Hindawi
Mathematical Problems in Engineering
Volume 2023, Article ID 9862146, 1 page
https://doi.org/10.1155/2023/9862146

Retraction

Retracted: From the Perspective of Jurisprudence View the Application of Urban Image Monitoring Technology and the Application and Improvement of the Information Collection System in This Field

Mathematical Problems in Engineering

Received 18 July 2023; Accepted 18 July 2023; Published 19 July 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

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.

References

[1] Z. An and Z. Jiang, "From the Perspective of Jurisprudence View the Application of Urban Image Monitoring Technology and the Application and Improvement of the Information Collection System in This Field," *Mathematical Problems in Engineering*, vol. 2021, Article ID 5582906, 15 pages, 2021.

Hindawi
Mathematical Problems in Engineering
Volume 2021, Article ID 5582906, 15 pages
https://doi.org/10.1155/2021/5582906

Research Article

From the Perspective of Jurisprudence View the Application of Urban Image Monitoring Technology and the Application and Improvement of the Information Collection System in This Field

Zheming An [1] and Zhiyong Jiang [2]

[1] *Law School, Zhejiang University, Hangzhou 310000, Zhejiang, China*
[2] *Practical Teaching Department, Guilin University of Aerospace Technology, Guilin 541004, Guangxi, China*

Correspondence should be addressed to Zheming An; 11502001@zju.edu.cn

Received 6 January 2021; Revised 2 February 2021; Accepted 12 March 2021; Published 8 April 2021

Academic Editor: Sang-Bing Tsai

As times go by, social management faces new challenges. This article examines the application of urban image surveillance technology and the methods of information collection and processing from a legal perspective, and explains the necessity of creating image surveillance. This article introduces the application of the system to the construction of legal systems in countries where urban image surveillance has been applied earlier and with more advanced legal systems at home and abroad, from the construction of the image surveillance legal system, the protection of personal privacy rights, and the protection of communication data. Explain the legislative principles to be followed in the legislative process, and put forward the principles of human rights and freedom, the principle of public interest, the principle of rule of law, and the principle of information security. Finally, I put forward a point of view on how to formulate a legal and fair legal system. It is clear that in the field of legislation, it is necessary to seek constitutional support, use civil law to regulate, use personal information protection law to regulate, and use urban image monitoring system legislation to manage. This paper proposes a "peer-to-peer tree" architecture of a two-tier distributed indexing service system based on service types. Its joining and leaving algorithms create and maintain the framework, cascading organizations related to service interests into a tree structure. Learning the neighbor search algorithm can slowly evolve the peer layer composed of many cascaded trees into an overlay network with small-world characteristics, thereby ensuring a higher search efficiency. Research shows that through functional testing and performance testing, it is found that when the number of supernodes is 200, the success rate is the highest.

1. Introduction

In recent years, in response to new problems created by the information society, our country's State Council has put on the agenda to speed up national legislation on information. Certain laws on the protection of citizens' privacy have been adopted accordingly [1]. Similarly, some local laws and regulations in our country have also initiated attempts to regulate the use of security systems such as image surveillance. For example, Beijing, Guangzhou, Shenzhen, and Chongqing have already issued or are drafting public security video system construction management [2].

In recent years, large cities in China have generally promoted the construction of urban image monitoring systems and more and more students have been researching them [3]. For example, Schwartz used histograms to match pedestrians on the camera network. This method is suitable for video overlay information [4]. Hariyanto et al. further strengthened the method of histogram comparison. They applied the K-means clustering method to reduce the influence of histogram information on the light intensity, making this method resistant to external objective conditions strength enhancement [5, 6]. Through the design and research of the safe city high-definition image monitoring integrated management platform, transmission network, and high-definition image monitoring product technology, Hermas focuses on the design of high-definition image monitoring for urban public safety with the background of the smart city security video resource sharing system in Jing'an District System [7].

