Plant slope reconstruction in plain area based on multi-core ARM and music teaching satisfaction

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Abstract
In this paper, we will first implement a multi-core tracking-learning-detection target tracking algorithm based on multi-core advanced RISC machines (ARM) processor, in order to accelerate and optimize the algorithm on the basis of understanding the algorithm, so as to improve the real-time performance of the algorithm. On one hand, the algorithm is improved to reduce the computation and complexity of the algorithm, and on the other hand, to make full use of the computing resources of the processor and optimize the algorithm through hardware acceleration. Considering the mechanical action of the vegetation root system in the plain area, this paper analyzes and studies the influence of plant slope transformation on the overall stability of slope. Referring to many related literatures, the reconstruction mechanism and reinforcement method of plant slope can effectively improve the deformation characteristics and shear strength of soil, and the fixation effect of coarse roots is the best in the whole slope. Based on the statistical analysis of the morphological distribution characteristics of plant roots, in the case of flat slope, the vertical extension of roots can achieve slope stability and better root function. In music teaching, the long-term neglect of music education will lead to the neglect of the work of teachers in specific fields and ultimately lower the satisfaction of teachers, especially when the development of music teachers is relatively backward. This paper investigates the job satisfaction of high school music teachers in specific areas. The main purpose is to arouse the attention of the education authorities to the current situation of music teachers and to ask their ideas and questions. Teachers need to refer to and clarify their goals, so that teachers and staff can improve their overall ability and clarify their development goals. According to the research of multi-core arm, it is applied to the analysis of the satisfaction degree of slope land transformation and music teaching in plain area, so as to promote the development of land transformation and teaching.

Keywords Multi-core ARM · Plain area · Plant slope land transformation · Music teaching · Satisfaction

Introduction
In recent years, artificial intelligence has received unprecedented attention, and artificial intelligence is constantly changing our production and lifestyle, providing us with great convenience and rich experience. Computer vision is one of the most important technologies of artificial intelligence, which enables machines to recognize and understand the surrounding environment like human eyes. Today’s embedded platform based on multi-core ARM processor has limited computing power, while high-performance target tracking algorithms usually have high complexity (Javadinejad et al. 2019). Therefore, it is of great significance and application value to study the implementation and acceleration optimization of target tracking algorithm for multi-core ARM processor to improve the real-time performance of the system. The transformation of plant slope land not only has strong taproots but also has dense fibrous roots (Jiang et al. 2019). The flat slope is strengthened by the fixation of thick roots and fiber roots (Marini et al. 2019). The comprehensive consideration of the reinforcement and fixation effect of plant slope transformation route system in the design of cutting slope can make the slope design of flat land more
reasonable, effectively reduce the land area of the project and has good economic benefits. In addition, vegetation slope protection also has many functions, such as soil and water conservation, air purification, landscaping, ecological restoration and so on, which has good ecological benefits. Afforestation and slope protection have become the inevitable development trend of slope protection (Matrhews et al. 2019). This paper adopts a simplified evaluation method centered on system cooperation to evaluate the quality of music teaching in existing music education institutions, so as to improve the satisfaction, reduce the burden of evaluation, and try to optimize and reform (Zarei 2018). For example, in the classroom assessment, the electronic listening assessment form is used to share the work pressure of teachers’ assessment, to link teachers’ welfare and salary with the assessment of music classroom education and to stimulate teachers’ education and professional achievement (Moghimi et al. 2019).

Secondly, we can break the limitations of the current music classroom evaluation mechanism in music education institutions by increasing the number of evaluation objectives, which is mainly by inviting teachers from different disciplines to participate. Through qualitative research, we investigated the job satisfaction of rural high school music teachers in specific areas, such as personal interview, group questionnaire or personal questionnaire. Through the way of prediction and repeated discussion to interview music teachers’ job satisfaction, we finally build a more appropriate questionnaire for music teachers’ job satisfaction in specific fields (Musie et al. 2020). Then, using SPSS 21.0, 65 music teachers from 30 schools were selected to conduct official surveys in specific areas and three major cities A, B and C to collect data. Through data analysis, considering the basic situation and characteristics of current job satisfaction, this paper summarizes the problem of music teachers’ job satisfaction, which is attributed to the improvement of music teachers’ job satisfaction (Noor 2017).

