Design of Online Teaching Mode Recognition System for Ideological and Political Curriculum Based on Hash Algorithm

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Abstract. In the practical application process, there are many defects in the online teaching of ideological and political courses, leading to the inability to accurately identify the teaching content. In order to avoid this situation, this paper designs and analyzes the ideological and political course online teaching mode recognition system based on the hash algorithm. In the system hardware section, Design main control circuit and PCB board of teaching mode identification system; In the software part, the teaching recognition function module adopts hash algorithm, designs the multi-core recognition database under the hash algorithm, and then completes the design process of the ideological and political course online teaching pattern recognition system. The final test results show that the recognition rate of the designed system is high, which is more than 90%, indicating that its recognition effect is good, has strong stability and certain practical significance.

Keywords: Hash algorithm · Ideological and political courses · Online teaching · Teaching mode · Online teaching recognition · System design

1 Introduction

Under the new situation, in response to the national call of "continuous suspension of classes", universities across the country will make full use of network technology to build an online teaching platform, and the curriculum education has been fully completed online. In just a few months, teachers have experienced the rapid growth stage of online teaching from basically completing online teaching tasks, to the ability of online teaching to actively redesign courses [1]. During this period, it is worth noting is that in the daily teaching activities, most professional teachers combined with current affairs in the course, ideological and political exploration, did in the mission at the same time, combined with the real case in the society, encourage and guide graduate students advocate science, patriotic family, perfect practice of the trinity education concept, for "ideological" education background opened new ideas, expand the new path [2]. In fact, the concept of integrating ideological and political education into professional curriculum education has a long history, which can further strengthen and improve the effect

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of ideological and political education for college students [3]. Online ideological and political education should be run through the talent training system, comprehensively promote the ideological and political construction of diversified courses in colleges and universities, give full play to the educational role of each course, and take it as an important guideline to improve the quality of talent training in colleges and universities, highlighting the fact that the Party and the state attach great importance to this work.But online courses: Ideological and political courses and ordinary ideological and political courses are two different concepts. Ideological and politics of online courses refers to the comprehensive education concept of combining all kinds of courses and ideological and political theory courses in the form of building a full, whole and whole political education pattern, to form a synergistic effect and take "cultivating people through virtue" as the fundamental task of education. Ideological and political online courses emphasize the integration and combination of ideological and political elements as implicit education [4]. Therefore, it is very necessary to establish the main battlefield and ideological and political promotion path of online and offline classes, and establish a scientific and reasonable curriculum. It has become an urgent topic to be solved and improved in the training of college students in China, which has irreplaceable value to improving the quality of talent training.

Different teaching modes also have certain differences in the effect of different teaching, and have great purpose and initiative. However, college students' understanding of ideological and political courses is relatively more relaxed, mainly because after this stage of learning, it has a certain basic knowledge reserve, and has a certain purpose and initiative to engage in scientific research, so it is very different compared with other students when choosing its online training mode. Moreover, the identification of teaching modes in ideological and political courses is usually related, and will have a great impact on the final teaching results. Teaching identification is mainly to sort out and summarize some problems and hot topics in the course, and combine with their own integration, to create a new extended teaching mode.

In recent years, many scholars have analyzed and studied pattern recognition methods. For example, Gao y et al. Proposed a pattern recognition algorithm based on container theory, which summarized the requirements of pattern classification into two different categories: one is the comparison and matching of input-output sequences, and the other is discrete data structure to realize effective pattern recognition [5]; Wang h et al. Designed a flatness pattern recognition method based on Legendre polynomial, which makes full use of the adaptive feature learning ability of deep learning network to complete the recognition of working pattern. Although the above scholars have studied the pattern recognition methods, they are not aimed at the teaching field, resulting in poor effect in the pattern recognition process of Ideological and political courses [6].