In the research of domestic scholars in urban image monitoring technology, Jiao et al. analyzed the classic sequence image moving target detection method for the image enhancement problem of the region of interest in the monitoring image, combined it with the image enhancement algorithm [8], and proposed a technique based on the image enhancement method, and only the suspicious target area in the image is enhanced, which reduces the amount of calculation of the enhancement algorithm, while ensuring the enhancement effect of the suspicious target [9]. Aiming at the problem of low-contrast color image enhancement, Zhai et al. introduced the basic principles of the Retinex image enhancement algorithm and the classification of existing methods, focusing on the application fields and shortcomings of the multiscale Retinex image enhancement algorithm, and proposed on this basis. An adaptive scale MSR enhancement algorithm, which performs enhancement processing in the HSI space of the image, uses the variance value of the brightness component to adaptively determine the filter size, which can reduce the amount of calculation, highlight image details, and maintain image color stability [10, 11]. Zhou and Qiu proposed the equalization of partially overlapping histograms, expanding the number of effective pixels for each partial histogram equalization operation from one to multiple, thereby reducing the number of local operations while maintaining a strong restored image local information capability, but for the pursuit of fast calculations, this algorithm is prone to blocky effects. In order to eliminate the blocking effect, the image needs to be interpolated, which affects the efficiency of the algorithm [12].

In the field of legislation, this article should seek constitutional support, clearly defined by civil law, use a law to protect personal information for regulation, and use the law of the civil image monitoring system for management. For the management specifications, specify the issue of the installation and the scope of the installation, manage the monitoring system, and standardise the information used to improve the system [13] and create a mutually independent and limited system work, improving the professionalisation of managers and creating an effective internal supervisory mechanism.

2. From the Perspective of Jurisprudence, Research on the Application of Urban Image Surveillance Technology

2.1. Functions of Urban Image Monitoring System

2.1.1. Necessity

(1) *Maintain Urban Public Safety*. Under the condition of today's diverse society, there are a large number of traditional and nontraditional factors affecting public security. Terrorist attacks, civil crimes, emergency situations, and other factors affecting or likely to affect civil security are also increasing. Since the beginning of this year, many cases have occurred at national level [14, 15]. In the face of many factors affecting public safety, the traditional means of mutual assistance, community exclusion, and mass reporting have found that the control methods have been far from meeting the needs of maintaining urban safety. However, the urban image monitoring system has become an important means to detect various unsafe factors in time, deal with them in a timely and effective manner, and lock criminal suspects due to its advantages such as wide monitoring range and strong timeliness.

(2) *Promote the Construction of a Legal Society*. In the process of legalization in our country, our country has put forward higher requirements for the law enforcement of investigative agencies. The collection and verification of evidence and the formation of the evidence chain require more evidence [16]. However, due to its intuitive and personalized elements, image surveillance has become a powerful means of data collection. The establishment of a complete public security image monitoring system can actively promote the scientific and standardized investigation mechanism and can effectively promote modernization and simplify the pace of management.

(3) *Combating Illegal and Criminal Activities*. With the increasingly obvious characteristics of criminal activity, suddenness, and professionalism, it becomes more difficult to collect evidence on the spot. Due to the objective, continuous, and stable record of the monitoring system information, it not only provides strong support for combating current street crimes but also provides practical evidence and evidence for the detection of cases.

One is to provide strong technical support for combating street crimes. Electronic surveillance facilities are densely distributed in cities, scenic spots, station wharf squares, and other wealthy commercial areas where road traffic accidents occur [17], which upgrades traditional plane prevention and control to modern three-dimensional surveillance and connects with grid police. To achieve effective man-machine integration, the ability to detect and combat crimes is improved greatly [18, 19]. The second is to provide strong evidence to effectively combat crime. With the rapid development of the economy and society, the flow of people's property is increasing. The mobility, suddenness, and violence of criminal activities have become more and more obvious. Criminal methods vary, and there are fewer and fewer traces on the scene. The criminal quickly committed a crime and escaped. The time for effective disposal is limited. Since the surveillance image system can be objective, continuous, and stable, the recorded information may contain traces of criminal activities and has a unique role, which cannot be replaced by other means in investigation and case resolution services.