Materials and methods

Calculation model of plant slope land transformation stability

Many scholars have done a lot of statistical analysis on the distribution characteristics of plant roots, such as root diameter and root number, but plant roots will have different differences due to the differences of organisms and soil environment in different regions (Zare Feyz Abadi et al. 2006). The main differences include root diameter, tensile strength and root angle. Therefore, it is almost impossible to completely restore the distribution and mechanical characteristics of plant roots in the stability calculation of root protection slope. In the safety factor calculation model, the following assumptions are made for plant roots (Nyangena et al. 2020).

a. Assuming that all plant root systems have the same properties regardless of individual differences.

b. Assuming that the volume density of root soil and rootless soil is the same, the mass of root and upper part of plant is ignored.

c. It is assumed that the effect of soil friction angle is ignored and only the agglutination of soil is increased.

d. Suppose that in the limit equilibrium state, the angle between the root of sliding surface and soil sliding surface deformed by soil sliding is 45°.

It is assumed that the anti-skid force provided by the tensile force generated by the root is evenly distributed along the length of the slope.

The sliding force of soil strips in root system slope stabilization is as follows:

\[
T_{si} = W_i \sin \alpha_i. \tag{1}
\]

The sliding resistance provided by the soil strip itself is as follows:

\[
R_{si} = W_i \cos \alpha_i \tan \varphi + c l_i. \tag{2}
\]

The anti-sliding force provided by anchor action of main root is as follows:

\[
R_{rj} = \left( F_{rj} \sin \theta_j \tan \varphi + F_{rj} \cos \theta_j \right). \tag{3}
\]

The anti-sliding force provided by fiber root reinforcement is as follows:

\[
C_r = k' k'' \sum_{k=1}^{m} T_{rk} \frac{A_{rk}}{A}. \tag{4}
\]

\[
R_{rk} = C_r l_i = k' k'' \sum_{k=1}^{m} T_{rk} \frac{A_{rk}}{A} \cdot l_i. \tag{5}
\]

The safety factor of slope protection by planting trees is as follows:

\[
K_s = \frac{R \cdot (\sum R_{ri} + \sum R_{ri} + \sum R_{ri})}{R \cdot \sum T_{si}}. \tag{6}
\]

Therefore, the increment of the safety factor of tree planting slope is as follows:

\[
\sqrt{2} (\tan \varphi + 1) \sum_{j=1}^{m} \frac{K_r - K_s}{F_{rj} / 2d + k' k'' \sum_{k=1}^{m} T_{rk} \frac{A_{rk}}{A} \cdot (l_1 + l_2)} \sum_{i=1}^{n} W_i \sin \alpha_i. \tag{7}
\]
**Multi-core ARM architecture design**

In order to execute commands efficiently, modern processors use a variety of pipelining techniques to divide commands into multiple basic commands and execute multiple basic commands in pipelining mode, so as to execute them accurately and match with split commands (Yu et al. 2020). At the same time, modern processors can execute multiple basic commands at the same time, which improves command throughput and command execution efficiency. Each processor architecture has different pipeline levels and can be replicated in a multi-level pipeline system. The total number of instructions is the same as the number of processor pipeline levels (Omer et al. 2020).

If the actual execution of the command depends on the number of command operands, the command delay will be inconsistent or branch transmission or interruption will occur, then the pipeline will be blocked and the performance will be reduced. In order to execute commands as efficiently as possible, modern processors use techniques such as branch prediction and discontinuous execution to significantly improve the efficiency of instruction execution (Pakrooh et al. 2020).

**Investigation method of music teaching satisfaction**

The researchers took samples from 30 secondary schools in three cities A, B and C, and rural areas. Sixty-five music teachers were selected as representatives, and the phenomenon of job satisfaction was investigated, which is also an important basis for this work.

