

Retraction

Retracted: Legal Regulation of Artificial Intelligence and Digital Twin Decision-Making Risks in Mobile Edge Computing

Wireless Communications and Mobile Computing

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Wireless Communications and Mobile Computing has retracted the article titled “Legal Regulation of Artificial Intelligence and Digital Twin Decision-Making Risks in Mobile Edge Computing” [1] due to concerns that the peer review process has been compromised.

Following an investigation conducted by the Hindawi Research Integrity team [2], significant concerns were identified with the peer reviewers assigned to this article; the investigation has concluded that the peer review process was compromised. We therefore can no longer trust the peer review process and the article is being retracted with the agreement of the chief editor.

The author does not agree to the retraction.

References

- [1] Z. Wang, “Legal Regulation of Artificial Intelligence and Digital Twin Decision-Making Risks in Mobile Edge Computing,” *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 7943939, 11 pages, 2022.
- [2] L. Ferguson, “Advancing Research Integrity Collaboratively and with Vigour,” 2022, <https://www.hindawi.com/post/advancing-research-integrity-collaboratively-and-vigour/>.

Research Article

Legal Regulation of Artificial Intelligence and Digital Twin Decision-Making Risks in Mobile Edge Computing

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Information is the basis of decision security. In the era of big data, information is everywhere, and risks are everywhere. Information leakage incidents are frequently exposed, bringing many hidden dangers to users. While artificial intelligence brings convenience to people, it also inevitably brings crises. This paper aims to study the information security laws and regulations of users in the intelligent age and find the reasons for the leakage of user information. This paper proposes to calculate decision risk with the help of mobile edge computing technology. It builds a digital twin risk simulation model to make better risk decisions. The experimental results of this paper show that improving relevant laws and regulations can significantly reduce decision-making risks and improve decision-making efficiency by 20%.

1. Introduction

Mobile edge computing (MEC) is emerging as a computing model. It hopes to provide widespread computer and storage services for mobile and large data applications. As an extension of the cloud computing functionality to in-ear networks, laptop technology can support advanced in-network applications. It provides users with real-time services and resolves the high latency barriers of traditional cloud computing companies. It is a new technology with wide application expectations. In mobile edge computing, service allocation and service migration are two important means of service scheduling. The MEC server is very close to the user. It allows users to seamlessly access services running on edge devices, reducing information latency and decision risk. The deep learning calculation of artificial intelligence can effectively process information data and better play the value of numbers. Digital twin technology builds mirrored models to simulate how decisions work. It can better help enterprises make risk decisions and reduce hidden dangers. While we enjoy the convenience brought by information, the hidden dangers brought by information should not be underestimated. Every year, some enterprises suffer huge losses due to risky decision-making due to information leakage, a decline in output value. However, there are still gaps in

the current laws and regulations below the protection of information. Therefore, how to make better use of the advantages of high-tech while avoiding the information risk brought by high-tech and how to play the protection value of laws and regulations become the focus of future research.

This paper starts with research on reducing risk decision-making and uses mobile edge computing technology to reduce the delay of information acquisition. It exerts the dual value of artificial intelligence and digital twin to better help enterprises determine the risk of decision-making. At the same time, it also makes good use of laws and regulations to prevent decision-making risks, help enterprises optimize decision-making, and increase profits.

2. Related Work

Given the rules and regulations of risk-taking, domestic and foreign experts and professionals have achieved some results. The Zadeh A R study increased the growth and sustainable development of the company through investments. Therefore, improving productivity and profitability and reducing investment risk. Interviewed by 50 executives, professionals and industry experts. The typical analysis and confused results of DEMATEL technology show the impact of land and buildings, market value, and government rules

and regulations on projects such as financial risks, government restrictions, behaviors, people, infrastructure, and political risks [1]. He Z J investigates the role of monetary policy or regulatory framework and investigates whether this independence of interest rates has influenced commercial banks' aversion to risk. He noted that 18 commercial banks operated in China from 2003 to 2018. The findings suggest that China's interest rate liberalization reforms have had a positive effect on reducing banking risks, despite new correction risks. The risky potential of commercial banks is also enhanced by the adoption of China's monetary policy of interest rate independence and regulatory directives [2]. Cha E J uses the comprehensive insurance policy (CPT) to assess risk acceptance as reflected in US federal policy, especially in the proposed arrangements for dealing with public safety and health issues. Attitude towards risk is reflected in the prospects of the probability and consequences of a risk event or exposure to risk factors. It analyzed the 22 proposed strategies and found that the relative exposure risk that appears in each process revealed differences in risk behaviors [3]. The Tyler J study reduced the risk of flood control decision-making by assessing flood supervisors' perceptions of the quality of the local flood control decision-making process and collects data from interviews with 200 flood managers in the United States. The results show that many flood managers believe that the local flood control decision-making process is good. In the case of communities participating in the FEMA Regional Sustainability Program and areas with high flood concerns and low poverty rates, they are more likely to report better flood management decision-making processes [4]. Hintze develops how privacy laws can and should enable scientific research while providing effective protection for personal information. It discusses many important foundations in private law and how each can influence scientific research. It describes many popular privacy laws in different jurisdictions and how each law treats the study as data usage. The difference between education or public interest research and business research is a brief discussion. Finally, it provides specific advice to lawyers and regulators on how confidentiality should be dealt with and adopted in scientific research [5]. Kazuo explains the structure, significance, and scope of current Japanese legislation on the protection of private information and investigative procedures. It also reviews the provisions of the relevant rules/regulations for educational research purposes and uses the e-Gov database to incorporate relevant rules/regulations for medical research involving human subjects and related to the protection of private information and investigative procedures. His research shows that Japan's current legal framework for the protection of personal information can be defined as a "hybrid model" and that the relevant rules/regulations do not apply. In the context of the wider legislative process, due to the sensitivity and usefulness of private medical information, it is necessary to reconsider the protection of private medical information and its effective use [6]. Liu H researches Chinese ICV laws and regulations. After analyzing Canada's current laws related to smart cars, he describes the challenges that the current legal system must face in the following cases. The laws relating to smart cars

have not been amended, or new rules have been passed, and there are no rules or regulations governing ICV legal matters. It focuses on national and local government policies. The results show that processes at national and regional level are communicative and consistent. It formulates the basic principles of Chinese industry ICV by providing guidelines and implementing rules [7].