2.1.2. Effectiveness. The effectiveness of the urban image monitoring system has been remarkably reflected in many aspects and has been recognized by all parties.

(1) *Its Role in Fighting Crime*. According to statistics from China's Ministry of Public Security, three quarters of China's 200,000 key and critical units have installed different levels of security and technical protection facilities, using security systems and alarm service networks to crack more

than 30,000 public security and criminal cases [20]. Recovered a lot of economic losses and played an important role in maintaining social stability [21, 22].

(2) *The Role of Urban Management*. The creation of real-time monitoring points significantly improves the management and control capabilities of motorways and effectively offsets weaknesses in road traffic management, such as long lines, low police force, rapid circulation, and difficulty in gathering evidence. At the same time, by installing voice transmission and amplification devices at specific monitoring points, significant results have been achieved [23]. In addition, the image monitoring system is widely used in the law enforcement process of urban management, health, and other administrative departments. The whole process of recording law enforcement actions on the street has effectively reduced the occurrence of violent resistance to the law and provided clear facts for the handling of corresponding administrative violations.

2.2. Establishment of Urban Image Monitoring System

2.2.1. Security. The establishment of the legal system of urban image monitoring focuses on establishing a complete urban image monitoring system, so as to better protect national security and urban security through this system. The purpose of urban image monitoring construction is to ensure the safety of most people and improve social management capabilities, which is beyond doubt [24, 25]. The establishment of relevant legal systems can make the urban image monitoring system more perfect, improve its efficiency from the construction, use management and other aspects, and better play its safety protection effect. Through the application of video image monitoring technology, various insecurity factors such as terrorist attacks and violent crimes that endanger social security and urban security can be detected and eliminated in time. At the same time, the establishment of urban image monitoring system can effectively improve the sense of security of social citizens [26]. Most citizens will have a certain sense of security under the system-regulated camera probe, which also brings many benefits to improving the overall sense of security in society [25, 27].

2.2.2. Order. The urban image monitoring legal system is the embodiment of the important role of law enforcement in social public affairs. Through the establishment and improvement of the urban image monitoring system, it will effectively regulate citizens' behavioral norms in various public places and provide strong support for the establishment of the overall social order. An orderly social order is a necessary condition for social development and progress, and it is also an integral part of the needs of citizens' lives. Urban image surveillance implemented under a standardized system can effectively improve social management capabilities and help establish a standardized and orderly social order. The installation of monitoring equipment in public places may cause conflicts between the security interests of the monitor or the public interests of the society and the privacy interests of the monitored person [28, 29]. In general, video surveillance in public places and other public areas can effectively establish social order, which is beneficial to the overall progress of society and the interests of the vast majority of people.

2.2.3. Freedom. The law is to protect civil liberties. From the perspective of the overall social environment, the establishment of the urban image monitoring system can effectively maintain social order and promote social progress. In fact, it protects the entire society or the freedom of the vast majority of people in the society. It may affect some aspects of freedom of certain personnel [30, 31]. However, judging from the tradeoffs between big freedom and small freedom, anyone can come to the correct answer. Fundamentally speaking, the establishment of the urban image monitoring system is to protect the greater freedom of social citizens and more reflects the direction of human freedom.

2.2.4. Privacy Protection. The establishment of the legal system of the urban image monitoring system is also of great practical significance for protecting the privacy of citizens. As a basic personality right, the right to privacy refers to a kind of personality right that citizens enjoy the tranquility of private life and that private information is protected in accordance with the law, and it is not illegally invaded, learned, collected, used, and disclosed by others [32, 33]. The right to establish the diversity of people and the enjoyment of the right to privacy is more conducive to the development of personal self. At the same time, it also ensures the relative stability of interpersonal relationships, the safety of personal, and property, and it is important for maintaining personal peace and security. Harmony with society plays an indispensable role. Respect for personal private life is a sign of political modernization. Similarly, there are related problems. In order to defend public interests, the appropriate transfer of individual rights and freedoms is the order of social survival. This is also due to the relativity of freedom and rights. This kind of transfer itself also needs a "degree." The "degree" is the legitimacy and controllability of the exercise of power.

