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Abstract. It aims to introduce the cognition and understanding of smart code and how to achieve formal reuse from different perspectives. The methods are: 1. The inventor's cognition and understanding of the smart code; 2. The cognition and understanding of the smart code reused by scholars; 3. AI's cognitive calculation and formal understanding of the smart code reused by anyone. It is characterized in that it not only reviews and summarizes people's cognition and understanding of smart codes in a point-by-point manner, but also attempts AI's cognitive computing and formalized understanding of smart code reused by anyone. The smart smart code technology platform consists of three parts: smart code recognition system, character smart code digital semantic translation system, and Chinese character data storage and dissemination system, each of which has its own specific structure, attributes and functions. As a result, not only have different perspectives on the cognition and understanding of smart-code reused by individuals, families, enterprises and institutions, and the government, etc., but also explored and demonstrated the multiple cognition and understanding of smart-code reused by human-machine combination smart system. Its significance is that it not only opens up a new direction of human cognition and understanding of smart-code, but also opens up for AI's cognitive computing and formal understanding of the smart-code reused by anyone.

Keywords: Smart Code Recognition System, Chinese Character TuCode, Semantic Translation System, increase efficiency Storage and Dissemination System, Cognitive Computing, Formal Understanding, Human-Machine Combination, Smart System, Smart-Code Reused.

1 Introduction

It aims to introduce the cognition and understanding of smart code and how to achieve formal reuse from different perspectives.

TuCode information operation system and its necessary background: After combining the TuCode product, code reading software, and the multiple hardware systems, they are installed in the same or different types of application scene systems, forming a closed loop of information in and out, becoming a complete application solution can be integrated into the entire information operation world, and is related to

the micro-chain information system of the Internet and the Internet of Things. In the TuCode application system, each single product of TuCode application is an independent information micro-chain system, and several TuCode micro-chain systems constitute a giant "TuCode network". There is a lot of cognitive computing and systems analysis involved. Automation technology and human-machine interaction and even collaboration are needed.

2 Method

The methods are: 1. The inventor's cognition and understanding of the smart code; 2. The cognition and understanding of the smart code reused by scholars; 3. AI's cognitive calculation and formal understanding of the smart code reused by anyone. It is characterized in that it not only reviews and summarizes people's cognition and understanding of smart codes in a point-by-point manner, but also attempts AI's cognitive computing and formalized understanding of smart code reused by anyone.

2.1 The inventor's cognition and understanding of the smart code

The inventor's cognition and understanding of the TuCode production platform contains three aspects, namely: TuCode recognition system, character TuCode digital semantic translation system, and Chinese character data storage and dissemination system, each of which has its own specific structure, attributes and functions.

Table 1. Levels, key points and entrances of smart code system optimization.

Optimization level	Smart systems need to be upgraded	Good entry point
Optimization Begins	The smart code technology platform	Upgraded Smart Code
First optimization	The smart code recognition system	Personal data entry
Second optimization	The digital semantic translation system	Co - Intelligence
Third optimization	The data storage and dissemination system	Intelligent matching
Typical application	The customized personal data management	Persons/Organization

Zou's fundamental law of information (Three types of information relation identities) governing the system optimization of smart code technology platforms:

$$I_k + I_u = I_d \quad (1)$$

It can be seen from the above information identities that the basic relationship between knowledge information, known information data, and semantic information, unknown information data, belongs to the identity relationship between local data information and overall data information. Its typical application has long been proved by the twin Turing machine and its formal method and indirect calculation model (see Fig. 1).

That is to say, the combination of the leading scientific discoveries of scholars with first-line practical experience and the inventions and creations of technology-born entrepreneurs' graphic structure Coding technology and its platform is the reason why we, as the co-authors of this article, have an opportunity to discuss the upcoming Hengqin conference. The 1st International Conference on Cognitive Computing and Systems and its supporting Industrial Demonstration Project Meeting.

Therefore, this paper integrates the latest scientific discoveries and the results of interpersonal cognition in the market of cutting-edge technology products, that also attempts to make targeted batch (automation) technological innovations through human-computer interaction and collaboration, and then to the cognitive computing system network, strive to bring all kinds of academic and industrial counterparts to bring a refreshing feeling.