Hash algorithm is a more comprehensive and systematic calculation method, also known as hash. It mainly inputs data of any length into fixed length output through hash algorithm, and the output value is hash value [7]. In the calculation process, it is very strict and has almost no error. Therefore, it is widely used in the creation and adjustment of online teaching recognition system. Therefore, in order to solve the problems of the above methods, this paper designs an online teaching pattern recognition system based on hash algorithm. In the hardware part of the system, the main control circuit and PCB

board of the teaching pattern recognition system are designed; In the software part, the teaching recognition function module adopts the hash algorithm, and designs the multi-core recognition database under the hash algorithm. Here, complete the design process of the ideological and political course online teaching pattern recognition system, in order to provide some help to improve the pattern recognition effect of the ideological and political course.

2 Hardware Design of Online Teaching Mode Recognition System in Ideological and Political Courses

2.1 Main Control Circuit Design of the Teaching Mode Recognition System

It is necessary to design the hardware of the online teaching mode recognition system of ideological and political courses. In the design process, the master control circuit needs to be designed first. The main contol circuit is mainly composed of microcontroller, infrared thermo electric detection circuit, luminance detection circuit, DALI interface circuit, wireless communication module, code dial switch and knob circuit, power supply circuit, etc. The block diagram of the system hardware is shown in Fig. 1:

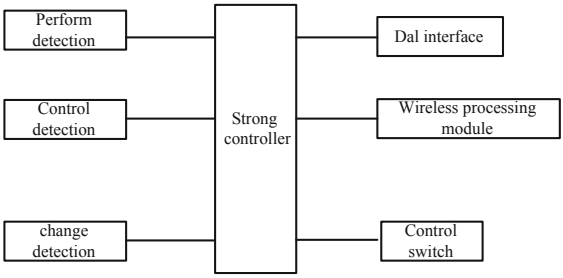

Fig. 1. Composition block diagram of main control system

After completing the design of the system hardware composition block diagram described above, next, the main control system DALI bus is required to supply the DC voltage, the working voltage of the microcontroller PIC16F884 is 5 V, and the working voltage of the wireless transceiver module RF905SE is 3.1−3.6 V, so the multi-stage DC-DC transformation needs to be designed. The first stage DC-DC transformation transforms the power supply voltage 25 V to 12 V through the three-end voltage stabilizer L7812, the second stage DC-DC transformation transforms the 12 V voltage to 5 V by L7805, and the third stage DC-DC transformation transforms 5 V to 3.3 V through LM317. The high-frequency filter capacitances C4, C5, C18, and C10 are selected as 0.1 uF, and the low-frequency filter capacitances C11, C12, and C19 are selected as 47 uF. According to the design of the LM317 circuit, the calculation of the output voltage of the LM317 is specific as shown in formula 1:

$$K = 2 - \frac{1}{3w} + 3\beta \tag{1}$$

In Formula 1: K represents the output voltage, w represents the adjustment limit value, and β represents the actual control range. From the above calculation, the actual output voltage can finally be obtained. Using it as a microcontroller is the core standard voltage of the main control system, using Microchip PIC16F884. The PIC16F884 is the Microchip's high-performance 8-bit microprocessor, It uses a streamlined instruction set, Harvard bus structure, secondary water to take instructions, The chip is equipped with quite rich resources: high-precision internal oscillators, Enhanced low-current watchdog timer with an on-chip oscillator, High durability flash memory EEPROM unit, FLASH of 4K bytes, The 256 Bytes of the RAM, 35 IO pins with direction controlled control, 2 analog comparator modules, 14 A/D conversion channels at 10-bit resolution, 3 Time counters, Enhanced capture, comparison, and PWM modules, Enhanced USART module, Main Sync serial port, Supports a 3-line SPI and an IC primary/slave mode with an IC address blocking function, Greantly reduce the peripheral devices, And can be used for online serial programming with two pins, It facilitates debugging and subsequent development. When completed, the microcontroller also needs to be associated with other parts of the circuits.

