Hindawi
Security and Communication Networks
Volume 2023, Article ID 9758342, 1 page
https://doi.org/10.1155/2023/9758342

Retraction

Retracted: Intelligent Assessment of Mental Health Based on IoT Data

Security and Communication Networks

Received 25 July 2023; Accepted 25 July 2023; Published 26 July 2023

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] H. Luo, "Intelligent Assessment of Mental Health Based on IoT Data," *Security and Communication Networks*, vol. 2022, Article ID 4656085, 6 pages, 2022.

Hindawi
Security and Communication Networks
Volume 2022, Article ID 4656085, 6 pages
https://doi.org/10.1155/2022/4656085

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Research Article

Intelligent Assessment of Mental Health Based on IoT Data

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Received 28 June 2022; Revised 14 July 2022; Accepted 29 July 2022; Published 19 August 2022

Academic Editor: C. Venkatesan

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In order to solve the problem of the accuracy of mental health assessment of college students, the author proposes an intelligent assessment system for mental health based on IoT data. In order to improve the evaluation effect, the author based on the original student mental health crisis counseling risk evaluation system designs a new risk assessment system for student mental health crisis counseling. The system hardware section mainly optimizes the design of the main control chip and the minimum system circuit. At the same time, a psychological counseling risk calculation model is built to realize the process of quantifying the risk value. The membership degree of the risk value is calculated using the basic principle of fuzzy logic, and the evaluation result is introduced into this part of the calculation to obtain an accurate evaluation level. The evaluation accuracy of the design system can reach up to 99%, and the detection time is as low as 5 s, which greatly improves the evaluation performance. The use of the design system is better than the evaluation system currently in use.

1. Introduction

The accelerated pace of globalization, the rapid development of information, and the openness of information have increased the psychological pressure of college students, and students are prone to psychological problems when they cannot solve psychological pressure, and the mental health of college students has received extensive attention [1]. As a critical period for the formation of college students' world outlook, outlook on life, and values, college life directly affects a person's future direction; correspondingly, college students' mental health is getting more and more attention. Only by maintaining a healthy mind can we meet the basic requirements of the country's new talents. However, with the deepening of economic globalization, under the rapid development of science and technology and information, the open information age has brought people a broad vision and convenient information sources but also brought unprecedented pressure to contemporary college students, leading to the emergence of certain mental health problems.

At present, the focus of attention on the mental health of college students mainly lies in the collection of psychological information and psychological expansion training, but there is a lack of an effective mental health assessment model; as a result, it is difficult for college counselors and tutors to grasp the real psychological state of college students in a timely manner [2]. For college students, when they enter the university gate, they also step into the gate of society. Therefore, the impact of the social environment on the psychology of college students is very obvious. The social environment is changeable, the social value and the social culture are multilayered, and college students are in the initial formation period of the "three views," which are easily eroded by some negative cultures. On the one hand, while the emergence of new media has enriched the lives of college students, it has also brought many negative effects, such as addiction to online games, improper social communication, and the emergence of criminal acts such as pyramid schemes, all having a certain impact on the psychology of college students, resulting in the emergence of negative and even violent behavior. On the other hand, the gradual trend of showing off wealth in the society has caused college students to lose themselves in life, blindly follow the trend, and regard luxury and comparison as their first value orientation, which greatly affects the mental health of colleges [3].

Personal development is a direct factor in determining one's own mental health. Good self-control, self-control, and self-discipline can help a person form a good value

orientation. However, real self-discipline is difficult to maintain, especially for the tempting college life, the most obvious phenomenon is mobile phone dependence. With the development of communication networks in the 5G era, many college students regard mobile phones as the other side of themselves, resulting in serious mobile phone dependence. Relevant studies have shown that excessive use of mobile phones can cause dizziness, headache, arm numbness, emotional anxiety, and other physiological problems, which directly affect the physical and mental health, academic, and interpersonal communication of college students. With the deepening of economic globalization, under the situation of rapid development of science and technology and information, the open information age not only brings people a broad vision and convenient information sources but also brings unprecedented pressure to contemporary college students, leading to certain psychological problems and the emergence of health problems [4].

2. Literature Review

Although in surveys and individual assessments of college students' mental health, psychological tests are widely used as a standardized assessment tool, but the results are not significant, and many psychological problems are still not detected early. There are many reasons for this outcome, such as the failure of students to provide real and reliable information, the poor reliability and validity of the test, and the complexity of the psychological problems themselves, among which the failure to effectively utilize the inherent information of the test is also an important reason. Therefore, in the individual psychological assessment, how to use the information provided by the test accurately and effectively by mathematical means and improve the recognition rate of psychological problems is an important problem faced by college students' mental health care and promotion [5].