3. Introduction to the Principles of Mobile Edge Computing and Artificial Intelligence Digital Twin

3.1. Mobile Edge Computing. ETSI refers to the European Telecommunications Standardization Institute. It is recognized as a telecommunications standards association by CEN (European Association for Standardization) and CEPT (European Conference of Postal and Telecommunications Authorities). Its recommended standards are often adopted by the European Community as the technical basis for European regulations and are required to be implemented. As defined by ETSI, mobile edge computing provides application players and content service providers with cloud computing capabilities and their service environment at the network edge. It improves user experience by reducing network operation and service delivery delays [8]. Figure 1 shows the overall scheme of a mobile edge computing system.

Mobile edge computing forms an edge cloud by distributing cloud computing and storage functions to base stations or wireless network infrastructure. It provides nearby computing and storage services for user equipment near the edge of the wireless network to meet the needs of specific applications and services, for example, real-time, agility and security, and privacy protection. In addition, edge clouds can also be connected to private clouds within other networks (such as enterprise networks) to realize interconnection between private clouds and edge clouds. The main technical features of mobile edge computing are proximity, low latency, high bandwidth, location detection capabilities, and network context information [9]. Among them, proximity is the location of the MEC server very close to the end device. Therefore, mobile edge computing can provide services such as nearby high-performance computing, data analysis, or caching for terminal devices such as sensors, smartphones, and vehicles with limited resources.

At present, edge mobile computing is mainly used in scenarios with large amount of calculation, sensitive to delay, high real-time requirements, and large amount of data, such as VR, Internet of Vehicles, and online games. Edge mobile computing can efficiently deploy edge nodes, schedule edge resources, meet application requirements, and improve service quality.

In order to fully understand the inherent logic of the laptop, the portable computing edge system is vertically divided into three levels: terminal layer, edge layer, and intermediate cloud layer, as shown in Figure 2. Among these, the terminal layer mainly illuminates the wireless communication function between the mobile terminal and

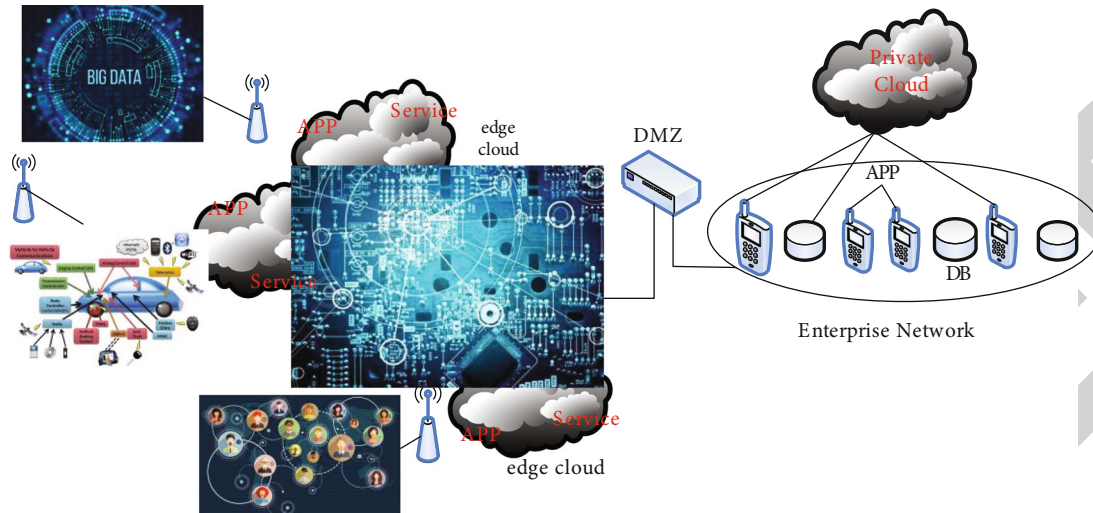


FIGURE 1: Overall system diagram of mobile edge computing.

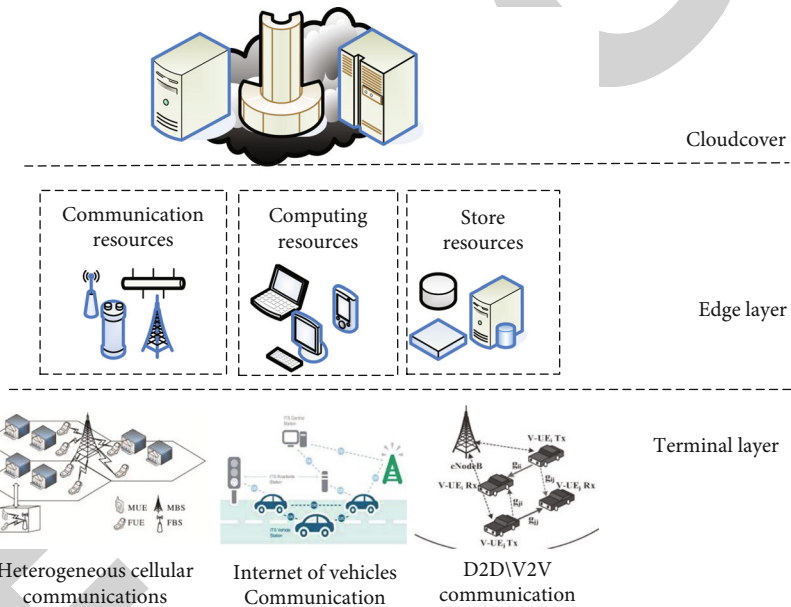


FIGURE 2: Vertical layered architecture diagram of mobile edge computing.

the wireless infrastructure. The edge level and cloud layer mainly reflect the computing and storage resources of the MEC server and the cloud computing company.