The PIC16F884 has two timers that provide electric delay, an oscillator start timer to ensure that the chip is reset until the vibration reaches stability and an electric delay timer providing a fixed delay of 64 ms at each charge to ensure that the device is reset before the supply voltage stabilizes. If under pressure conditions occur, the under pressure reset circuit provides a reset delay of at least 64 ms. Because of these three functions, it no longer requires the assistance of external reset circuits in most applications, so that no additional external reset circuits are designed in this paper. And its oscillator module has a variety of clock sources and selection functions, through the software can choose the external or internal system clock sources. To reduce peripheral circuits and facilitate debugging, take the software to set the internal clock to 4 MHz [8]. Signal ADO, AD1, AD2, and AD3 are used for code dialing switch inputs. The dial switch is used to set the address of the master controller, the address of the RF905SE.AD0, AD1, AD2, and AD3 are directly connected to the I/O port of the MCU, and connected to the VCC by 10K resistance. When the switch is OFF, the pin level is high and a low level when the switch is ON [9]. After the MCU collects these pin levels, an address is obtained. As the receiving address of the RF905SE, only if the sending address of the NetUSB905SE wireless receiving module and the receiving address of the RF905SE match, the information can be successfully sent to the RF905SE through the NetUSB905SE, then read and decoded by the main control system, and transmits the DALI command to the next level through the DALI bus [10].

In addition, the circuit of the master control system has also designed two adjustable analog signals, implemented using two potentials, RT1 and RT2. Signal DTIME and LLD are the potentiometer voltage input. The potentiometer RT1 is used to set the shutdown time torr, where the presence of an abnormality is not detected by the topr time, and the execution command is issued. The potentiometer RT2 is used to set the desired recognition properties. In automatic dimming mode, the main control system issues an identification command by comparing the illumination and LLD values of the environment. The DTIME and the LLD are connected to the A/D functional pin

RBO/RB1 of the microcontroller, respectively. The potentiometer and receives a small capacitance to prevent voltage mutations that can act as filtering.

The signals ICSPCL, ICSPDA, VPP and GND and VCC, Implement the connection to the development tool, MPLAB ICD2, It has the capabilities of online debugging and online serial programming, Easy for development and commissioning; Signal PWR_UP, AM, TRX_CE, SCK, MISO, MOSI, TX_EN, DR, CD, CSN connect to the wireless communication module, Complete the wireless communication function; Pins COM1-, COM2-, DALIR, DALIRXEN, DALITXEN, and DALITX are used to design the DALI interface circuits, Complete the sending and receiving of DALI signals; The LIN is the luminosity detection signal, To detect the illumination degree of the external environment; HW is the input signal of infrared detection, For realizing automatic sensing; The LED is used for the indicator lamp control; The FM is used to control the buzzer alarm.

Subsequently, the design of the wireless communication interface circuits is also required. The RF905SE module of NewMsgis combined with the upper position computer USB wireless emission module to achieve stable and reliable communication under the same configuration. It uses the highest operating rate of 50 K in 433 MHz band b p s, high efficiency GFSK modulation, strong anti-interference ability, and is especially suitable for identifying control occasions. Functional descriptions of the RF905SE module pins are shown in Table 1:

Table 1. Description of rf905se module pins

Pin	Name	Pipe foot function	Explain
1	VCC	Source	3.3−3.6V DC
2	TX_EN	Digital input	TX_EN = 1
3	TRX_CE	Digital input	Enabling the chip to launch or receive
4	TRX_CE	Clock out	Enabling the chip to launch or receive
5	PWR_UP	Digital input	Chip on electricity
6	uCLK	Clock out	Enabling the chip to launch or receive
7	CD	Digital input	Carrier detect

According to the data information in Table 1, the actual RF905SE module foot introduction can finally be obtained. With the RF905SE operating voltage of 3.3V and the microcontroller PIC16F884 operating voltage of 5V, the RF905SE pins cannot be directly connected to the microcontroller pins, which need to increase flow limiting resistance that would otherwise burn the RF905SE module. It is worth noting that to simplify the SPI interface of the microcontroller PIC16F884, we connect the serial data output SDO to the MOSI of RF905SE, the serial data input SDI to the MISO of RF905SE, the serial clock SCK to the SCK of RF905SE, and the slave selection signal SS to the CSN of RF905SE. If the microcontroller does not have this SPI function module, an ordinary I/O port can be used to simulate the timing of the SPI interface through the software. When the RF905SE module receives the data, the signal CD is set high once the carrier of the frequency set in the module is detected; the valid address is received,

when the receiving address of the module matches the target address, the signal AM is set high; the valid packet is received, and decoded, the signal DR is set high; when all the valid data is read by the microcontroller, the RF905SE lowers the CD, AM, DR when read by the microcontroller [11].