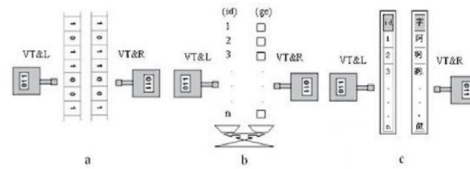


Fig. 1. Zou's Twin Turing Machine and Its Formal Method and Indirect Computation Model.

It can be seen from Figure 1 that Xiaohui Zou's twin Turing machine and its formal method and indirect calculation model, as well as its potential in data processing, generalized bilingual information processing and Chinese information processing.[1]

2.2 The Early Achievements of Graphic Structure Coding Technology

One-dimensional digital graphic code information technology [2] and a seal with built-in information graphic code and its application system [3] The two technologies are one of the co-authors of this article, Tongchao Wang and his company, in the form of patent specifications. Publicly available Picture Coding technologies (with the exception of proprietary technologies).

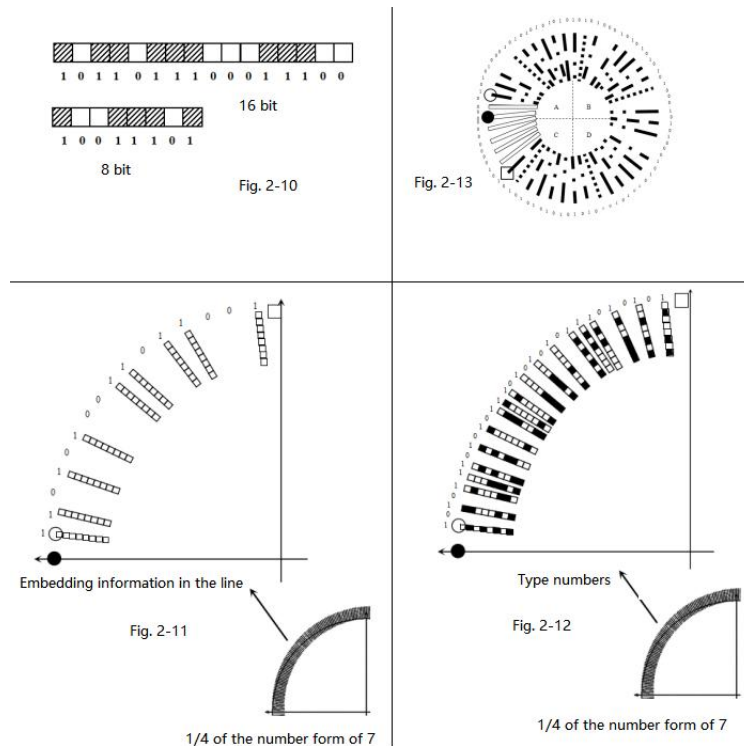


Fig. 2. One-dimensional digital graphic code key information technology.

It can be seen from Figure 2 that there are several key links in one-dimensional digital graphic code information technology. Its principle comes from "Graphic Models of Dynamic Geometry and Numbers: TuCode Technology" [4]

In the book, it is not proposed to use two-dimensional code technology to inject information into one-dimensional digital patterns to construct digital graphic codes; in existing bar-code and two-dimensional code products, it is not used. One-dimensional digital patterns and their mapping methods are used to store and interpret information, but no relevant patents have been retrieved in the relevant documents of the Patent Office, and there are no one-dimensional digital graphics codes in the market and products used by users. The patent includes the product structure style, generation and application methods of one-dimensional digital graphic codes.

The functional advantages of using digital graphics code:

(1) Use integers to edit, query, and call the corresponding TuCodes, so that the TuCodes and numbers can be seamlessly connected, and the series of TuCodes can be combined in an integer sequence to achieve precise matching of numbers and shapes. This is convenient for the user and the machine to directly call and process the information in the TuCode in a digital way, with fast speed and high efficiency; (2) According to the amount of information, the machine can automatically select the corresponding digital form to store, so as to achieve precise selection and save money.

Memory resources, reduce waste and work energy consumption; (3) Expand the function and usage of TuCode information, expand the scope of use of digital TuCode, and facilitate the upgrading of TuCode information technology; The dimensional graphic code has a unified generation standard and interpretation scheme, which is easy to manage.