Mental health assessment and psychological problem identification are inherently pattern recognition or nonlinear classification problems. The psychological state of each independent individual is a multi-dimensional information system whose basic characteristics are multi-variable, multi-level, and strong coupling, and there are complex nonlinear interactions among various factors within the system; therefore, it is difficult to describe with traditional mathematical methods. In order to effectively use the test information to improve the recognition rate of college students' psychological problems, it is necessary to establish a more scientific mental health state recognition model [6].

Risk assessment of mental health crisis counseling is to observe the specific behavior of students through strict environmental control and to conduct data analysis and evaluation according to the characteristics of psychological changes in the process of behavior. Because each person reacts differently to things, and their psychological changes are also different and the attitude and motivation shown are very different. The task of risk assessment of mental health crisis counseling is to study the different psychological states of different students and to guide them to participate in corresponding social activities by grasping the laws of their psychological behavior, so that students can finally achieve the goal of physical and mental health [7].

To sum up, according to the specific needs of college students' mental health crisis counseling work, digital multimedia means are used to optimize the design of their mental health problem assessment system, in order to more effectively improve the students' mental health level.

3. Methods

3.1. Hardware Design of the Risk Assessment System for Students' Mental Health Crisis Counseling. Through a comprehensive study of the original risk assessment system for students' mental health crisis counseling, the design of each link of the system is further optimized [8], and the original system hardware environment is optimized; the optimized system hardware framework is shown in Figure 1.

The system hardware frame design, as the basis of the whole system design, is an important guarantee for the normal operation of the whole system [9]. According to the design of the system hardware architecture, the internal hardware environment architecture is further optimized, and the optimization of the entire system process is completed.

3.1.1. Selection of Main Control Chip. The main control chip (MCU) is the core of the risk assessment system for students' mental health crisis counseling, which is equivalent to the human brain [10], it controls the entire risk assessment system, mainly converting the collected analog signals into data signals without interruption, the collected data signals are digitally filtered and transmitted [3]. MCU has the advantages of small size and low power consumption, it can use one or more USART communication interfaces carried by itself, and the high-frequency processing speed is used to collect and digitally filter the signal, which reduces the configuration of the underlying registers to a certain extent [11]. MCU has multiple built-in A/D converters, which use a higher clock frequency to convert analog signals with a resolution greater than 16 bits into data signals, and can complete the corresponding functions through fewer peripheral circuits, reduce the possibility of problems during transmission, and improve the stability of performance. The specific internal structure of the MCU is shown in Table 1.

The 48 pins of the chip are used to connect with peripheral circuits, and the preset of 28 I/O pins reduces the difficulty of system software programming, thereby improving the optimization effect of the entire system [12].

3.1.2. Minimal System Operation Circuit Design. As the processing core of the digital circuit, MCU can issue instructions to the entire system hardware [13]. The smallest system of MCU consists of reset circuit, power supply circuit, crystal oscillator circuit, and program circuit. The reset circuit ensures that MCU returns to its initial state if it throws a given range. The crystal oscillator circuit ensures that accurate internal and external clock sources are provided to the MCU circuit. The program circuit imports the

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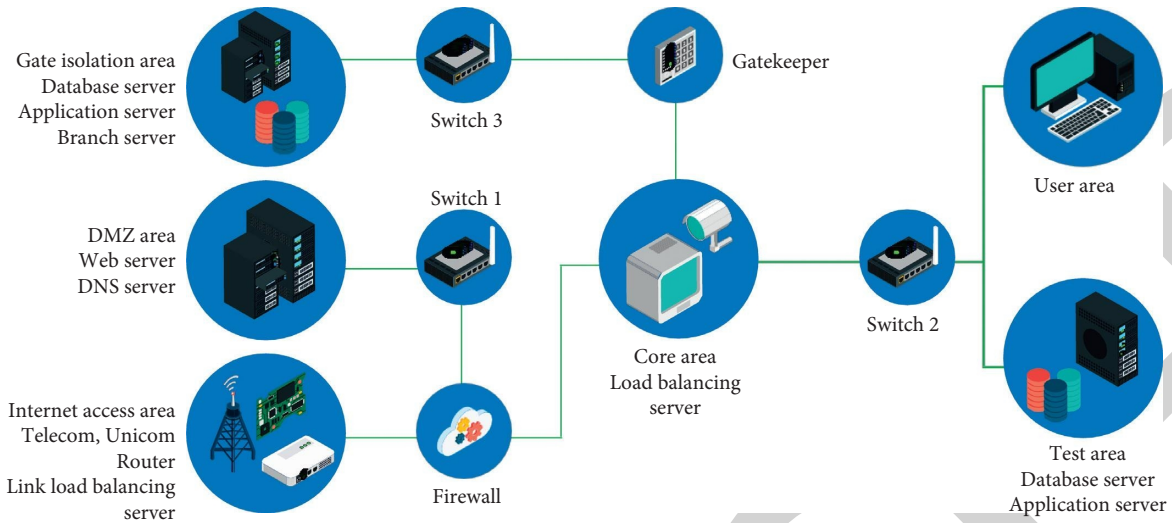

Figure 1: System hardware environment deployment architecture diagram.