To complete the communication function must support the interface circuit, the DALI communication interface part includes the transmitting and receiving circuits. The signal transmitted on the DALI bus requires its descent or descent along time between 10 and 100 us. The pressure difference of DALI bus is greater than 9.5 V indicates the high level; the pressure difference is below 6.5 V indicates the low level. The master circuit control system DALI interface circuit is associated with the microcontroller, and has 6 signals between the DALI interface: DALITXEN, DALITX, receiving enabling, receiving data, and receiving analog voltage. When the microcontroller needs to send data to the DALI bus, DALIRXEN = 0, when Q3 is off. The microcontroller gives DALITXEN = 1, DALITX = 0, when the triode Q2 is turned on and Q4 is cut off, thus turning the triode Q1 on, so that the pressure difference between DALIT and DALIR is about 20 V and the DALI bus presents a high level.The microcontroller gives DALITXEN = 0, DALITX = 1, when the triode Q2 is cut off and Q4 turns on, thus the triode Q1, so the pressure difference between DALIT and DALIR is the saturation conduction voltage of the triode Q4, about 0.5V and the DALI bus shows low level as shown in Fig. 3.11. According to the timing diagram analysis of Fig. 3.11, the data sent by the DALI bus is "0011".

To this end, a voltage comparator inside the microprocessor is used. The older negative end input produces a COM1-signal of about 0.2 V for the external resistance partial voltage. When the slave control system provides a high resistance transmission circuit, the pressure drop is generated on R13, R14 and R14, much lower than 0.2 V, so the comparator output is low level When the slave control system provides almost impedance circuit, the high pressure drop on R13 and R 14 (about 0.5 V) is above 0.2 V, so the comparator output is high level, the specific relationship structure is shown in Fig. 2 below:

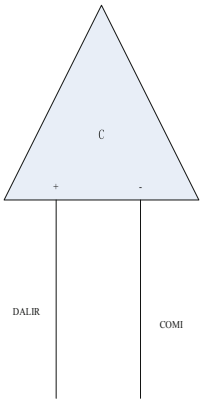

Fig. 2. Output high level diagram

According to the relationship structure in Fig. 2, the actual output is a high-level circuit relationship. When sending "0" through the circuit shown in Fig. 2, the master system microcontroller first controls the bus at high level for 417 us ± 10%, then puts the bus at low level for 417 us ± 10%; when sending 1, the microcontroller controls the DALI bus at low level for 417 us ± 10%, then puts the DALI bus at high level for 417 us ± 10%. High and low level switching is very convenient, and it is easy to design Manchester coding waveforms consistent with the DALI protocol. The master control system sends a complete DALI forward frame, including 1 starting position, 8 address bits, 8 data bits and 2 stops, where the starting position is "1" and a high stop level of 2 cycles, and finally completes the design of the main control circuit of the teaching mode recognition system.

2.2 PCB Plate Design

After completing the master circuit design of the teaching mode recognition system, the analysis and design of PCB board are required. The PCB plate layout and layered structure construction were performed. To judge the standard of the good PCB early design, the layout of this stage is very important. This is because the overall layout often directly determines the direction of the subsequent wiring and the characteristics of the system functions. The PCB board size, height of panel device and forbidden layout area are determined by the interior space of the UAV. The specified size of the plate is 18 mm and 18 mm, and the height of the plate surface device should not exceed 1 cm, so this factor should be taken into account in the selection of the device.