The principle of coding and decoding: The basic information of the computer "0", "1" bit stream is implanted into a straight line segment or its line system with a certain width. The method is: the point that constitutes the straight line segment is a designated area, which can be a square whose pixel area is proportional to the scale. In order to make such a point in the straight line segment, that is, the square corresponding to the "0, 1" bit stream of the computer, software control is used to control it. The dots representing "0" are squares, which are not displayed and printed; the dots representing "1" are squares, which are displayed and printed. As a result, in the formed pattern, the geometric distribution of space and solid or black and white corresponds to the basic logic code of the computer. The geometric code of information is stored in such a pattern code, which can be used to focus and snapshots. The machine automatically interprets the information.

The overall feature of the one-dimensional digital graphic code is a circular structure, and all one-dimensional straight line segments are arranged in a circle, which changes the single block structure of the two-dimensional code and breaks through the current two-dimensional code that is always vertical and horizontal. way to store information. Moreover, the circular overall structure has large space, large storage capacity, rich structure, high degree of freedom, and can realize multi-level storage. This enhances and expands the TuCode information technology.

Design and application of one-dimensional digital graphic code structure:

After the digital form is standardized and embedded with information, it becomes a TuCode, and the information stored in it can be interpreted. The digital figure is the master and information carrier of this information figure, and the main information line of the loaded information is a one-dimensional straight line segment in the digital figure.

The digit form of a selected number must be standardized in the "coder" before the information is implanted. Setting method: Determine the number-shaped circle through the software, so that the whole number-shaped circle is contained in the circle, and the circumference is always along the outermost end of the one-dimensional straight line segment. Therefore, the rectangular coordinates are set at the center of the circle, and the coordinates divide the digital circle structure into four areas: the upper left area, the lower left area, the upper right area, and the lower right area; The intersection of the horizontal axis, the intersection of the upper vertical axis, and the intersection of the lower vertical axis. Digital circles, coordinates, and intersections used for standardized settings are generally not displayed or printed in one-dimensional digital graphic code products to avoid influence on the interpretation of graphic code information. Numerical shapes have standardized partitions, which greatly facilitates information implantation, management and accurate interpretation.

Three marks are set in the one-dimensional digital graphic code pattern: positioning mark, starting mark and ending mark, abbreviated as: positioning point,

starting point and end point. There are three types of position changes: three marks coincidence, two marks coincide, The three signs do not overlap.

Numerical graphs are graphs that correspond one-to-one with the natural integer system; each pattern consists of several lines, of which the lines of the numeric shape are straight line segments, which are generated under the control of computer software, and are gradually constructed from a one-dimensional straight line segment, according to the "integer shape" drawing rules, until the geometric figure is complete, it forms a circular arrangement, and the overall configuration is generally a circle. Computer bits can be embedded in each line segment for the reader to interpret. Therefore, the digital graphic code structure is a one-dimensional digital pattern with an integer unique structural pattern.

Information implantation method:

(1) Online information implantation, that is, geometric coding. (2) Information implantation in the line system. Details are shown in several series in Figure 2, respectively. In the one-dimensional digital graphic code, the information is formed according to the number, and the information is implanted in a clockwise direction. The maximum amount of information stored is from the starting position and the ending position, in a 360° cycle; the maximum read amount is when the TuCode is generated. , when the starting point coincides with the end point; the information storage capacity is proportional to the radius of the circular graphic, the number of memory levels and the amount of internal storage units.

One-dimensional digital graphic code is suitable for the application field of current two-dimensional code, as well as other information storage, information association and circulation links. It provides important technical and product support for the upgrading and operation of the entire TuCode information technology industry, and has a very broad application prospect.

2.3 Smart Code Cognitive Application Technology Platform

(Combined with market development needs) Smart code technology is a continuous iterative upgrade of one-dimensional digital graphic code information technology.

2.3.1. Smart Code Cognitive Application Technology Platform

This is an operation platform that accurately calls and transmits all knowledge and cognitive systems through smart TuCodes. It is suitable for people and machines, and between machines and machines. It is universal online and offline, and can be integrated across platforms. The operation, in addition, has the characteristics of safety and reliability, low energy consumption, wide range of users and low cost of use. The platform is convenient to be widely used on existing software and hardware devices.[5][6][7][8][9][10]

2.3.2. TuCode factory, that is, TuCode custom production (creation) platform

This is the production work platform of the TuCode. It is currently embedded in the TuCode network to operate, and it is specially designed for customers or machines to customize various special TuCodes required for production. At present, the production capacity reaches one qualified code every 200 microseconds, which can be produced continuously for 2000 years. This is the first batch of code libraries that can

serve a wide range of customers. Due to the non-linear structure of the TuCode, it is rich in styles and categories, meeting the customization needs of users in various industries.[11][12][13]

For special-purpose TuCodes, an independent code library can be opened, and the production interface can be opened for customers to use.[14][15][16][17]

2.3.3. TuCode security identification system

All TuCodes are equipped with special authentication and interpretation keys according to their structural characteristics to ensure correct identification and interpretation security. It can be recognized and interpreted in both online and offline environments, and it can also be recognized and interpreted under the conditions of networking and disconnection.

