms to analyze an existent knowledge used by human beings, realizing the growth of reasoning, learning cognition, and analytical abilities, so as to substitute partly for human labor technology.

1.2. Characteristics of Artificial Intelligence

From the perspective of the human mind, this is a system intended for humanity. Artificial intelligence is a computer-based hardware system programmed by humans with certain logic and algorithm rules to operate. It has been made to serve rather than dominate mankind. By a human design, it is capable of sensing its surrounding environment and generating appropriate response behavior. It can communicate with humans. AI systems are to be built so that they can sense the information of the environment through five modalities: vision, audition, olfaction, touch, and taste-and therefore can reply back to the outer world through language, words, expressions, and actions [6]. It is adaptable, learning, evolving, and interconnected. An artificial intelligence system should learn and adapt to the environment-situated processes. Endowed with the ability to adjust its parameters, data, or tasks dynamically depending on a dynamic aspect of the environment.

1.3. Current AI Technologies

Artificial intelligence is a science and technology concerned with extending and enhancing human intelligence, mainly through the machine simulation of human modes of thought and learning, such as speech recognition, deep learning, emotion analysis, learning analysis and intelligent behavior, which enables the machine to think and behave like a human and ultimately perform tasks thought to be exclusively a human domain. Towards the end of the last century, computer scientists introduced the term "singularity." They climbed to a theoretical point to posit that computers or robots employing artificial intelligence systems can evolve themselves recursively to generate more advanced artificial intelligence systems to live with them. When it comes to artificial intelligence, one cannot underestimate its impact upon us versus the convenience it brings to our doing things in life and work. AI has been on fast track development and widely used in family life, health care, transportation and other arenas; all industries are actively exploring ways to use AI technology in order to tackle their industry problems, education being no exception. AI can be said to be, according to peers within China's academia, a kind of technique that can increase, use, and confer abilities. There are two forms of interpretation: that of augmentation and assistant, applied in teaching [7].

1.4. Agent-Based Technologies

(1) Concept of agent technology

The basic idea per se for an agent could be completing certain goals and tasks by packaging the environment, which can provide a transition from actively searching and acquiring information to recursively visiting the needed information. The agent approach expects to enter into the world of computer teaching, which brings a new conceptual foundation and the possibility for intelligent computer-aided teaching. The agent has been defined as a software entity, which can act on behalf of the user or other programs to execute desired operations within a

given range [8].

(2) Operation of agent technology

Agent technology possesses autonomy, with which it can be able to control its own state or actions such that it can effectuate the operation by itself; Sociality, where it can interact with other agents or entities by means of specific methods; usability, being capable of observing real-time alteration of its environment; persistence, where it lives on and is capable of continuing; reasoning/planning, being able to analyze the current state of things and enact rational planning; mobility, being able to traverse in one's environment; and learning, where it accumulates learning over time, whereas, through experience, one transforms future behavior. The system of teaching with the application of agents uses the database of related knowledge and wisdom, builds teacher and student models, collects students' feedback actively, satisfies their learning needs, processes learning through teaching data on its own, and sets up learning plans on the basis of data, continuing to modify and define interactivity [9].

1.5 CAN Bus Protocol

CAN stands for Controller Area Network. It is a new design of communication network developed to solve the problem of measurement in the field of the auto industry; it is the acronym for Automatic Serial Controller Area Network. In other words, the car serial bus control LAN. Presently a lot of vehicles all over the world are fitted with CAN bus technology. The technology has reached advanced development, thus being carried out throughout various other fields of industry. Now its application has spread beyond the automobile industry into the textile industry, mining, metal fabrication, pharmaceuticals, medical device manufacturing, sensors, and many other areas. Can Bus has become an international standard, generally accepted as one of the most important and promising field buses [10].