Table 1: MCU internal composition table.

Serial number	Parameter name	Parameter model
I	CPL	ARM 64 bit Cortex^{TM} – M3
2	Memory	128 KB flash program memory
3	Clock	4~16 MHz crystal oscillator
4	UASRT interface	4 ports
5	A/D conversion	12 bit analog converter
6	Timer	Dual independent watchdog timers
7	DMA	8-channel DMA controller

program into the MCU interface to ensure the normal operation of the MCU chip.

The MCU circuit uses a 32 MHz external crystal oscillator source that can improve the accuracy of the system clock. Using the SWD method to combine the 8 pins in the chip, in order to ensure the normal operation of the MCU clock, the embedded programming code is imported into the chip through SWDIO, and the waveform is displayed in combination with the OLED circuit [14]. The chip combines the minimum system and resistance to transmit the collected analog signal into the converter and converts the collected analog signal through an uninterrupted cyclic scanning method.

Integrate the hardware part of the system set above with the original system equipment, complete the installation of the hardware part of the student mental health crisis counseling risk assessment system and ensure the development of the system software part.

3.2. Software Design of the Risk Assessment System for Students' Mental Health Crisis Counseling

3.2.1. Construction of the Risk Calculation Model for Psychological Counseling. In this design, an interdisciplinary approach is used to quantify the risk of students' mental health crisis counseling, according to the characteristics of this research object, the risk calculation model in the information security risk assessment guide is used as the risk in this system design, a blueprint for the evaluation model, the specific risk calculation formula (1) is as follows:

$$\begin{aligned} A &= f(B, C, D) \\ &= f(E_i, G(J_i, D)). \end{aligned} \tag{1}$$

In formula (1), A represents the student's mental health crisis counseling risk; B represents the counseling method; C represents the student's mental health vulnerability; D represents the student's mental health risk threat factor; E_i represents the degree of impact of risks on students; G represents the student's own health level value; and J_i represents the vulnerability of the tutoring process itself [15].

In the process of using this calculation model, in order to ensure the reliability and authenticity of the model calculation results, the reasons for the risk after counseling are attributed to several aspects, that is, the importance of coaching, the likelihood of risk events, and the consequences of risk events. Therefore, the risk calculation formula in formula (1) can be derived as follows:

$$A = f(T, W, V). \tag{2}$$

In formula (2), A represents the quantified risk value; T represents the length of time students receive tutoring; W represents the degree of impact of the students after the risk event occurs; and V represents the probability of the risk event occurring. According to the risk calculation method, the impact value of the risk event and the possibility of the event occurrence can be expressed in the form of multiplication or addition, and the quantitative result of the risk event can be obtained in the form of an increasing function.

According to the management between A, T, W, and V in the above function, the quantization result is obtained by multiplying:

$$A = T \cdot W \cdot V. \tag{3}$$

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Use (3) to obtain the overall risk calculation formula and combine it with the original risk research method, use a more appropriate method to find the value range of T, W, and V, and obtain a scientific T, the quantitative units of W and V, and then the quantified risk value A [16].

3.2.2. Psychological Crisis Counseling Risk Assessment. In this design, the basic principles of fuzzy logic are used as the main method for psychological counseling risk assessment. Assuming that there is a corresponding mentoring domain G in the risk set X and there is $g \in G$, then the characteristic function of G is f_g; then this function can satisfy the following conditions:

$$f_g: G \longrightarrow \{0, 1\}, \tag{4}$$

$$g \longrightarrow f_g = \{g_0 \notin X, g_1 \in X\}. \tag{5}$$

Equations (4) and (5) adopt some concepts of classical sets, and the characteristic function of X can be expressed as the degree of membership to G when the value of f_x is x. Therefore, for any $g \in G$, there will be a corresponding $g \in f_x$ or $g \notin f_x$. According to this theory, the risk value of counseling work can be converted from the traditional {0,1} value range to a closed value interval [0,1], after the above processing, the characteristic function of the risk value can be transformed into a membership function $\alpha_x(g)$, the specific formula is as follows:

$$\begin{aligned} \alpha_x(g): X &\longrightarrow [0, 1], \\ g &\longrightarrow \alpha_x(g). \end{aligned} \tag{6}$$