After half a year of investigation, the sample selection was obtained by random selection. Ten rural high schools (including the completion) were randomly selected in each of the three cities of Suzhou Wuxi Chang. Then, 65 music teachers were selected from each school. After the completion, the questionnaire was collected on the spot. Most of the teachers who filled in the questionnaire were interviewed. The questionnaire analysis was reviewed, and interviews were summarized (Tsakiris et al. 2007).

The survey and measurement tool of this study is a self-made questionnaire which mainly includes job satisfaction of music teachers in rural high schools in a certain area. It is divided into two parts. The first part is personal basic information, and the second part is the survey of the current situation and influencing factors of the work satisfaction of music teachers in a certain area, with 33 questions in total. The questionnaire design is based on the Minnesota Satisfaction Questionnaire (Ullah et al. 2020). The questionnaire was scored by 5 points of Likert scale, with A with great agreement of 5 points, B with 4 points, C generally 3 points, D disagreements with 2 points and E very disagree with 1 point (Yousefi et al. 2013).

**Results**

**Analysis of soil fixation of plant root system**

Vertical root system: vertical root system is developed and dominates the whole near end system, while horizontal root system and sagun system are relatively short or few, as shown in Fig. 2a.

Horizontal root system: the horizontal root system is developed and dominates the whole near end system, while the vertical near end system and sagun system are relatively short or few, as shown in Fig. 2b.

Root type of sagun: sagun system develops and dominates the whole root system, and the horizontal root system and vertical root system are relatively short or few, as shown in Fig. 2c.

Complex root types: the roots developed in all directions of the root system are very developed and relatively balanced, so it is difficult to determine the developed root system, as shown in Fig. 2d.

Abnormal root type: the root system is deformed due to the special external factors during the growth process and described by the four types of root types, such as warping when the growing soil layer fills the rock. As shown in Fig. 2e, a fan-shaped shape is formed at the root of the rock crack.
For the subgrade slope, the dangerous sliding surface may be deeper, and the roots of herbs, shrubs and horizontal trees are difficult to pass through the deep sliding surface, so it cannot play the role of overall stability and slope reinforcement; it can only be used as the slope. The function of surface erosion is to resist slope erosion and shallow reinforcement. In order to better play the role of plant roots to improve the overall stability of the slope, more roots can pass through the dangerous sliding surface and perform the fixed function. Therefore, we need to select a tree with vertical roots and vertical downward roots to improve the slope stability.

Through the research and analysis of the root tension test method and test process, it can be found that the principle of the root tension test method is basically the same as that of the pile foundation tension test method and “technical code for building pile foundation”. The force and root surface area are measured, and the analysis results are shown in Fig. 3.

Through the regression analysis of root pullout resistance and root lateral surface area, we can see that there is a linear relationship between them, and the correlation coefficient is more than 0.92. The coefficient of the linear regression equation is the standard value of the ultimate lateral resistance. The comprehensive test of soil quality, the degree of compression and the same factors existing in the coefficients of the linear regression equation are compared with the value of the ultimate surface resistance of the pile. As shown in 5.3.5-1 of the technical code for building pile foundation, the standard value of the ultimate resistance of the root system is the same as the standard value of the ultimate lateral resistance of the pile in the code. The standard value of the final surface resistance of root is slightly higher than that of pile. Organic colloidal clay particles enhance the binding force between roots and soil. Therefore, it is safer and more reliable to choose the standard value of the ultimate lateral resistance of concrete pile to calculate the root resistance of plants rather than the binding force between concrete and soil.

Calculation results of plant slope land transformation stability

Whether the root of plant can enhance the overall stability of slope depends on whether the root can pass through the sliding surface and play a fixed role. On one hand, the deeper sliding surface depends on how deep the sliding surface on the slope is and whether the sliding surface is within the distribution range of the root system. This section focuses on the location of the sliding surface of the most dangerous slope.