The general principles of PCB circuit board layout are as follows: one is that according to the layout principle of "first large, then small, first main, then auxiliary, first complex and then simple," to the larger or special electronic components, circuit modules with core functions should consider the priority layout. All line length should be as shorter as possible, key signal such as CLK to be the shortest line; analog signal and digital signal; high frequency signal from low frequency signal; high voltage, high current should be completely separated from low voltage, low current; the interval of high frequency elements should be spacious enough. The second is the design should refer to the principle of the layout, prioritithe main devices according to the main signal direction of the circuit board. Third, the same type of plug-in components should be oriented consistently; the same type of polar separation elements of the same type should also be oriented in the same direction; convenient for later welding and testing. Heat elements should be evenly distributed to facilitate the heat dissipation of the overall plate. For the same type of circuit module, try to adopt the layout standard of "symmetry"; the overall arrangement of the components should be convenient for debugging and maintenance, and leave enough room around the elements that need to be debugged. The fourth is to optimize the layout according to the standard of uniform distribution, center of gravity balance, overall coordination, and beautiful layout. According to the principle described above, the design adopts the principle of FPGA as the core, according to the main signal flow direction, SRAM, SDRAM surround, power supply, signal interface edge placement, and the overall beauty and symmetry.

During the layout, Determine the core location of the FPGA, Identity and lock the position in the PCB software tool; Then according to the specific situation of FPGA

round, Under the principle of ensuring that the same class of recognition signals is connected to the same Bank, Determine the location of SRAM and SDRAM around it; Then determine the CF card and USB interface positions with reference to the identification signal flow direction and the plate size, Considering the easy operation and overall beauty of the CF card, Place it symmetrically on the upper side of the plate; Finally, according to the recognition level value of the power supply, Size value of the power chip, power supply mode and heat dissipation to determine the layout of the power supply; Other test feet are left in an open space.Identification stratification of the entire PCB after determining the overall layout of the identification system.In this system, the FPGA has a total of 680 IO feet, encapsulated as BGA, according to the principle of the cruciferous outgoing line, at least six layers of signal outgoing line, combined with the power supply and ground of the whole board, set to a total of 12 recognition layers.

After completion, design the power supply and the identification of the ground line. The design of the high-speed electronic identification system includes all aspects, which needs to be thoughtful about all aspects, and the first consideration is how to reasonably allocate the power supply. The reasonable and effective distribution of power supply will directly affect the stability of the whole circuit system function. Setting up the power supply identification layer mode and the bus mode are two common basic methods in the process of power supply distribution: the bus mode refers to the power supply system composed of the power supply recognition transmission lines, which are determined due to the different power supply voltages of different circuit modules in the circuit system. Under the design of the bus mode, the power supply and the device will produce the impedance during the transmission process, and the function of the transmission line is equivalent to the resistance, which directly leads to the minimum output impedance of the whole power supply system. In the circuit system identification design, the circuit board is required to be layered, and the corresponding power supply or local attributes should be added to the different layers. This whole circuit board frame jointly constructed by the power supply layer and the formation is the power supply layer mode. In this way, the role of the overhole is particularly obvious, which is a bridge between the power supply corresponding to the specific device and the whole system.In the process of return, the signal can always find the shortest circuit path through the perforation, and the minimum output impedance of the corresponding circuit system will also become smaller. The direct effect is to reduce the noise of the power supply. When the whole identification system is performed, different degrees of noise will be generated, so it must be fully considered and corresponding filtering measures to reduce and reduce noise generation.

The power supply recognition filter is a noise reduction filter method often adopted in the design. It is generally realized by placing the filter circuit in the circuit system. The commonly used filtering schemes are L-type filter, T-type filter and T-type filter. Capititors from 1 uF to 10 uF are often used to filter out low frequency noise, while capacitors from 0.01 uF to 0.1 uF are placed at the power input of the active device to filter out high frequency noise. The capacitance should be placed as close as possible to the chip, and the lead is as short and as thick as possible. And for the same level to supply of different digital modules and analog modules, need to be separated through magnetic beads. The identification of the directly adjacent signal layer should not appear

in the design, all the signal layers can be interspersed with the power layer or connected to the formation for spatial isolation. When wiring, the actual wiring of the circuit board should be as thick as possible than the power line, and the power line is thicker than the signal line.Subsequently, in the difference pair walk, the difference pair line width is 8mil, and the differential signal line spacing is less than or equal to between the signal lines.