Mobile edge computing mainly involves computing migration and edge caching issues generated by computing and storage.

3.1.1. Computational Migration. Computation migration means that terminal devices can migrate computationally intensive and latency-sensitive computing tasks from local servers to edge servers with relatively abundant resources for processing. It can solve problems such as limited local computing resources and battery capacity. Decisions for computing migration include whether to migrate, the amount of computing tasks to migrate, and which MEC server to migrate

to. The calculation migration decision results can be divided into the following three [10], as shown in Figure 3:

Local calculation: the entire task is calculated in the local server of the terminal device. This situation usually occurs when the computing resources of the MEC server are unavailable, or the time corresponding to the computing migration is greater than the local computing time.

All migration: the terminal device migrates the entire task to the nearest edge server for processing to reduce the task completion delay and save its own battery capacity.

Partial migration: the terminal device divides the computing tasks, some tasks are migrated to the nearest edge server for processing, and the remaining tasks are calculated locally.

Computational migration decision problems are very complex. It needs to comprehensively consider factors such

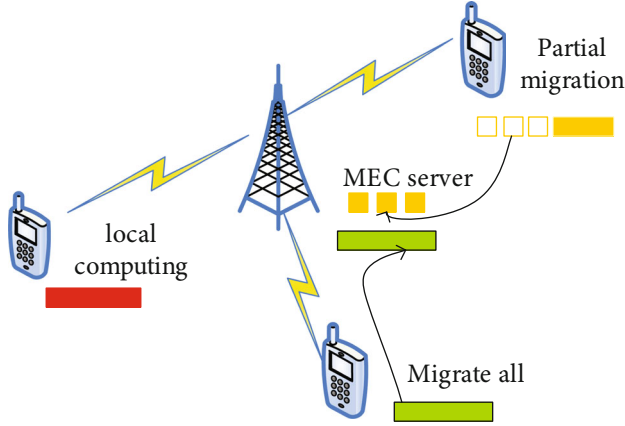


FIGURE 3: Computational migration decision types.

as user needs, communication link quality, and edge server computing resource capacity. Among the computational transfer decision problems, some transfer problems are difficult. It not only needs to consider whether to perform computing migration, but also consider the migration amount of computing tasks, and how many tasks to migrate. Usually, a computing task consists of multiple logically independent subtasks, and there are certain dependencies between subtasks, such as sequential execution, parallel execution, or mixed mode. The dependencies between subtasks will affect the completion delay of the final task, which should be taken into account when making the decision of computing migration strategy. This dependency between tasks adds to the complexity of the transfer decision problem to a certain extent.

3.1.2. Edge Caching. In mobile edge computing, both base stations and terminal devices are equipped with certain storage resources. The first thing to consider in edge caching is the choice of content storage location. Due to limited edge storage resources, the second issue to be considered by edge caches is that MEC servers should select which content to store. In order to make the content stored in the MEC server accessible to the nearest end users as much as possible, edge caching usually takes content popularity into consideration. Content popularity refers to the degree to which content can gain the attention and respect of users. It concentrates on how people click traffic.

In traditional cloud computing, since the service is provided by the data center in the cloud, the user's service experience is closely related to the quality of the connection between the user and the cloud. In other words, traditional cloud computing is difficult to make targeted optimization for user mobility. At this time, service migration technology is usually used to optimize the performance within the data center, such as load balancing and service consolidation. In mobile edge computing, MEC servers are usually used to provide users with corresponding services. At this time, the user's movement will obviously affect the service quality, so service migration technology can be applied to optimize the user experience.

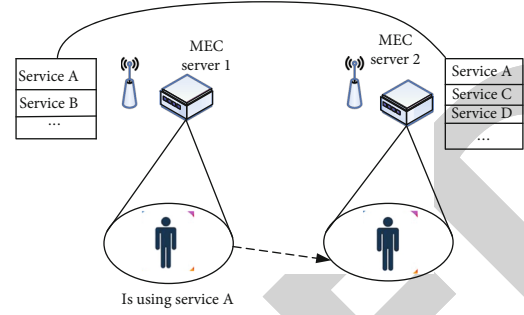


FIGURE 4: Schematic diagram of service migration scenario under MEC.

The typical migration of service under laptops is shown in Figure 4. A mobile user who has access to server MEC 1 receives service A. In addition to service A, server MEC 1 can also run other services for other users at the same time. As the user moves, the communication space between user and service A becomes larger. To ensure the quality of the service, we also switched the service from server MEC 1 to server MEC 2, respectively. After completing project A migration, the user does not need to receive function A through MEC server 1 but can communicate function A through server MEC 2. In the job transfer process, it is understood that the best approach should be to shorten the communication space between user W and the function; otherwise, there should be no optimal procedure.