2.3. CGSV Indexing Service System Architecture and Related Algorithms. In order to be able to better count and predict the possibility of a certain service appearing in a certain organization within a period of time in the future, a service application type model was created based on the theory of information retrieval. This model evolved from the "topic model," one of the language models based on aggregation. It is described as follows.

The language model of a topic T has a list of words $\{w_1, w_2, \ldots, w_n\}$. When observed with unlimited data, the frequency of words used in the topic T is expressed as $\{p_1, p_2, \ldots, p_n\}$. Assuming a series of documents D about T, p_i can be evaluated as

$$p_i = \frac{f(D, w_i) + 0.01}{|D| + 0.01n}. \quad (1)$$

Here, $f(Q, w_i)$ is the number of occurrences of w_i in D, D represents the number of words contained in the document, and n is the number of words. Then, use Kullback–Leibler divergence to measure how well T's topic model predicts the request Q:

$$KL(Q, T) = \sum_{f(Q, w_i) \neq 0} \frac{f(Q, w_i)}{|Q|} \log \frac{f(Q, w_i)/|Q|}{p_i}. \quad (2)$$

At this time, $f(Q, w_i)$ is the number of times w_i appears in Q and Q represents the number of words in Q. In information theory, KL divergence is a very important information measurement parameter. In many applications, it is widely used to measure how well one probability distribution predicts another possibility. It is an area value distributed in $[0, \infty]$, and the smaller the value, the better the model for this topic T predicts the request Q.

If organization O is regarded as topic T and each word is regarded as a service, then the list of service application types corresponds to the word list in the language model, and the frequency list of words in the topic corresponds to the frequency of service application types in the organization. Document D corresponds to a series of services requested by O [33, 34]. Then, it is deduced that D is the number of services, and n represents the number of service application types. Bring these corresponding items into equation (1), and you can get equation (4). When predicting request Q, because each request has only one service, it only belongs to one service application type, so $f(Q, w_i)$ is 1, Q. It is also 1. Incorporating equation (2), you can deduce

$$KL(Q, O) = KL\left(stid_Q, O\right) = \log\left(p_Q^{-1}\right). \quad (3)$$

For specific situations, it is necessary to consider other influencing factors. It is not difficult to find that the higher the hit rate of a certain type of service, the more likely it is to exist in this organization. Therefore, the KL value is slight modified, and the mission rate (h_Q/q_Q) appears in the measurement value in inverse proportion.

2.4. Image Projection Algorithm

2.4.1. Cube Projection. Since the cube projection model is perpendicular to each other and regular polygons, in addition to facilitating the observation of the scene from all sections, it is also convenient to display the panorama. However, in order not to deform the image, it must be horizontal and in the vertical direction, and the shooting is taken at precise intervals of 90°, so it is not very practical.

2.4.2. Spherical Projection. The spherical projection model is to select a fixed point as the center of the sphere, then take two vertical lines as the axis, and shoot around it, and finally project multiple real images onto the sphere. The coordinate of pixel $p(x, y)$ in the camera coordinate system xyz is $(x - (W/2), y - (H/2), -f)$, and then its coordinate in the world coordinate system XYZ is (u, v, w):

$$\begin{bmatrix} u \\ v \\ w \end{bmatrix} = \begin{bmatrix} \cos\beta & 0 & \sin\beta \\ 0 & 1 & 0 \\ -\sin\beta & 1 & \cos\beta \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos a & -\sin a \\ 0 & \sin a & \cos a \end{bmatrix} \begin{bmatrix} x - \frac{W}{2} \\ y - \frac{H}{2} \\ -f \end{bmatrix}. \quad (4)$$