1.6 *Architectural Framework for Databases*

Based on the developments in information technology, system engineering principles, and mathematics, the tendency of people towards the quantification of the management process and to use computers for the attainment of scientific management of information engineering projects with each passing day. The data management system of the present cannot exclude the influence of computer technology. In the past, the computer system was not working for the purpose of sharing resources and data, but rather for accomplishing only some simple processing tasks and in a very bulky machine, with the main processing machine placed in a separate room. Later on, batch systems and time-sharing systems were introduced, which provided increased functionality and performance for computer systems, but it was done by the acceptance of terminal devices by a host. By the onset of computer network technology and the development of communication and networking technology, remote computer networking came to development. The computers in trying to perform the purpose of transmitting and sharing information must be able to connect computers from different geographical regions to a central one through communication technology. With computer networking technology growing bigger and bigger, the computing modes went from centralized processing mode to the client/server mode. In a simple terms: centralized processing structure in one little place still kept being converted into a client/server. In a gathering of clients, server machines, and database machines (three-tier C/S), the clients always handled GUI management. This network development and the widespread application of network technology together form, in the Web technology framework, the integrated architecture of B/S.

1.7 Relevant Calculation Formula

Weighted average algorithm:

Average error algorithm: Repeated sampling:

$$x = \frac{\sum xf}{\sum f} \quad (1)$$

$$\mu_x = \frac{\sigma}{\sqrt{n}} \quad (2)$$

$$\mu_y = \sqrt{\frac{p(1-p)}{n}} \quad (1)$$

Non repeated sampling:

$$\mu_x = \sqrt{\frac{\sigma^2}{n}\left(1-\frac{n}{N}\right)} \quad (2)$$

2. Application of Artificial Intelligence Technology in Electronic Information Engineering

2.1. Function Introduction:

(1) ISA communication interface unit

It provides for interaction between DSP data and PC data and transmission of the control signals. The communication in ISA is performed using IO port access, not memory mapping.

(2) PC processing unit

It is responsible for the further processing of DSP data, as well as different operations that can be performed by the master controller.

(3) Experimental interface

It provides functionalities for human-computer interaction. It both displays the DSP results of processing, data into and back out, and stores them. This is also the area of functional control for experimenters who will perform various operations during their experiments. Can operate the hardware of DSP processing board, set relevant parameters according to experimental requirements, control the experimental interface itself, display scale, dynamic, static and so on

Support software: It can modify the application program of DSP on the PC arbitrarily or carry out further software developments when needed without operating the hardware of the processing board. This way realizes the multi-function of the system

1.4. The Construction of the Performance Evaluation Index System

Performance index as CAN bus communication network has been discussed here as a chosen case. The construction of a performance evaluation index system must adhere to the following principles

Comprehensiveness: the selected measurement indicators need not be many but should be as comprehensive as possible

Independence: the correlation of the selected measurement indicators should be as small as possible, or even irrelevant

Clarity: the meaning of factors must be clear

Measurability: the selected measurement index should be easy to measure, which can be considered as the operability of the specific implementation of factors

Quantifiable: that which is suitable for calculation and simulation.

1.3. Evaluation Coefficient

Table 1. Evaluation Coefficient Tables

	A	B	C	D	E	Rating Gross	Fi(%) of functional evaluation coefficients
Power suppl	4	4	3	4	3	18	3.6
RF segment	5	6	6	5	5	27	5.4
Optical Module Work	82	81	82	82	83	410	82.0