With the help of virtual machine dynamic migration technology, under mobile edge computing, service migration can realize the idea of "service follows user." It means that the service can move as the user moves [11]. Although this is a very advanced idea, it still faces problems in practical implementation. This is because service migration is often accompanied by corresponding migration overhead, and in some practical scenarios, there will still be a short-term service interruption phenomenon. Migration overhead refers to the overhead caused by thread or process migration between two logical CPUs during thread or process scheduling.

3.2. Metrics for Service Migration Problems

3.2.1. Communication Overhead and Migration Overhead. It has been reported that the communication space between the user and the service used is l . For simplicity, this document takes the communication delay between the user and the service as an indicator for calculating the user experience and assumes that the communication delay is proportional to the communication distance. Then the communication delay cannot be expressed as

$$k_{xy} = \alpha l_{xy}, \quad (1)$$

where l_{xy} is the distance between subregion x and subregion y and α is a proportional coefficient. That is to say, in terms of service quality, the MEC server in the area where the user is located is the best choice.

Due to the different factors involved in the practical scenario, a simple distance-cost model may not represent all the conditions. Therefore, the cost function is defined in the form of a probabilistic model. In addition to proximity to the actual site, this functional format can also easily find a better solution [12], so that an appropriate transition decision can be made more efficiently. Top-down communication is defined as follows:

$$kx_1(l_{xy}) = \begin{cases} \lambda_a + \lambda_b \omega^{l_{xy}}, & \text{if } l_{xy} > 0, \\ 0, & \text{others.} \end{cases} \quad (2)$$

Along with service migration, there will be corresponding transmission overhead of user data and user status. Similarly, this paper defines this overhead as

$$kx_2(l_{xy}) = \begin{cases} \gamma_a + \gamma_b \mu^{l_{xy}}, & \text{if } l_{xy} > 0, \\ 0, & \text{others.} \end{cases} \quad (3)$$

In the above formula, $\lambda_a, \lambda_b, \omega, \gamma_a, \gamma_b, \mu$ are all real-valued parameters, and (2) and (3) are both increasing functions of distance. That is, as the distance increases, the communication overhead and migration overhead will increase accordingly. Therefore, in order to satisfy this property, this paper restricts the parameters by

$$0 \leq \omega \leq 1, \lambda_a \leq 0, \lambda_b \geq -\lambda_a, \quad (4)$$

$$\gamma_a \geq 1, \mu \geq 1. \quad (5)$$

You can see from (4) to (5) that migrating services can reduce communication between platforms between users and services. However, the cost of a migration will be proportional. Therefore, constantly moving as users move is not the best option. In this document, the time point of each decision-making action is defined as t , and the actions that can be taken during t can be representative by set $D = \{t_0, t_1\}$, where t_0 means choosing not to perform service migration and t_1 means migrating the service to the user's current location.

The term bandwidth originally referred to the width of the frequency band of electromagnetic waves, that is, the difference between the highest frequency and the lowest frequency of the signal. Currently, it is more widely used in digital communications. It is used to describe the maximum rate at which a network or line can theoretically transmit data. Once you decide what to do, it can cause many status changes, such as communication delays, downtime, server capacity, and bandwidth. And state changes caused by different behaviors often vary [13]. In order to quantify different behaviors on a scale, this article introduces a useful function as

$$sy(x, y, t) = \beta_1 kx(l_{xy}) - \beta_2 kx(l_{xy}). \quad (6)$$

That is, when the corresponding behavior t is taken, the benefit obtained by the behavior by changing the communi-

cation overhead and the migration overhead is considered. Since these two costs will increase with the increase of distance, this paper takes the difference between the two as the benefit of action adjustment, where β_1, β_2 is the correction coefficient, which is used to adjust the weight between two different costs.

3.2.2. Target Server Status. Although in terms of service quality, the MEC server is the area where the user is the best choice, in practical cases, however, the destination server may not be able to accommodate the current job migration (for example, residual capacity and bandwidth are not sufficient to support the ongoing job to be completed). Therefore, the state of operation of the site server is also one of the indicators that must be taken into account when deciding on a job relocation.

Here, the bandwidth and storage capacity occupied by service m are defined as e_m, f_m , respectively. The current available bandwidth capacity of the server is E and F . Then a migration action of service m from source server q to destination server p will produce the following changes.

$$E_q = E_q + e_m, \quad (7)$$

$$E_p = E_p - e_m, \quad (8)$$

$$F_q = F_q + f_m, \quad (9)$$

$$F_p = F_p - f_m. \quad (10)$$

You can see that when a service leaves the source server, the source server may free up the storage and bandwidth that the service originally owned. The server to which the service will go must be part of the storage and bandwidth to receive the service.

3.2.3. Movement Direction. It represents the user transport direction (from the source area to the destination area), as shown in Figure 5.

The angle between the two vectors can be further represented by the cosine value of the moving vector direction.

$$\cos \theta = \frac{\vec{g}_t \cdot \vec{g}_{t-1}}{|\vec{g}_t| |\vec{g}_{t-1}|}. \quad (11)$$

As a special case, in this paper, when t is 0, denote $\vec{g}_t = \vec{0}$, and let $\cos \theta = 0$ at this time, so as to not exert the influence of the moving direction on the income function at the initial moment.

3.2.4. Optimization Goals. After considering the above indicators, the revised profit function can be expressed as

$$sy(x, x', t) = \beta_1 kx_1(l_{xx'}) - \beta_2 kx_2(l_{xx'}) + \beta_3 (E_q + F_q) + \beta_4 \cos \theta, \quad (12)$$

where x represents the current state and x' represents the target state reached after taking the action. $\beta_1, \beta_2, \beta_3,$

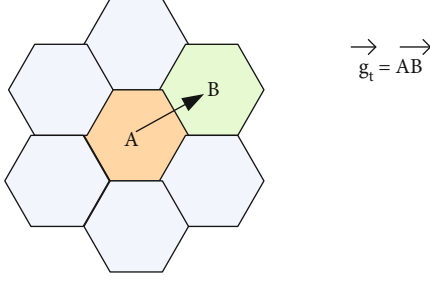


FIGURE 5: Schematic diagram of moving direction vector.