In the above calculation process, natural things are mainly studied and processed, in order to improve the accuracy of counseling risk assessment, in this study, the original risk assessment method was applied [17]. Let the evaluation result of the original evaluation method be S, which can be corresponding to t, p, q, and $t \neq p \neq q$; then the evaluation result can satisfy the following conditions:

$$f_x(G) = \begin{cases} \dfrac{g - t}{p - t}, & t \leqslant g \leqslant p, \\ \dfrac{q - g}{q - p}, & p < g \leqslant q, \\ 0, & \text{otherwise}. \end{cases} \tag{7}$$

Using the above formula (7), the membership degree of the risk assessment result is analyzed, and at the same time, the analysis result is output as the final result, in order to improve the reliability and authenticity of risk assessment. This part of the operation process is input into the system module in the form of programming.

By using the above programming content, the evaluation result is introduced into the above calculation link to complete the membership calculation process. The abovementioned design hardware and software are combined and integrated into the original evaluation system. So far, the relevant design of the risk evaluation system for students' mental health crisis counseling has been completed.

3.3. System Test Analysis

3.3.1. System Test Environment Design. In order to verify the use effect of the design system in the text, in this link, two common systems in the market are selected to compare with the design system in the text. In the comparative test of the three systems, it is necessary to set a reasonable test environment to ensure the stability of the test process. Therefore, the system test environment adopts a distributed architecture, including one server as the main node and three data processing servers as nodes, in order to achieve the efficiency and stability of data operation. The framework of the system test platform is shown in Table 2.

In this system test, the above test platform will be used to complete the test process to obtain the use effect of the author's designed system.

3.3.2. System Test Plan. In the process of this system test, the mental health crisis counseling courses for students obtained by a university were quantified and processed into the form of data, which were output to the test platform. Using the author's design system and the two evaluation systems currently in use, namely, a VPMCD-based mental health evaluation model for college students is system 1, and the system used in the evaluation of the mental health assessment scale for middle school students from the perspective of positive psychology is system 2, the risk situation in the above target data is evaluated and analyzed, as shown in Figure 2. In this system test, the risk value calculation result, the evaluation level query accuracy, and the system evaluation processing time are used as the comparison indicators in the test. In this system test, multiple tests will be used to improve the accuracy of the comparison. Use the system test scheme set above to complete the system test and obtain valid system test analysis results [18].

It can be seen from the above test results that the author's design system has a high reliability of the calculation results of the risk value. According to the test results of the system, it can be seen that the calculation results of the risk value of the system designed by the author are relatively stable, in the process of multiple calculations, the calculation accuracy is maintained above 98% for a long time, and the fluctuation range is small, and it can be seen that the calculation reliability of this system is high. Compared with the calculation results of the risk value of the system designed by the author, it can be seen that the calculation results of the risk value of the two systems currently in use fluctuate greatly. According to previous researches, the risk assessment results are less likely to fluctuate greatly, so it can be seen that the current assessment system in use has poor ability to calculate the risk value.

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Table 2: System test platform architecture.

Name	Hardware configuration	Operating system
Main controller	8 core CPU 4 GB RAM 20 GB hard drive 2 MB bandwidth	Cent0S 7.0
Node 1	8 core CPU 4 GB RAM 20 GB hard drive 2 MB bandwidth	
Node 2	8 core CPU 4 GB RAM 20 GB hard drive 2 MB bandwidth	
Node 3	8 core CPU 4 GB RAM 20 GB hard drive 2 MB bandwidth	

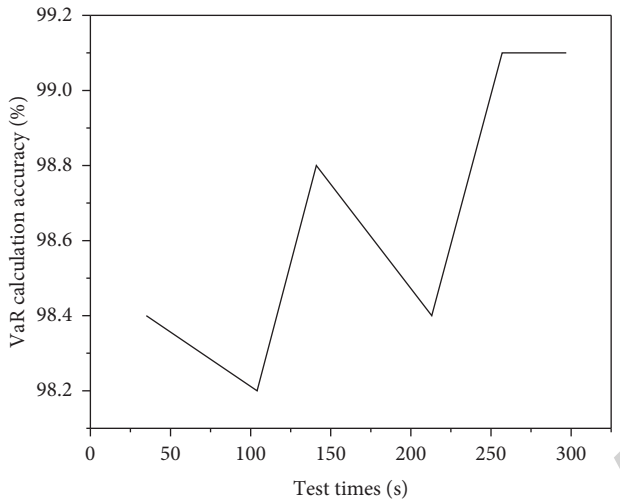

Figure 2: Comparison of VaR calculation results.