![Schematic diagram of root morphology](image1)

![Relationship between root pullout resistance and root lateral surface area](image2)

![Graph showing the relationship between root pullout resistance and root lateral surface area](image3)
As shown in Fig. 4, under the condition of the same tilt ratio, with the increase of the tilt height, the depth of the sliding surface gradually deepens. Under the condition of the same tilt height, with the decrease of the tilt speed, the sliding surface will increase conversely. According to the comprehensive comparison chart (b)–(f), regardless of the tilt ratio and tilt height, the slip depth of the ground is always within 1 m, and the slip surface depth of no. 2 soil zone is between 1 m and 2 m. Finally, the slip surface depth of the soil strip is basically near 1 m, the slip degree of no. 3 soil is \( n - 1 \) and the surface depth is greater than 2 m. It has little effect on the slope height, the depth of no. 1 and no. 2 soil strips at the foot of the slope and the last soil zone at the top of the slope.

As shown in Fig. 5, under the condition of the same slope height and slope rate, the sliding surface depth of different soils is silt slope sliding surface depth < silty clay slope sliding surface depth < clay slope sliding surface depth. The depth of no. 1 strip is within 1 m, that of no. 2 strip is between 1 m and 2 m, that of the last strip is about 1 m and that of no. 3 ~ \( n - 1 \) strip is more than 2 m, which is greatly affected by soil conditions, especially near the top of slope. It can be seen that the change of slope soil has little effect on the depth of no. 1 and no. 2 soil strips at the foot of slope and the last soil strip at the top of slope.

Considering the tree crown size, planting requirements and planting spacing requirements, the best planting position of trees is at the boundary between no. 1 and no. 2 soil strips, which is 1 m away from the slope. While considering the slope factor of the side slope, it is also in order that more roots can pass through the potential sliding surface. It can be planted 50 cm away from the first and second soil zones; then, the slope shape is refilled, and the length of root anchorage was increased to create fixed roots, which will make the slope stability better. As shown in Fig. 6, a row of trees planted along the slope toe of road cutting are like anti slide piles, which provide additional anti slide force for the slope at the slope toe.

We can also choose to plant some grass and wood or shrubs on the hillside to prevent soil erosion and shallow landslide. At the same time, we can combine the root distribution characteristics of different plants to maximize the role of different plants. The purpose of this paper is to give full play to the
protection of various plants on the slope, which makes the slope protection of all kinds of plants play a maximum role, and each performs its own duties, which is not only the anchoring role of deep root trees, but also making full use of the shallow reinforcement of herbs and shrubs, while reinforcing the slope. It can form a beautiful landscape with a staggering place.

Analysis of factors influencing the stability of plant slope reconstruction

It can be seen from Fig. 7 that the increase rate of the safety factor of tree planting protection slope decreases with the decrease of slope rate, and the increase rate of height safety coefficient of each slope is close to that of each slope. As the growth rate gradually decreases. When the slope ratio is 1:2, the safety factor increases by less than 5%, which indicates that tree planting protection can significantly improve the safety coefficient on steep slopes, which has a great influence on the overall stability of steep slopes.

In Fig. 8, it can be seen that the stability and safety factors of natural slope and plant protection slope decrease with the increase of slope, and the safety factor is inversely proportional to the slope.

As shown in Fig. 9, it can be seen that with the increase of slope height, the increase rate of safety factor will decrease. At the same time, plant protection measures have a great impact on the safety factor of slope, that is, the effect of tree protection on the overall stability of low slope is more significant. When the slope ratio is 1:2, the food protection factor of the slope safety factor is 2 to 4%. When the slope height is increased to 10 m, the increase rate of the safety factor is only 2.495%, which indicates that the stability of the slope is weak. When the slope ratio is close to 1:2, the improvement of safety factor by plant protection is very small, and the effect of slope stability reinforcement is very weak, which is consistent with the previous research conclusion of slope ratio on slope stability.

Moreover, in Fig. 10, when the height of the slope is more than 8 m, the increase rate of the safety factor of planting trees to protect the slope is less than 5%, and it can be seen that due to the slope, the strengthening effect will be significantly improved, and the overall stability of the slope will also be improved. However, the improvement of slope stability by planting trees is limited, and only in a certain range of slope height can it play an important role in reinforcement. According to the above analysis, we can draw the following conclusions: when the slope height is less than 8 m and the slope speed is not less than 1:1.5, planting trees has a significant impact on slope stability.