The linear parameter equation passing through point P is

$$\begin{cases} u' = tu, \\ v' = tv, \\ w' = tw. \end{cases} \quad (5)$$

The spherical equation can be expressed as

$$u'^2 + v'^2 + w'^2 = f^2. \quad (6)$$

Combining formulas (5) and (6) gives

$$t = \frac{f}{\sqrt{u^2 + v^2 + w^2}}. \quad (7)$$

(u', v', w') represents the three-dimensional parameter coordinates of the spherical panoramic image. In order to facilitate storage, they are converted into two-dimensional image coordinates. Choose the following method to achieve this conversion. When $w' \geq 0$, let

$$\begin{aligned} x' &= f \cdot \arccos\left(\frac{u}{\sqrt{u'^2 + v'^2}}\right), \\ y' &= f \cdot \left(\frac{\pi}{2} + \mathrm{arct}g\left(\frac{v'}{\sqrt{u'^2 + v'^2}}\right)\right). \end{aligned} \quad (8)$$

Otherwise, let y' remain unchanged, then

$$x' = f \cdot \left(2\pi - \arccos\left(\frac{u'}{\sqrt{u'^2 + v'^2}}\right)\right). \quad (9)$$

From the above formulas:

$$\Delta = \left(y - \frac{H}{2}\right)\sin a \cos\beta - \left(x - \frac{W}{2}\right)\sin\beta - f\cos a \cos\beta. \quad (10)$$

When $\Delta \geq 0$,

$$x' = f \cdot \arccos\left(\frac{(x-(W/2))\cos\beta + (y-(H/2))\sin a \sin\beta - f\cos a \sin\beta}{\sqrt{(x-(W/2))^2 + ((y-(H/2))\sin a - f\cos a)^2}}\right),$$
$$y' = f \cdot \left(\frac{\pi}{2} + \arccos\left(\frac{(y-(H/2))\cos a + f\sin a}{\sqrt{(x-(W/2))^2 + ((y-(H/2))\sin a - f\cos\beta)^2}}\right)\right). \quad (11)$$

When $\Delta < 0$,

$$x' = f \cdot \left(2\pi - \arccos\left(\frac{(x-(W/2))\cos\beta + (y-(H/2))\sin a \sin\beta - f\cos a \sin\beta}{\sqrt{(x-(W/2))^2 + ((y-(H/2))\sin a - f\cos a)^2}}\right)\right),$$
$$y' = f \cdot \left(\frac{\pi}{2}\right) + \arccos\left(\frac{(y-(H/2))\cos a + f\sin a}{\sqrt{(x-(W/2))^2 + ((y-(H/2))\sin a - f\cos a)^2}}\right). \quad (12)$$

2.4.3. Cylindrical Projection. Cylindrical projection means that the participant passes through a fixed observation point and keeps the distance between the camera and the shooting scene unchanged, and then it uses a translational shooting method to rotate 360° around the vertical line of the fixed point to collect scene images. Perform cylindrical projection transformation on the obtained image to obtain a sequence of spatial coordinates, and make the pixels have the consistency of the orientation information. The straight line equation between the origin of the camera coordinate system and the pixel point P can be expressed in the form of a parametric equation:

$$u = t\left(x - \frac{W}{2}\right), \quad (13)$$

$$v = t\left(y - \frac{H}{2}\right), \quad (14)$$

$$w = -tf, \quad (15)$$

where t is a parameter, and the equation for a cylindrical surface can be expressed as

$$u^2 + w^2 = f^2. \quad (16)$$

Combining formulas (13)–(16), we get

$$t = \frac{f}{\sqrt{(x-(W/2))^2 + f^2}}, \quad (17)$$

$$u = \frac{f(x-(W/2))}{\sqrt{(x-(W/2))^2 + f^2}}, \quad (18)$$

$$v = \frac{f(y-(H/2))}{\sqrt{(x-(W/2))^2 + f^2}}, \quad (19)$$

$$w = \frac{f^2}{\sqrt{(x-(W/2))^2 + f^2}}, \quad (20)$$

where (u, v, w) is the parameter coordinate of the projection point Q of the pixel point $p(x, y)$ on the cylinder, and a panoramic image is obtained by combining all such projection points. However, the parameter coordinates are three-dimensional, and they need to be converted into two-dimensional image coordinates to facilitate storage. Here, use the following formula to convert the three-dimensional parameter coordinates into two-dimensional image coordinates:

$$\begin{cases} x' = f \cdot \mathrm{arct}g\left(\dfrac{u}{w}\right) + f\theta, \\ y' = v + \dfrac{H}{2}, \end{cases} \quad (21)$$

where $\theta = (hfov/2) = \mathrm{arct}g(W/2f)$ and $hfov$ are the horizontal viewing angles of the camera.

Combining formulas (17)–(21), we get

$$\begin{cases} x' = f \cdot \mathrm{arct}g\dfrac{x-(W/2)}{f} + f \cdot \mathrm{arct}g\left(\dfrac{W}{2f}\right), \\ y' = \dfrac{f(y-(H/2))}{\sqrt{(x-(W/2))^2 + f^2}} + \dfrac{H}{2}. \end{cases} \quad (22)$$

Formula (22) is a projection formula for cylindrical orthographic projection of any pixel point $p(x, y)$ on the real image I to a pixel point $Q(x', y')$ on the cylindrical panoramic image. It can also be concluded from formula (22) that the projection algorithm has the property of preventing the scene from being deformed in the vertical direction. This property allows us to perform cylindrical projection transformation on each real image separately and obtain the corresponding panoramic image.

3. From the Perspective of Jurisprudence, Research on the Application of Urban Image Monitoring Technology

3.1. Feature Extraction of Target Samples. The network information mining system adopts a vector space model and uses feature terms $(T_1, T_1, \ldots, T_n)$ and their weights, and w_i represents target information. When information is matched, these feature items are used to evaluate unknown text and target samples. The selection of feature terms and their weights is called feature extraction of target samples, and the pros and cons of feature extraction algorithms will directly affect the performance of the system. The frequency distribution of terms in documents of different content is different, so feature extraction and weight evaluation can be performed according to the frequency characteristics of terms.

3.2. Parameters for Evaluating Search Performance. Three statistical parameters can be used to evaluate the search performance of the indexing system. The success rate represents the proportion of services that can be successfully found in each search, and it measures the effectiveness of the search; the hit rate represents the ratio of the service found to the total number of services in the network during each search, and it measures the completeness of the search. The degree of message distribution represents the average number of service request messages generated by each query and describes the average network load of the query.

The higher the success rate and the success rate, the lower the message rate and the better the search performance. Of course, the success rate must be high, because this is the basis for ensuring that services can be consulted. The success rate can be high and you do not have to ask a question for all the services that meet the requirements each time. The degree of coverage naturally meets the first two conditions, the smaller the better.

3.3. Performance Test. The service discovery mechanism plays a decisive role in the system performance of the SOA architecture. A good service discovery mechanism can quickly and effectively locate the required service and then expand the subsequent data request and acquisition. And with the increase of services and requests, it will not bring about problems such as unreachable services or network congestion. Therefore, it is very meaningful to test the performance of CGSV indexing service. However, performance testing requires a large number of services and a large number of requests. There is still a lack of such test conditions, so the simulation platform is used for testing first. When CGSV has more services and users, and richer historical data, the system can be tested. This article has carried out research on target tracking, registration, and reconstruction of low-resolution image sequences, and blind image restoration. This chapter will combine the conclusions of the previous chapters to perform super-resolution reconstruction of the actual video images. Its system function flowchart is shown as in Figure 1.