2.3.4. The digital semantic translation system in the text TuCode

Text TuCode is a very important applicable product. The platform uses data translation for the corresponding knowledge semantics and entry settings in the text TuCode. The content is retrieved from the knowledge database, and translated into human, machine-readable and recognizable content. For human-machine sharing. This system enables all knowledge to be conveniently operated and transmitted through the map code.

2.3.5. Character or Chinese character data storage and dissemination system

The TuCode enables each individual character, pattern, especially Chinese character, to have the ability to store and disseminate information data twice, and does not require the user's traffic cost. This gain in the ability to store information gives the text more information. quantity at no cost.

Text and TuCodes are universal carriers of information flow between people, people and machines, and machines and machines. This promotes the text to a wider application scene in the new era.

This platform system is a commonly used information communication tool in a society where humans and robots live together, and it is also a new era of Chinese character development and application![18][19][20][21][22]

We let robots learn human knowledge, let robots quickly train robots to learn and do things, let robots teach people, and change the education status quo that senior teachers are not enough.

3 Result

The popularization of the above systems is also the popularization of knowledge methods for robots to read, literate and communicate. Robots will appear in a self-organized society, and the era of coexistence with human beings will emerge. Behavior. The new development of human intelligence has improved the working environment and field of activity for robots to do things that humans cannot do.

The result not only have different perspectives on the cognition and understanding of smart-code reused by individuals, families, enterprises and institutions, and the government, etc., but also explore and demonstrate the multiple cognition and understanding of smart-code reused by human-machine combination smart system.

The smart code technology platform consists of three parts: smart code recognition system, character smart code digital semantic translation system, and Chinese character data storage and dissemination system, each of which has its own specific structure, attributes and functions-These three points have been introduced in the previous method section. The following structural section will further elaborate on the advantages and practical effects of this technology based on feedback from practical experience.

Smart code technology advantages: a. Completely solve the identity problem of the code, the code has a destination, the host is the owner of the code, and the owner is the source of the code's identity. Registering the platform and solving the identity source is the basis of the code. You can "multiple codes for one master". The host of the code and the solution to the identity problem, including: the property rights of the code and who it does things for and who it serves, can define and develop a private code era. b. In addition to the fact that the smart code stores all the information data on the geometric structure, and the appearance is colorful, it is important to use the coding key to have direct control and traceability of each code, which is determined by the attributes of the smart code itself. Nothing to do with other things. In the custom and randomly generated code products, it has the ability to directly trace and control the code product itself, and can reliably use the code to trace the product information and the content of the code. This completely solves the problem that the current code matching itself cannot be traced, and improves the direct management ability of the code matching. The current code is verified by the information in the code, but the code can be generated anywhere, and there is no management ability!c. Completely solve the huge demand problem of special personality codes for people or things, and can give each object special information codes appliances, and realize the production platform for artistic creation of code products. The production speed is currently 200 microseconds for a new product.d. In addition to the above differences, the information in the smart code will not be arbitrarily changed or counterfeited by the outside world or others; only the owner or agent of the code can use the key to open the information in the change code. This is an upgraded security information code, which is a micro-blockchain. This is not possible with current QR codes. e. It is completely solved in terms of user operation technology. For several customized codes with different personalities, diversity codes are used in the security management of the whole process. At the same time, according to user needs, the map code can be freely switched between "general code and restricted code". Common is multiple codes and different identity codes, allowing the public to read information freely. You can also convert the readable code into a "restriction code", and only users within the specified authority can decode the information. "My code, I call the shots", the security control is in place, and the smart code is used to maintain the safe transmission and confidentiality of information. f. Completely prevent the long-term control and immutability of the associated information in the customized smart code, the specific unique identity of the customized code, the long-term or lifetime control of the information content, storage, and modification of the code, others cannot intervene, and have the right to choose the transmission method of the code, Determine where opcodes are used and where the system is created.

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