β_4 is still a correction coefficient, which is used to correct the offset problem caused by different value ranges of different items. For example, the range of the cosine term of the moving direction is $[-1, 1]$. The value of the current available bandwidth resource and available space resource item of the target MEC server is much larger than this value [14].

At time T , the optimal analysis of the immigration decision designed u can be expressed as

$$R_u(z_0) = \max \left\{ \left(kx_T + \sum_{t=1}^{T-1} \kappa^t kx_t \right) | z_0 \right\}. \quad (13)$$

It tends to reduce the impact of revenue performance to previous levels. Except for all cases after the initial stage, they are

$$R_u(z_0) = \max \left\{ \lim_{T \rightarrow +\infty} \sum_{t=1}^{T-1} \kappa^t kx_t | z_0 \right\}. \quad (14)$$

As shown in Figure 6, during user mobility modeling and migration allocation decision, state statistics are performed at each time t , and corresponding actions are given according to the migration decision.

When a mobile terminal has a functional relocation requirement, an access point with minimal network latency is selected first. Second, it is necessary to judge whether the number of MEC servers at the access point is 1. If it is 1, the MEC server is selected. However, according to the parallel supply and demand theory and the energy value model, the conversion rate of the balance is calculated using the MEC server source before and after the relocation and used to display how the resources required by tasks are available in our resources on the MEC server. Then, according to the correlation between supply and demand and power consumption, the costs associated with the balance are divided by the MEC server. The classification is done on each MEC server, and finally the heaviest MEC server is selected by the end of the trip. The selected MEC server is used to perform the operation and return the result to the mobile terminal.

The rate of change of resource utilization balance is used to represent the similarity between task demand and service node capacity. For the convenience of description below, firstly define the resource utilization standard deviation

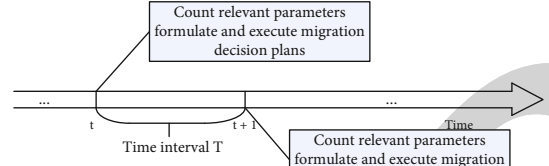


FIGURE 6: User mobility modeling and migration allocation decision arrangement.

(RUSD), the resource utilization balance degree (RUBD), and the change rate of resource utilization balance degree (CRRUBD) [15].

(1) *RUSD*. It represents an understanding of the use of multidimensional sources on an ear computer laptop. The lower the value, the more balanced the use of different resources. The formula for calculating the standard deviation for using x th MEC server resources is as follows:

$$RUSD_x = \sqrt{\frac{1}{L} \sum_{l=1}^L (v_x^l - v_x^{avg})^2}, \quad (15)$$

$$v_x^{avg} = \frac{1}{L} \sum_{l=1}^L v_x^l. \quad (16)$$

However, further deployment is not actually possible due to the small remaining amount of this resource. Therefore, the resource balancing ratio (RB) should be used to limit excessive resource usage in one dimension. The formula for calculating the resource balance on the x th server is as follows:

$$RB_x = \frac{v_x^{avg}}{\max_{l \in \{1, \dots, L\}} v_x^l}. \quad (17)$$

In the formula, the value of RB_x is less than or equal to 1, and $\max_{l \in \{1, \dots, L\}} v_x^l$ represents the maximum value of multidimensional resource utilization. When r is close to RB_x , it means that the effect of restricting the excessive utilization of a certain resource is better.

(2) *Resource Utilization Balance Degree (RUBD)*. Considering the standard deviation of resource utilization and resource utilization, the formula for calculating the resource utilization of the x th MEC server is as follows:

$$RUSD_x = \frac{RB_x}{RUSD_x}. \quad (18)$$

(3) *Change Rate of Resource Utilization Balance Degree (CRRUBD)*. According to task resource requirements, evaluate the resource utilization balance $RUBD_x^{after}$ after tasks are allocated to the MEC server. The formula for calculating the

rate of change of the resource utilization balance of the x th MEC server is as follows:

$$CRRUBD_x = \frac{RUBD_x^{after} - RUBD_x}{RUBD_x}. \quad (19)$$

When $CRRUBD_x$ is a positive number, it means that if the task is allocated to the x th MEC server, the resource utilization balance of the MEC server will be improved. On the contrary, it will reduce the resource utilization balance of the MEC server. It tends to select the MEC server with a larger $CRRUBD$ value as the task migration destination.

When calculating the similarity between supply and demand, user costs are negligible. Therefore, on this basis, the energy charging model of reducing sources, reducing small sources, and reducing high sources is adopted. This makes users more willing to opt for lower cost services, such as relocation destinations. In order to ensure the load balancing of portable computing platforms, it is necessary to improve resource utilization and reduce user costs [16].

The dynamic price model based on resource surplus can be expressed as

$$d_{p,t} = \alpha_1 d_{p,0} + \alpha_2 f(S_{p,t}). \quad (20)$$

In the formula, p represents the ID of the mobile edge computing server, t represents the current time, and α_1 is the weight factor. $\sum \alpha_x = 1$, $d_{p,t} = p(b_{p,t}, e_{p,t}, f_{p,t})$, $b_{p,t}$, $e_{p,t}$, $f_{p,t}$ are the processor resource, memory resource, and bandwidth resource of the edge computing server at the moment, and $d_{p,0}$ is the benchmark resource price. It is a fixed value, and $f(S_{p,t})$ is a function of the remaining amount of resources.

$$Q_{p,t} = \delta^* \text{similarity}(p) + \frac{\varepsilon}{D_{p,t}}, \quad (21)$$

where $Q_{p,t}$ represents the migration weight of the p th mobile edge computing server at time t , $\text{similarity}(p)$ represents the supply and demand similarity between the task and the first mobile edge server, $D(p, t)$ is the price of the p th mobile edge computing server at time t , and δ^*, ε is a constant.