3.4. Verifying the Small-World Characteristics of the Peer Layer. In this paper, the peer-to-peer layer has small-world characteristics after a few queries. Because in the simulation program, the network does not require strong connections, and some pairs of nodes are not directly connected, the network average path $L(G)$ is calculated by the most robust method (harmonic average shortest path). It can be derived from

$$L(G) = \left(\frac{N}{N-1} \sum_{i,y \in V} d(i,j)^{-1} \right)^{-1}. \tag{23}$$

4. From the Perspective of Legal Theory to See the Experimental Research Analysis of the Application of Urban Image Monitoring Technology

4.1. Investigation Monitoring Equipment

4.1.1. Investigation Resident Voluntary Installation of Monitoring Equipment. Voluntary installation refers to the voluntary installation of monitoring systems by organizations and individuals other than the subject of mandatory installation in order to protect their own interests. Voluntary installation belongs to the rights and freedom of citizens, and it is a personal act and a civil act, so the administrative agency should not interfere too much. The fact that the administrative agency does not interfere too much does not mean that voluntary installation can do whatever it wants. Since voluntary installation is a civil act, it must be regulated by my country's civil law. The survey results of residents supporting the installation of monitoring equipment are shown in Table 1.

As shown in Figure 2, among the voting results that strongly require the installation of monitoring facilities, boys accounted for 62% and girls accounted for 42%. Judging from the voting results, the proportion is still very large, indicating that people are now very concerned about their own and property safety. Girls accounted for 40% of the votes for refusing to install, indicating that girls still pay more attention to their own privacy and security, and the scope of system monitoring can only be their own area, because the areas or public areas owned by others are not owned by you. There is no right to use and no right to install the "electronic eye" in the area of others, and if installed, it constitutes an infringement of the ownership of others.

4.1.2. Functional Level of Residents Installed Monitoring Equipment. You must not use your own electronic eyes to peek at other people's information and public information, and you must not use the information obtained for other purposes. Otherwise, it will constitute an infringement of the personal rights of others and bear corresponding civil liabilities. In severe cases, you will be subject to administrative or criminal penalties. The survey results are shown in Table 2. We draw a bar chart based on this result, as shown in Figure 3.

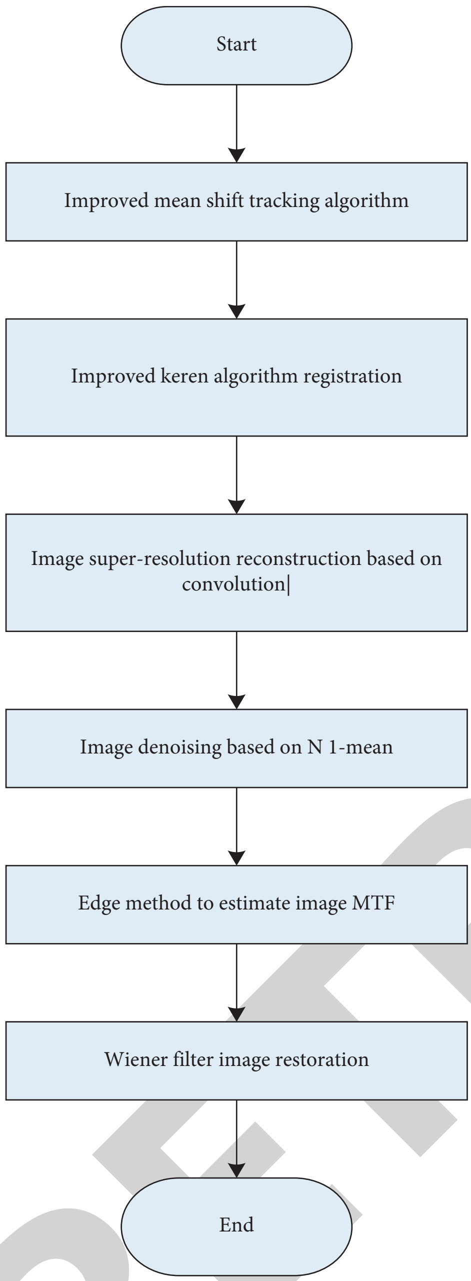

Figure 1: Program flowchart.

Table 1: The number of *n*th statistics.

Sex	Refuse	Consider	Strongly demand
Male	17	21	62
Female	40	18	42

The variance value of the local area of the image reflects the complexity of the image gray level in this area. The larger the variance value, the more obvious the image detail features. On the contrary, the smoother the image gray level is. In the calculation result of the variance value at each pixel in the image, the variance calculation area is 20% of the image size. It can be seen from Figure 3 that the distribution law of the variance value conforms to this characteristic.