4.2. Bug Detection

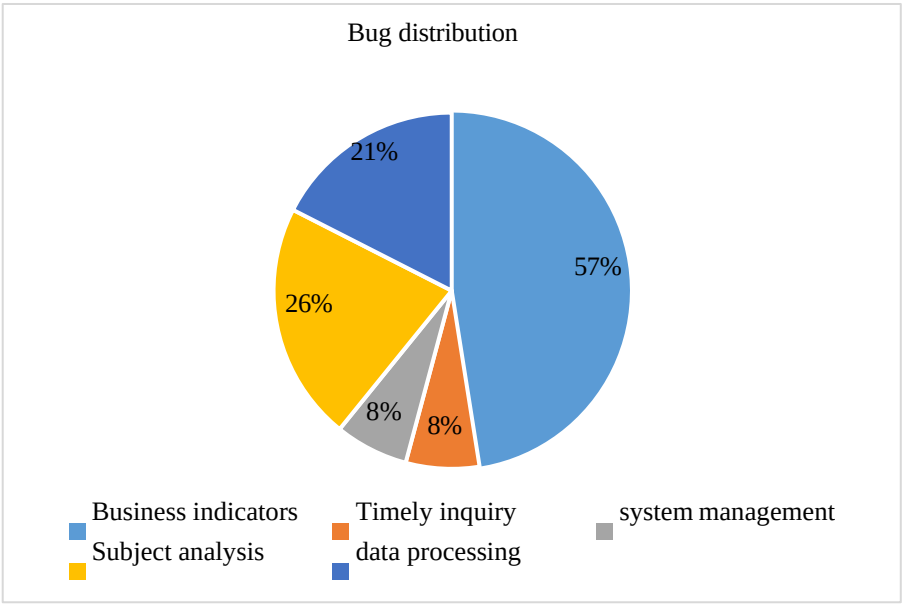

Figure 1. Distribution of Bugs

During functional testing, 107 tests were designed, 105 were executed, and 93 bugs were discovered, of which 97.1% were Minor and Generic in nature, with no severe bugs. All bugs have now been fixed and closed. A total of 30 test cases were designed for the Accuracy test, with 30 test cases carried out, and 41 bugs discovered, which were all Moderate and Generic, with no Fatal bugs. All bugs have been fixed and closed. The system function meets the user's requirements.

4.3. Data Transmission Success Rate Test

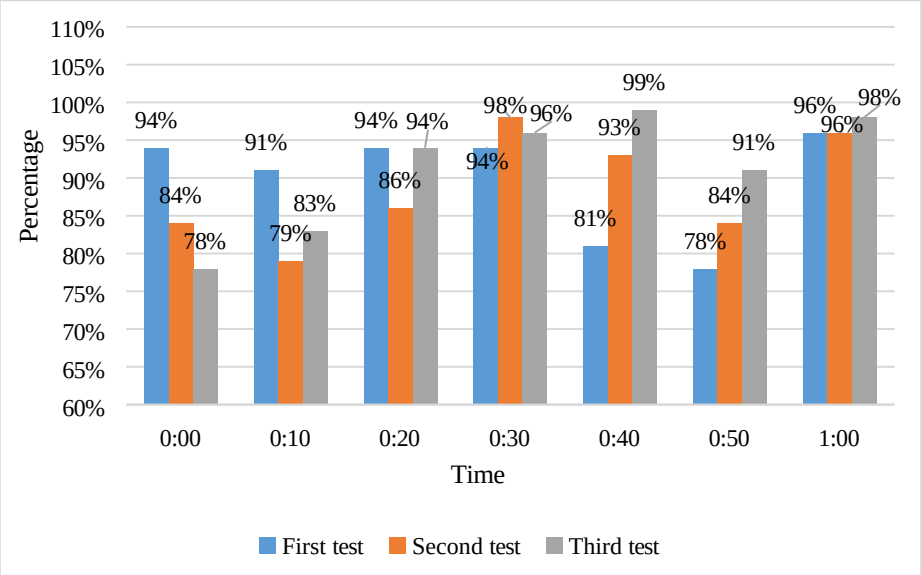

Figure 2. Platform Transmission Success Rate Test

According to figure 1, in the data transmission success rate test project of the platform, after three rounds of tests, each test time is one minute, the transmission success rate basically meets the demand of more than 80%.

4.4. Response Time Test

Table 2. Response Time Test

	One person	Ten people	Twenty people
First test	1.3	2.1	3.2
Second test	1.2	1.8	3.1
Third test	1.4	2	2.9

2. In response to testing, the system functions well in meeting the day-to-day requirements. Next is the response time. As can be seen in table 2, a response time of 1.3 seconds is observed for 1 person, 2.1 seconds for 10 people, and 3.2 seconds for 20 people in the first test. The time results in the second and third tests were consistent, with the response times being less than 3 seconds-a requirement that had been set.

Conclusion

At the moment, electronic information technology is developing so fast. This paper makes explicit the merits of artificial intelligence technology-parallel to the clear explication of disadvantages of electronic information technology, being optimized and upgraded using artificial intelligence technology to development-of both communicate to reasonable and scientific. Further, in our coming work, we still need to augment the AI research to benefit more people. The

treatment in this paper is towards the definitions of electronic information technology and artificial intelligence technology. The experimental tests showed that the system satisfied the real exigencies and met the desired specifications fairly well.

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