When the list of migration rates is obtained, they are sorted according to the rules from large to small. Finally, the mobile migration server with the highest migration density was selected by the end of the business trip. Jobs are relocated and the final results returned to the mobile terminal.

3.3. Artificial Intelligence. Artificial intelligence, referred to as AI, is a branch of computer technology. He tried to understand the meaning of understanding and developed a new type of understanding—that could respond in the same way to human understanding [17]. It is a new science that started in the 1950s. It is not only a research technology, but also a technology tool related to products for the devel-

opment of intelligent products. The concept of artificial intelligence can be divided into two categories: “artificial” and “intelligent”. Artificial intelligence is the best; that is, artificial intelligence is the kind of high-tech technology created in the human field. Artificial intelligence technology mimics humans to some degree. Thus, the study of artificial intelligence is sometimes the study of humans. Artificial intelligence is based on human understanding and uses technological methods to teach sciences and methods that can automate human activities.

In fact, artificial intelligence has been widely used in many fields and achieved fruitful results. Together with genetic engineering and nanoscience, it is known as the three leading technologies of the twenty-first century. Research in the field of artificial intelligence includes robotics, language recognition, image recognition, natural language processing, and expert systems. Since the emergence of artificial intelligence technology, its related theoretical and technical achievements have become more and more abundant, and its application has become more and more extensive. We believe that in the future, it will become an important part of human intelligence. Its increasingly important role in human society means increasing challenges.

The main purpose of today’s artificial intelligence research is to simulate human intelligence in certain scenarios, so that machines can replace human work in certain fields. When implementing deep learning, neural networks analyze data into a simulated role of the human brain [18]. At present, the development of large-scale neural network technology is the first to mature, laying the foundation for the development of artificial intelligence. As long as the two obstacles, algorithm and data, are overcome, the realization of artificial intelligence will be completed soon. Ultimately, artificial intelligence can gain experience and laws through the analysis of cases and data, without relying on human preestablished equipment and rules to achieve independent thinking.

3.4. Digital Twin. The digital twin, also known as digital mapping, has been further developed on the basis of MBD. MBD (model-based definition) is the model-based engineering definition. It is a method body that fully expresses product definition information with an integrated three-dimensional solid model. It specifies the labeling rules of product dimensions and tolerances and the expression method of process information in the 3D solid model. Enterprises generate a large number of physical and mathematical models during the implementation of model-based systems engineering (MBSE). It lays the foundation for the development of digital twins [19]. Digital twins leverage physical models, sensors, and operational history data. It is an integrated multidisciplinary, multiscale simulation process. Digital twin is a general theoretical technology system. It can be used in many fields such as product design, product manufacturing, medical analysis, and engineering construction. At present, the field of intelligent manufacturing has the most in-depth application, the highest attention, and the hottest research in the field of engineering construction.

TABLE 1: Specific content of the questionnaire.

Survey questions	Options			
How old are you?	A, 18-33	B, 34-49	C, 50-65	D, over 65
What is your occupation	A, legal worker		B, non-legal workers (add ___)	
Do you usually have access to the Internet?	A, yes (frequency ___)		B, no	
Have you ever experienced an information breach?	A, yes		B, no	
How do you think the breach will affect your life?	A, yes (add ___)		B, no	
Have you ever thought about using the law to protect your information security?	A, yes		B, no	
Do you know how many ways to protect your privacy?	A, law	B, self-protection	C, enterprise self-discipline	D, other (add___)

TABLE 2: Questionnaire reliability and validity test.

Category	Project	Result
Trust level analysis	Cronbach's α coefficient	0.752
	KMO	0.714
Validity analysis	Approximate chi-square	439.12
	df	1.874
	Sig.	0.0002
	Bartlett's sphericity test	

The digital duo can be divided into three parts: data collection, data model, and application data [20]. Digital data collection is the use of integrated satellite remote control technology, oblique antenna photogrammetry, LEAD measurement, cameras, and other technologies to achieve 3D data collection of natural field projections. Sensors are responsible for capturing a lot of real data in the physical world [21–24].

The 3D optical model is a 3D model of the physical world. The dual model of digital twins is the “sampling” of collected data and the identification of objects such as cars, roads, people, and objects. Digital twins are a new idea that covers a wide range of applications, from macros to tiny, diversity, because it incorporates semantic information from different scenarios. Depending on the car application scenarios, digital or twin city-level data can be used as high-resolution maps, that is, the personal car database. Specified model details can be extracted and parsed after interpretation, allowing for high-level applications.

4. Legal Regulation Research Experiment and Analysis of AI and Digital Twin Decision-Making Risk

4.1. Experimental Subjects. The foundation of AI and digital twin decision-making is data. Among them, the leakage of network information and data has great potential security risks, threatening users, enterprises, and national security. Therefore, it is very important to prevent the risk of data leakage. Although the pace of legal propaganda in China has never stopped, there are still many people who do not have a high understanding of the law. In order to better

investigate the user's information leakage and privacy protection awareness. We randomly selected 1000 people for questionnaire survey and collected 984 questionnaires. Among them, there are 32 invalid data, and the overall effective rate is 95.2%. At the same time, relevant legal experts and scholars were also invited to participate in interviews to investigate their views on information leakage. The questionnaire shown in Tables 1 and 2 is the reliability and validity test results of the survey data.