The distance between the difference and the difference pairs is not less than 50 mil 35, and try to avoid the emergence of the interlayer difference signal, using the difference pairs within the same layer. The line of the difference pair should be as short as possible, the straight line, minimize the number of holes through the line or avoid the gap, the signal line within the difference must remain the same, and the length of the two lines of the difference line signal should be as close as possible. To ensure that the characteristic impedance of the signal line is continuous everywhere along the signal line and maintains a constant, the differential impedance should be controlled at 1002 $\pm$ 5%, to ensure that the impedance matching. Avoid right angle curve, use arc or 45° oblique angle instead. Finally, the design of PCB board cloth is completed, so the design of the overall hardware of the above teaching recognition system is completed.

3 Software Design of Online Teaching Mode Recognition System for Ideological and Political Courses

3.1 Design of Teaching Recognition Function Module Under Hash Algorithm

Generally speaking, the auxiliary function of the identification system involves three links, including collection, processing and transmission, which is also the key to the identification system design. There is a great difference between the computer language and the natural language of the video. How to accurately identify the differences between the two languages is a problem that must be solved when identifying software recognition. Ideological and political feature extraction technology is the basic composition of the speech recognition system. It is mainly responsible for extracting the ideological and political features, providing an accurate language signal to the translator in time, and improving the accurate coefficient of computer translation work. The following are the related processes, as shown in Fig. 3 below:

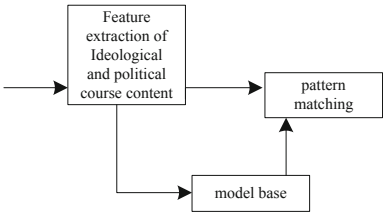

Fig. 3. System teaching identification flow chart

The corresponding software design is continued according to the process in Fig. 3. The speech recognition system should match the corresponding functional modules to

assist teachers and students to translate the language meaning of ideological and political content in a short time, so as to avoid the inconvenience caused by artificial translation and language errors. Therefore, the scope of association identification is need to be determined, as shown in formula. 2:

$$M = \kappa + 0.5a - \frac{1}{2} \tag{2}$$

In Formula 2: M represents the association recognition range, κ represents the recognition control ratio, and a represents the matching range. Through the above calculation, the actual association identification range can finally be obtained. Within this scope, the diversified mode matching technology adopts an intelligent identifier, which automatically recognizes and analyzes after the translator enters the voice, so as to reduce the difficulty of manually translated statements. For example, computer recognition software establishes a matching model, according to the matching translation mode of English words, words, sentences and other structural forms, the final language results can be obtained by executing the program command, and give students help in speech recognition. After this, training on the identification module was performed. The speech recognition system is designed to realize educational informationization. Here, based on the above, the recognized training ratio should be calculated, as shown in formula. 3:

$$L = \frac{1}{Y + 0.25R} + 2\delta \tag{3}$$

In Formula 3: L represents the training proportion of recognition, Y represents the execution time, R represents the recognition speed, and δ represents the actual recognition range. With the above calculation, the actual identified training ratio can finally be obtained. Help the teachers to solve the translation problems encountered in the ideological and political classroom teaching, and deepen the students' understanding of the ideological and political knowledge. After the voice recognition ends, the translator will automatically perform the simulation training operation to create a virtualized voice training platform for the students, which is also a more practical function of the software recognition system. The simulation training technology adopts the man-machine integrated design idea, which combines the translator, the voice identifier and so on to implement the training methods, quickly identify and judge the English voice level, and guide the students to adjust the voice mode. Ideological and political content converter is a necessary operation tool for modern teaching. Teachers and students can accurately understand the deep meanings of various words with the help of the content converter function, which puts forward more requirements for the design of speech recognition system. The author believes that the design of the speech recognition system should consider the specific workflow of the translator, and arrange a scheme that meets the translation software in advance, so as to improve the human-computer language conversion rate, combine the hash algorithm, and control the corresponding recognition conversion vector with the hash algorithm, as shown in Eqs. 4, 5 and 6:

$$G = \sqrt{2d + 1.25} - \gamma + \frac{1}{3} \tag{4}$$

$$T = \sqrt{2d + 1.25} - 2\gamma + \frac{1}{4} \tag{5}$$

$$O = \sqrt{2d + 1.25} - 3\gamma + \frac{1}{5} \tag{6}$$

In formulas 4, 5 and 6: d represents the recognition conversion vector, and γ represents the control range. With the above calculation, the actual recognition conversion vector can finally be obtained. Set it in the control module of the system, the voice recognition system design and application situation: for the basic recognition module. The speech recognition method is mainly the mode matching method, which conducts matching processing according to different translation requirements to realize the accuracy of ideological and political multi-level vocabulary. First, in the training stage, the user says each word in the vocabulary in order, and puts its feature vector as a template into the template library. The second is in the recognition stage, the feature vector of the input voice compares the similarity with each template in the template library, and the highest similarity is output as the recognition result [12]. In addition, it is the front-end module. Front-end processing refers to the processing of the raw speech before feature extraction, which is the main role of preprocessing operations. Speech recognition system is often affected by external interference and reduces the accuracy of translation [13]. The design of the front section processing module can eliminate some noise and the influence of different speakers, so that the processed signal can more reflect the essential characteristics of speech. The model of speech recognition systems usually consists of two parts: acoustic and language models, corresponding to the calculation of speech-to-syllable probability and byte-to-word probability, respectively. The extraction and selection of acoustic features is an important link in speech recognition. This step is directly related to the overall work efficiency and has a certain influence on the recognition and learning of ideological and political teaching. Complete the design and association of the teaching recognition function module under the hash algorithm.

3.2 Multi-core Identification Database Design Under the Hash Algorithm

After completing the design of the teaching identification function module under the hash algorithm, a multi-core identification database also needs to be created. When designing the software function, the system function code is mainly completed through the use of C, casel ~ case6 indicates no sound detected, retraining, noisy environment, database full, different sound detected, serial number error, RSP_NAMEDIFF and RSP_CMDDIFF indicate two input names respectively, so, according to the actual situation, design and construction, and calculate the identification span coefficient, as shown in formula 7:

$$B = \omega - \sqrt{2m + 1} \tag{7}$$

In formula 7: B represents the recognition span coefficient, ω represents the feature recognition control ratio, and m represents the time-frequency feature decomposition value. Through the above calculation, the actual identification span coefficient can finally be obtained. Subsequently, in the design of the above system software, the design of the multi-core identification software is performed. The establishment of the database is based on feature decomposition and association dimension feature registration. Then, in the process of teaching, we can identify the existing ideological and political knowledge

of voice, pictures and video, and the automatic detection process of multi-core identification database is to complete the noise reduction processing of ideological and political content signal through the use of time and frequency feature decomposition method. On this basis, through the comprehensive use of time-frequency analysis and extracting related information legitimate characteristics, to further optimize the automatic pronunciation error detection method of multi-core identification database, to improve the error detection ability of pronunciation identification. Combined with the hash algorithm, the feature identification matrix is created and its feature extraction coefficient is calculated as shown in Eqs. 8, 9 and 10:

$$F = \frac{t + 2y}{2} - 3\Re \tag{8}$$

$$S = \frac{t + 4y}{2} - 6\Re \tag{9}$$

$$A = \frac{t + 6y}{2} - 9\Re \tag{10}$$

In formulas 8, 9 and 10: F, S and A represent feature extraction coefficients, t represents detection difference, y represents hash ratio, and $\Re$ represents recognition range. Through the above calculation, the actual feature extraction coefficient can finally be obtained. It is set in the model of the system recognition, the input state parameters are used to represent the length of the recognition input signal, the corresponding difference represents the wavelet coefficient, the output ideological and political change course content signal is characteristic decomposed and registered, the decomposition filter group is represented by AFB, and the soft threshold function of the speech recognition system. It was determined and clearly defined. Combined with the feature extraction coefficients calculated by the hash algorithm, the pronunciation signal reorganization in the process of multi-core identification database is completed by using the wavelet multi-layer reconstruction method. The reconstruction filter group of the system is represented by SFB, and the inverse transformation values of the obtained signal filtering are obtained. After completion, after the error detection and output recombinant pronunciation signal is completed combined with the wavelet multi-layer reconstruction method, the correlation information of the signal is extracted, and the pronunciation signal is converted from the time domain to the frequency domain by the time-frequency analysis method, and the instantaneous frequency of the voice signal is adopted. Finally, the design of the multi-core identification database is completed under the hash algorithm.

4 System Test

4.1 Test Preparation

The ideological and political courses of School A were selected as the main test target. The identification rate of the system was tested, and the system was tested in quiet and noisy environments, each test instruction was tested 10 times, and against specific people in different environments, recording the number of successful identification of the

system by 5%. The sampling frequency was set to 12,500 Hz, and the signal-to-noise ratio during the pronunciation recognition process ranged from −5 dB to 20 dB, which can sample the different recognition ratio of the system by the signal beam. After completing the construction of the above test environment, check whether the corresponding test equipment is in a stable operation state, and there are no external factors affecting the final test results, check correctly, and start the test.

4.2 Test Process and Results

In the test environment built above, test. The specific test procedure is shown in Fig. 4 below:

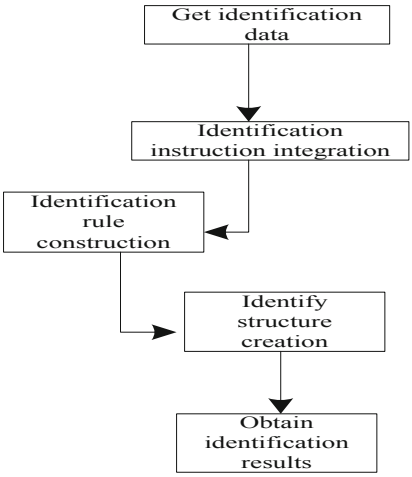

Fig. 4. Test flow chart

According to the test in Fig. 4 above, the corresponding test results can be obtained and comparative analyzed, as shown in Table 2 below:

Table 2. Analysis of test results

Test group	Literature [5] system recognition rate\%	Literature [6] system recognition rate\%	This paper designs the system recognition \%rate
Test group 1	82.15	87.12	92.15
Test group 2	76.34	85.34	90.55
Test group 3	79.15	88.13	94.31
Test group 4	75.12	86.54	93.51
Test group 5	60.25	78.31	90.57

It can be seen from Table 2 that, compared with the systems of literature [5] and literature [6], the recognition rate of the system designed in this paper is higher, up to 94.31%, while the highest recognition rate of the other two methods is only 82.15% and 88.13%, which shows that the recognition effect of the design method is better, with strong stability, high recognition accuracy and high practical application value.

5 Conclusion

In order to accurately identify the online teaching pattern recognition effect of Ideological and political course and improve the quality of Ideological and political teaching, this paper proposes an online teaching pattern recognition system of Ideological and political course based on hash algorithm. In the hardware part of the system, the main control circuit and PCB board of the teaching pattern recognition system are designed; In the software part, the teaching recognition function module adopts hash algorithm, designs the multi-core recognition database under hash algorithm, and then completes the design process of online teaching pattern recognition system of Ideological and political course. The final test results show that the recognition rate of the design system is high, all above 90%, indicating that its recognition effect is good, has strong stability and certain practical significance, in order to provide some help to improve the quality and efficiency of Ideological and political teaching.

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2. University-level undergraduate engineering project: "Introduction to Basic Principles of Marxism" first-class course of social practice; No.: (2020SHSJ03)

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