As shown in Fig. 11, the longer the root length is, the higher the safety factor of the slope is. It can be seen that the safety factor of the slope is related to the length and quantity of the root system. When the root length is increased by 30% or more, the slope stability and safety factor will not increase and keep a fixed value. This is because the friction between the root and the soil increases with the length. Therefore, the maximum tensile force provided by the root system depends on the tensile strength of the root system. When the root
diameter is constant, the root system is also constant, the ultimate tensile force provided by the root system is also constant, and the maximum tensile strength is also constant, and this value will not lead to the increase of the safety factor of tilt stability. If the friction resistance between root and soil is less than that of root, it can be seen that the longer the root is, the greater the safety factor will be. The safety factor does not increase with the increase of the root tensile strength and the length of the inclined path system, and the improvement of the safety factor depends on the diameter of the path.

As can be seen from Fig. 12, with the increase of root diameter, the safety factor of slope increases, and the safety factor is positively correlated with root diameter. When the root diameter increases by 60%, the safety factor no longer increases with the increase of root diameter. The reason is that after the root diameter increases to a certain extent, the safety factor of the sliding surface within the distribution range is greater than the minimum safety factor of the sliding surface outside the distribution range of the root system, so the most dangerous sliding surface of slope changes. Therefore, the minimum safety factor of the slope depends on the safety factor of the most dangerous sliding surface outside the root distribution and no longer increases with the increase of root diameter. When the increase of root diameter is less than 60%, the slope safety factor has a linear positive correlation with root diameter. With the increase of root diameter, the ultimate tensile force of root increases, and the friction between root and soil also increases, and the friction between root and soil has a linear positive correlation with root diameter, which indicates that the ultimate tensile force of root is greater than the friction between root and soil. The ultimate tensile strength provided by the root system depends on the friction between root and soil, and the root system is not broken.

As shown in Fig. 13, by summarizing the calculation results of the influence of root length and root diameter on slope stability, we can find that both the increase of root length and root diameter will continuously improve
the slope stability within a certain range, which also shows that with the growth of arbors planted at the foot of slope, the root length and root diameter will also increase, so we can judge that with the passage of time, the effect of slope reinforcement is gradually strengthened by adopting the form of tree planting protection, which is quite different from the engineering protection measures.

Through the analysis of the comparative relationship curve, we can also find that the root length and root diameter increase in the same proportion, the increase of root diameter has a greater increase in the safety factor than the increase of root length and the increase of root diameter has a stronger persistence in improving the safety factor of slope stability. The reason is that with the increase of root length, the friction between root and soil is greater than the tensile strength of root, which leads to the tensile force provided by root to reach the limit value and no longer improves the safety factor of slope. However, with the increase of root diameter, the friction between root and soil and the ultimate tensile force of root are improved. The ultimate tensile force of root diameter is always greater than the friction between root and soil, so that the improvement effect is more lasting until the safety factor of the sliding surface within the range of root distribution is higher than that outside the range of root distribution. This has a certain guiding significance for us to choose slope protection tree species, which not only requires the tree root to have enough length, but also the root diameter to be as thick as possible, so that the reinforcement effect of slope stability can be more significant.

**Research results of music teachers’ teaching satisfaction**

The job satisfaction of rural high school music teachers in specific areas starts from six dimensions: gender, age, educational background, professional title, professional title and income. The size can reflect the details of the music teacher, and
the actual situation of satisfaction is the result of the following aspects of the survey.

The results are shown in Table 1.

From the above data analysis, we can see that gender does not significantly affect school system satisfaction, professional development opportunities, school interpersonal relationship or performance evaluation system. However, although there is a certain difference between male and female teachers’ job satisfaction and jikuopryok’s salary, it is not very clear.

The results of variance analysis of age on each variable are shown in Table 2.

According to the analysis of variance of salary and maintenance fees, school system, career development opportunities, teachers’ jikuopryoku, school interpersonal relationship and performance evaluation system by age, the performance evaluation system of teachers over 50 years old is significantly higher than that of other age groups. This shows that older teachers have stronger subjective initiative due to longer teaching experience, which will make the satisfaction results better.

Now, the analysis of variance is made on the difference of educational background to each variable, and the specific results are shown in Table 3.