As can be seen from Table 2, the questionnaire is reasonable. The Cronbach's alpha reliability coefficient is greater than 0.6, indicating that the questions in the table meet the built-in consistency evaluation and meet the reliability evaluation requirements. KMO value >0.6 , spherical test sig < 0.05 , and the index data in the table meet the validity evaluation requirements.

4.2. Data Analysis. Reliability is the stability or reliability of a measurement. It refers to the degree to which repeated measurements of the same subject by the same method are consistent with previous measurements. Validity is accuracy and authenticity. It refers to the degree to which a measuring tool or means can accurately measure what needs to be measured. Reliability is the premise and foundation of validity, and validity is the purpose and destination of reliability. As can be seen from Figure 7, the population we investigated is generally concentrated in the age group of 18–49, accounting for about 80% of the total population. They are highly receptive to the Internet and frequently access the Internet. In most people surveyed, occupations are diverse. The population is divided into two categories for statistics, one is legal workers and the other is nonlegal workers. It is clear that nonlegal workers make up a high percentage, over 85%.

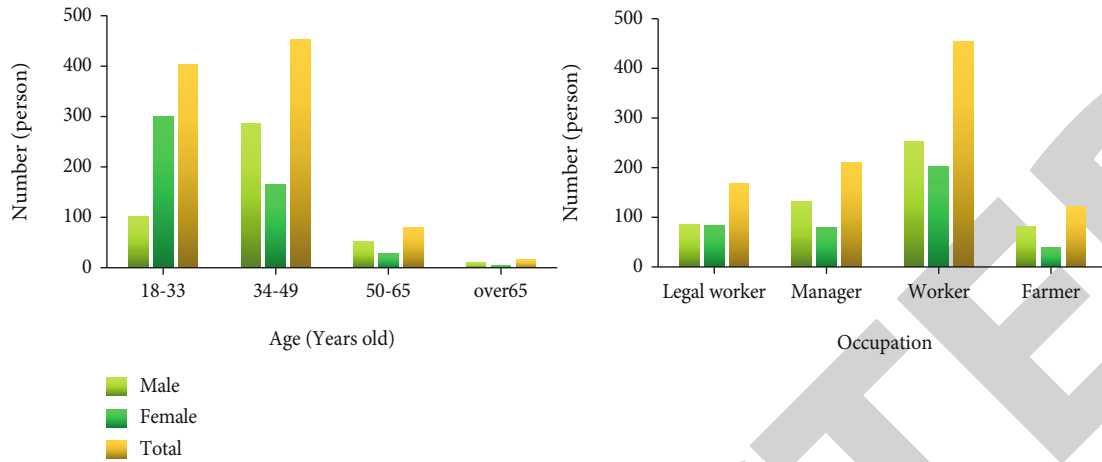


FIGURE 7: Basic information of investigators.

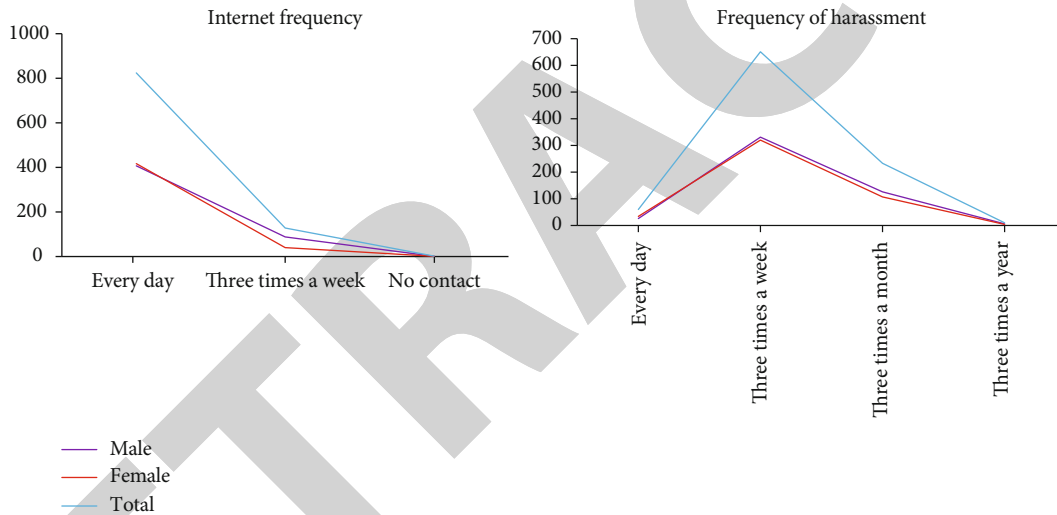


FIGURE 8: The relationship between the frequency of Internet access and the frequency of harassment.

Nonlegal workers are simply divided into three categories: managers, workers, and farmers. Among them, the proportion of employees is the highest, which is about 4 times that of other occupations. They are also the biggest victims of information leakage.

It can be seen from Figure 8 that there is a certain correlation between the online frequency of the crowd and the frequency of being harassed. It also points to the seriousness of current information leaks, with few people not receiving harassing messages or phone calls. But it can also be seen that too frequent harassment is rare. Moreover, the longer the time spent on the Internet, the deeper the degree of harassment. This suggests that the network may be a major source of information leakage and needs to be strengthened.

It can be seen from Figure 9 that information leakage will have a great impact on people's lives. Not only economic losses, but even more serious psychological damage, will bring great damage to the family relationship of the victim.

Among them, about 90% of users have suffered economic losses, about 45% of users have suffered psychological damage, and even more than 30% are used for family disputes. The reason is that about 57% of users lack user security awareness and do not pay attention to protecting their privacy. In addition, 32% of users lack legal-related systems, and 26% of the reasons are that information contains great value.