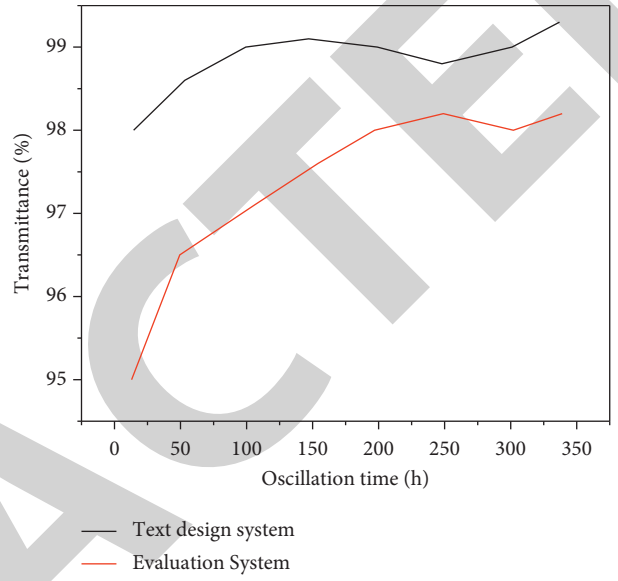

Figure 3: Evaluation level query accuracy test results.

4. Results and Discussion

According to the test results of the system evaluation level query accuracy in Figure 3, it can be seen that the evaluation level query accuracy of the system designed by the author is relatively high, upto 99%. This shows that the system has a strong ability to calculate the risk value, which ensures the high accuracy of the test results, by analyzing the two evaluation systems currently in use, it can be seen that due to the insufficient computing power of the risk value, the accuracy of the evaluation level query has been seriously affected, the query accuracy is low, and the system processing results are not highly reliable [19].

Based on the test results in Figure 4, it can be seen that the evaluation processing time of the system designed by the author is shorter than that of the system currently in use, and the evaluation can be completed within 5 s at the shortest. Through the comprehensive research and analysis of the risk assessment system, it can be seen that the module with the longest running time is the risk value calculation link, due to the strong ability to calculate the value of risk of the author's design system, in this round of testing, the author designed the system to have a shorter system evaluation processing time, risk assessment is more efficient [20].

It can be seen from the three parts of the test results of comprehensive risk value calculation, evaluation level query accuracy, and system evaluation processing time, the authors designed the system to perform better than the evaluation systems currently in use [21].

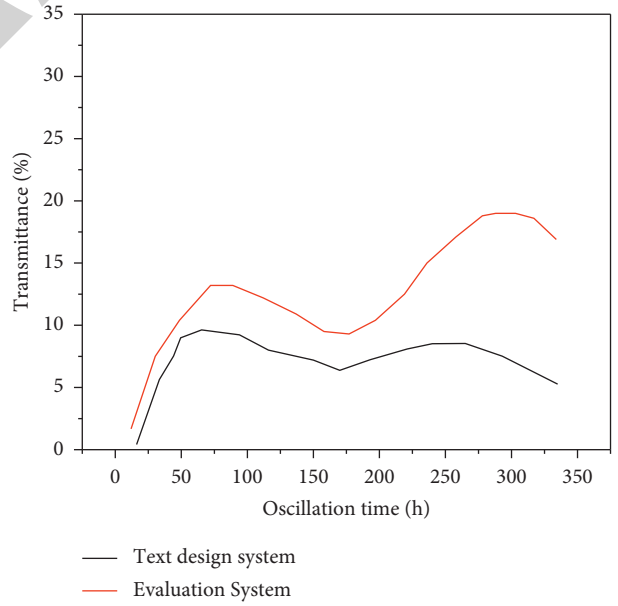

Figure 4: System evaluation processing time test results.

5. Conclusion

The author proposed an intelligent assessment of mental health based on IoT data, in order to detect students' psychological problems in time and avoid accidents, it is

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necessary to design a risk assessment system for students' mental health crisis counseling; therefore, on the basis of the original risk assessment system for students' mental health crisis counseling, a new risk assessment system for students' mental health crisis counseling is designed. First, the hardware part of the system is designed, then a psychological counseling risk calculation model is built, the process of quantifying the risk value is realized, and the risk value membership degree is calculated. Finally, the evaluation results are introduced into this part of the calculation, and the accurate evaluation level is obtained, so as to complete the design of the risk evaluation system for students' mental health crisis counseling.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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