As shown in Table 4, variance analysis is performed on the variance of the variable differences between different positions.

From the above analysis results, it can be seen that the satisfaction of the performance evaluation system of teachers in different positions is polarized. Among them, the satisfaction and performance evaluation of non graded teachers and senior teachers are lower, while the satisfaction of junior and intermediate teachers is higher, which indicates that the current performance evaluation system for each professional work has disadvantages. As the performance evaluation system is an integrated performance evaluation system, there are two levels of performance evaluation satisfaction.
Discussion

Strategies for strengthening teaching quality

Improve the operation and management of music education institutions

Combined with the actual situation, the operation and management construction of music education institutions need to improve and integrate the internal and external teaching management construction. We should not only carry out the construction of the basic system but also realize that all staff work has rules to follow, laws to follow and all kinds of work processes to implement. At the same time, we should follow the principle of improving the quality of teaching business and customer satisfaction as the core to continuously improve the quality of teaching and achieve customer satisfaction. The specific plan is as follows:

(1) Formulate and promulgate an internal control system.
After summarizing and analyzing the problems of the company’s teaching quality and operation management, the management team made a comprehensive analysis, through interviews with members to seek opinions, with the help of the expert committee and external peer exchanges. The “guidelines for the management of music education institutions” have been formulated, which only have rigid requirements for the internal teaching management of institutions. With the establishment and implementation of the management system, the operation and management of the mark value have entered the track of scientific management. Since then, the development, tracking, supervision and comparison of various work and business have been implemented to the data level. Because it is a large music education institution, there are many departments and inconveniences in management. An operation management team should be set up in the organization. This department should have special management personnel and should have a detailed understanding of the actual situation of each department within the organization, so as to better perform the management responsibilities. Only in this way can we create a prosperous situation within the organization. At the same time, for the internal education reward and punishment system, assessment system, evaluation scoring system, etc., the assessment and evaluation results will be

Table 1 Analysis of variance of gender on each variable

| Factor                                | Male   | Female  | F test | Significance |
|---------------------------------------|--------|---------|--------|--------------|
| Salary                                | Mean   | 3.7536  | 3.8481 | 2.031        | .361          |
|                                       | SD     | .55175  | .49787 |              |              |
| School system                         | Mean   | 3.8177  | 3.8103 | 0.039        | .828          |
|                                       | SD     | .61031  | .57802 |              |              |
| Professional development opportunities | Mean   | 3.5516  | 3.5713 | 2.057        | .164          |
|                                       | SD     | .7468   | .6971  |              |              |
| Professional power of teachers        | Mean   | 3.9015  | 3.8461 | 0.641        | .465          |
|                                       | SD     | .48716  | .43154 |              |              |
| Interpersonal relationship            | Mean   | 3.7451  | 3.7345 | 0.105        | .764          |
|                                       | SD     | .45615  | .43812 |              |              |
| Performance appraisal system          | Mean   | 3.0116  | 3.0235 | 0.245        | .607          |
|                                       | SD     | .53154  | .47842 |              |              |
publicized in the eye-catching position of the organization, so as to make the standardized teaching of the organization go better and better.

(2) According to the characteristics of music teaching, music education is used to guide the rules in teaching. Music teaching is different from other traditional subjects. Music education is an art discipline which integrates theory, skill and inspiration. In teaching activities, we should seriously abide by this principle, uphold the true meaning of music art and realize the teaching method of integrating quality and hobby. With the help of the current developed Internet technology, students’ learning time and space are open, breaking the traditional fixed-point learning. The current measures mainly include the following aspects. For example, in this guideline, it is necessary to clearly stipulate the teaching advertising of institutions and publicize the class hour standard and floating mechanism of various subjects in institutions. For example, it is necessary to open a professional website of music education institutions and transfer relevant information to the Internet, so that students and parents can have relevant information available. We should also publicize the government’s support policies for running schools. The internal affairs of running a school, the level of teachers’ professional titles, salary standards and welfare should be formulated in detail and made into a volume, so as to be traceable.