As can be seen from Figure 10, users are more powerless to information leakage. In addition to improving their own awareness of security protection, they can only expect the law to be more perfect. Enforcement is stronger, which is the direction the government is striving for. For experts, they place more emphasis on corporate responsibility. It expects companies to strengthen their own norms to avoid leakage of user information. At the same time, industry organizations should also take responsibility, set an example, and control the security of user information. In the future, it is

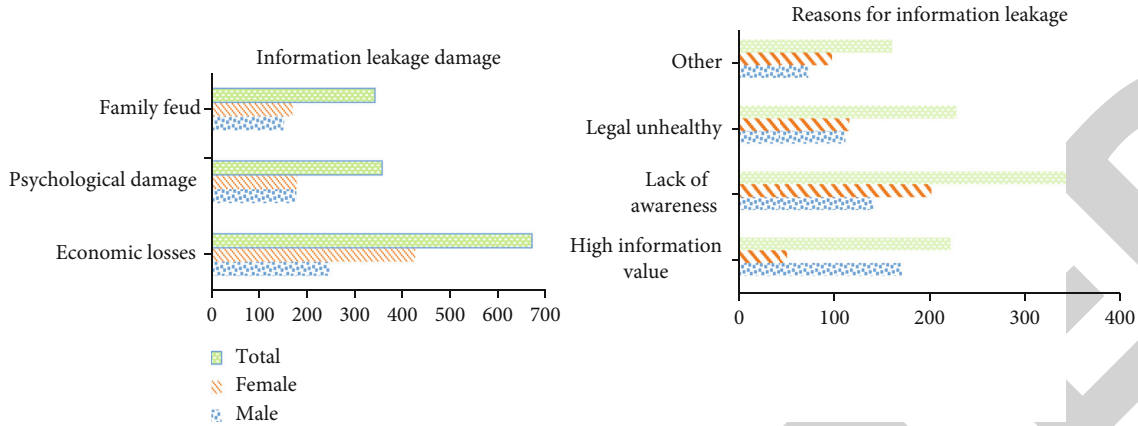


FIGURE 9: The impact of information leakage on people and the cause analysis.

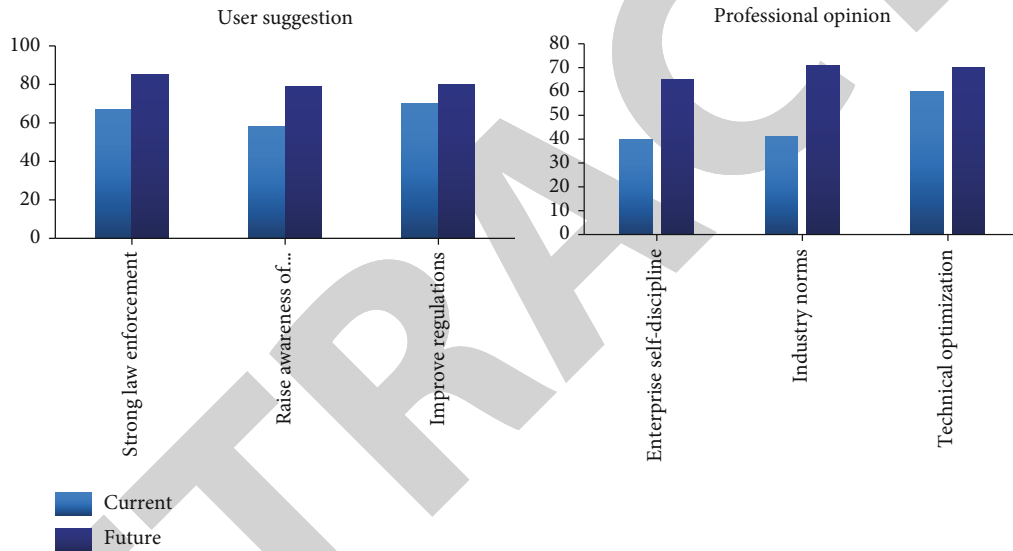


FIGURE 10: Suggestions by users and experts to reduce information leakage incidents.

expected that the technology will be further optimized and improved to make the firewall for user information security stronger.

5. Discussion

This article investigates the situation of people’s privacy leakage in the Internet age. Obviously, the current privacy breach situation is serious. There are reasons why individuals lack privacy protection, and there are also companies that deliberately divulge user privacy for their own benefit. Of course, there are also reasons why laws and regulations are not perfect and law enforcement is not in place. Privacy security is not only related to individual users, but also threatens social and even national security. Privacy leakage not only does not cause damage to the user’s property, but also even mental damage. To this end, it is imperative to strengthen privacy protection.

6. Conclusions

This paper is based on the research on the legal regulation of artificial intelligence and digital twin decision-making risks in mobile edge computing. The theoretical knowledge of mobile edge computing is introduced in detail. It also conducts experiments on information security and privacy leakage in artificial intelligence and digital twin risk decision-making. The experiment investigates the current information security status and possible reasons. This provides a feasible solution for the improvement of legal regulations related to privacy information and has certain guiding significance. But the article also has shortcomings. The leakage of private information is only a small part of the legal regulation of decision-making risk and may not represent the legal regulation of decision-making risk. Amendments to laws and regulations involve disputes over interests among multiple subjects, and there is still a long way to go to formulate detailed laws and regulations. In

addition, the construction of relevant law enforcement teams is not a one-day achievement, and the implementation of law enforcement also requires long-term efforts.

Data Availability

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Conflicts of Interest

The author states that this article has no conflict of interest.

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