| Table 2 | Analysis of variance of age on each variable |
|---------|------------------------------------------------|
| Factor                          | < 25 | 26–30 | 31–40 | 41–50 | >50 | F test | Significance |
| Salary                          | Mean | 3.2213 | 3.649 | 3.8934 | 4.0093 | 4.0994 | 3.481 | .005 |
|                                  | SD   | .68104 | .49901 | .42551 | .41557 | .51731 |
| School system                   | Mean | 3.8746 | 3.3481 | 3.4841 | 3.5154 | 3.9971 | .953  | .453 |
|                                  | SD   | 1.05481 | .51687 | .67124 | .40152 | .59712 |
| Professional development        | Mean | 3.6698 | 3.1541 | 3.3157 | 3.6418 | 3.9981 | 11.124 | .000 |
| opportunities                  | SD   | .95411 | .74516 | .62158 | .53497 | .64518 |
| Professional power of teachers  | Mean | 3.4587 | 3.5815 | 3.9841 | 3.3487 | 4.5481 | 11.005 | .000 |
|                                  | SD   | .61548 | .48981 | .46615 | .30549 | .40534 |
| Interpersonal relationship      | Mean | 3.5148 | 3.4871 | 3.6841 | 3.7491 | 3.9418 | 5.607  | .000 |
|                                  | SD   | .57156 | .34468 | .47168 | .39715 | .52167 |
| Performance appraisal system    | Mean | 3.6784 | 3.9561 | 3.0548 | 3.1648 | 4.3548 | 5.157  | .000 |
|                                  | SD   | .58491 | .46187 | .45715 | .38491 | .50779 |

| Table 3 | Analysis of variance of educational background on each variable |
|---------|---------------------------------------------------------------|
| Factor                          | Undergraduate | Master | F test | Significance |
| Salary                          | Mean | 3.8154 | 3.6812 | 3.813 | .031 |
|                                  | SD   | .54114 | .54033 |
| School system                   | Mean | 3.6481 | 3.5187 | 2.615 | .054 |
|                                  | SD   | .41502 | .51240 |
| Professional development        | Mean | 3.6984 | 3.6991 | 2.351 | .081 |
| opportunities                  | SD   | .71564 | .69415 |
| Professional power of teachers  | Mean | 3.6451 | 3.1540 | 0.716 | .107 |
|                                  | SD   | .46812 | .47152 |
| Interpersonal relationship      | Mean | 3.8170 | 3.7054 | 0.730 | .513 |
|                                  | SD   | .46971 | .43150 |
| Performance appraisal system    | Mean | 3.4619 | 3.3157 | 5.157 | .027 |
|                                  | SD   | .43510 | .51200 |
their posts in the music institution. This kind of assessment method not only gives the institution the choice of an excellent teacher, but also has sufficient guarantee for the students’ learning and education quality. In addition, the music teaching institutions also need to strictly implement the reward and punishment system for teachers. It is not only necessary to give teachers material rewards, but also to give them spiritual rewards, such as the joint exchange between teachers and teachers of various excellent institutions, learning knowledge, etc., so as to build a platform for teachers to “recharge and refuel” themselves. It will also prevent the loss of excellent teachers. At the same time, a behavioral manual should be established to record the teachers’ bad behaviors. Once some of the limitations are exceeded, they need to be punished (Beygi Heidarlou et al. 2020). At the same time, we should evaluate the teachers in many aspects and promote the teaching quality through the evaluation of all aspects. The quality of teachers is the fundamental part of music education institutions, and the teaching quality of teachers also ensures the good reputation of the institutions.

The management of its own should develop to scientific network

After the management system and workflow are standardized, the daily operation and teaching quality work return to the right track. With the development of management science and the popularization of network life, management means should be promoted to scientific management. The scientific network of management means is realized by means of network multimedia classroom, intelligent teaching robot and OA information platform. This not only realizes the convenience of management, but also provides data reserve for the summary and development of teaching quality in the future (Adeyeri et al. 2020).

Most of the internal education management in music education is quite disorderly, which is related to the industry environment factors, but to some extent, there are subjective factors of music education institutions. Therefore, under the influence of subjective and objective factors, only if the teaching institutions constantly regulate teaching behavior and expand the social influence of teaching ideas of social music teaching institutions can they create more competitive and bright prospects for themselves in a complex environment (Cheng et al. 2020). The norms should include teachers’ professional quality, teaching thought, teaching ability, teaching effect, teaching attitude and teaching ability, etc. For example, the norms in the professional quality of teachers require teachers to have deep professional knowledge, enough knowledge of the disciplines taught, solid educational knowledge and communication and integration ability. Teachers’ teaching ideas should establish correct world outlook, life outlook and values and have clear teaching purpose, correct attitude, study business, hard work, etc. In terms of teaching ability, we should grasp the direction and key points of music teaching materials correctly and design the teaching methods mainly for students (Erdem et al. 2014).

### Strategies to improve music teachers’ teaching satisfaction

The system ensures the salary and welfare of teachers, and ensures the fairness of performance evaluation. According to the results of the questionnaire survey and interview, high school music teachers in some areas said: the salary and welfare are relatively acceptable, generally satisfactory, especially in the year-end performance evaluation, there is a big gap and the income of music teachers is the lowest (Adnan et al. 2018). The reason for narrowing the gap is that the wage benefit is the most basic factor affecting teachers’ job satisfaction. In order to gradually stabilize the situation, it is necessary to establish a relevant assessment and assessment system. From a macro point of view, the central government will increase its support for rural workers, implement policies and take relevant

| Table 4 | Variance analysis of title to variables |
|---------|---------------------------------------|
| Factor                           | Unrated teacher | Elementary teacher | Intermediate teacher | Advanced teacher | $F$ test | Significance |
| Salary                           | Mean 3.5581     | 3.6518             | 3.7817               | 3.9812           | 3.648    | .004 |
|                                  | SD .56710       | .49715             | .58915               | .57133           |          |      |
| School system                    | Mean 3.3518     | 3.4568             | 3.5847               | 3.6849           | 2.971    | .029 |
|                                  | SD .65187       | .49418             | .60371               | .56971           |          |      |
| Professional development         | Mean 3.5187     | 3.6881             | 3.6897               | 3.7451           | 11.571   | .000 |
| opportunities                    | SD .82315       | .55721             | .69874               | .54812           |          |      |
| Professional power of teachers   | Mean 3.1504     | 3.6841             | 3.6710               | 3.9681           | 11.247   | .001 |
|                                  | SD .48971       | .41671             | .41671               | .51781           |          |      |
| Interpersonal relationship       | Mean 3.6891     | 3.5187             | 3.4817               | 3.3487           | 4.672    | .000 |
|                                  | SD .41912       | .41671             | .44671               | .55413           |          |      |
| Performance appraisal system     | Mean 3.3487     | 3.5481             | 3.6417               | 3.3671           | 5.201    | .000 |
measures (Huang et al. 2020). In order to reduce the difference between regional wages and welfare, the education in rural areas can keep up with the pace of overall development, avoid the embarrassment of shortage of teachers and take the responsibility of the country in education. Education is the cornerstone of the steady development of the country, with the guiding and overall role, to protect the legitimate rights and interests of teachers, to solve the worries of teachers, so that teachers can devote themselves to teaching activities and feel their own social value, and finally realize the steady improvement of national quality (Bahrami et al. 2019).

Conclusion

Based on the design of a high integration SOC application processing chip based on the ARMA9 core, this paper designs a SoC system architecture based on the ARM multi-core processor, completes the front-end system design of SOC and carries out system level function simulation verification and FPGA prototype verification. Through the in-depth study of the teaching mode, this paper puts forward the improvement measures to adapt to the development. The introduction of these improvement measures has a good promotion to the development of music teaching. Music education plays an important role in improving the quality of Chinese national music. In the process of national music education, music education not only improves the national music esthetic but also creates more opportunities and platforms for everyone to learn music. In music education, we must keep in mind the principle of the combination of popularization and promotion, so as to achieve the purpose of quality education and esthetic education, and cultivate and improve students’ music ability in all aspects.

Declarations

Conflict of interest The authors declare that they have no competing interests.

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