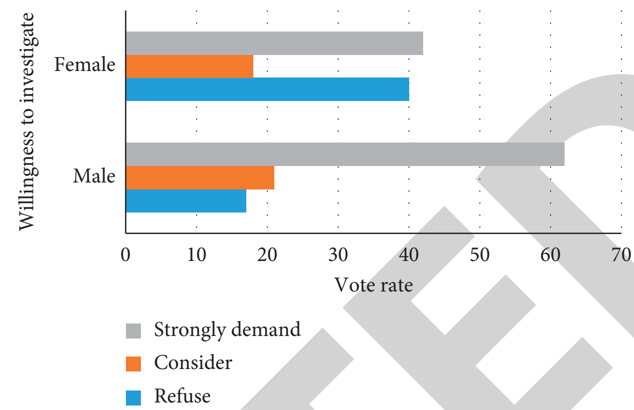

Figure 2: Average path and average clustering coefficient change of peer layer.

Table 2: Residents install monitoring equipment function grade data sheet.

Function classification	Refuse	Consider	Casual	Medium	Strongly demand
Bolt action	14.8	32.5	72.6	68.1	35.2
Dome camera	51.6	40.3	34.8	23.7	25.2
Integrated camera	19.2	28.7	69.1	66.5	33.1
Infrared day and night camera	49.3	33.6	35.6	22.8	22.9
Speed dome camera	12.7	35.6	93.2	70.2	37.2
Web camera	53.2	42.8	37.7	24.3	28.3

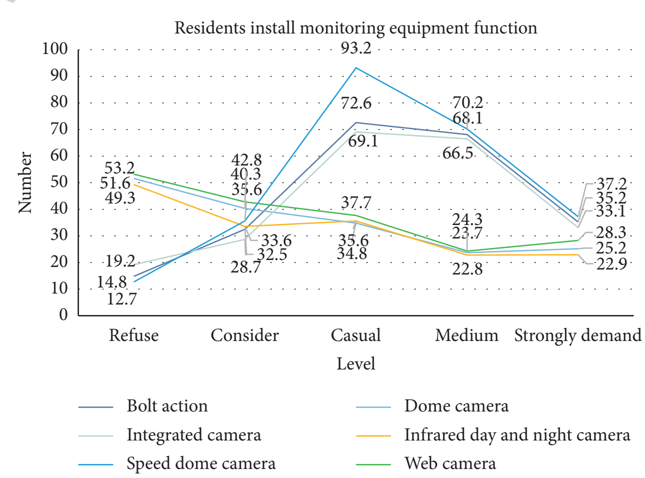

Figure 3: Residents install monitoring equipment function grade data chart.

4.2. Accurate Matching of Pedestrian Characteristics in Monitoring Facilities Helps Public Security Departments to Investigate. This article calculates and sorts the distance between a pedestrian and 98 pedestrians under another camera and records the rankings of matching pedestrians. In these rankings, the proportions of the 1–5 are calculated, respectively, and the RBG in the color comparison method is used. LAB and HSV-edgel contrast method, SIFT and SURF contrast method in the feature point contrast method, HOG contrast method, and the experimental results are shown in Table 3.

From Figure 4, we can see that the HOG method has the best effect, followed by the SIFT and SURF methods based on feature points, while the color-based RBG, LAB, HSV-edgel, and feature point methods are similar. Since the clothes generally worn by pedestrians will have some obvious boundaries on the appearance, these boundary features are stable in the same individual and have great differences among different individuals, so the HOG detection method can more accurately match the characteristics of the pedestrian, which can accurately match the proportion of pedestrians accounted for nearly 68%, and the top five accounted for 79%. The feature point method also has a higher matching rate, which helps the public security department in our country to find criminals at large, missing people, or children lost in shopping malls, which is of great significance to the stable development of society.

4.3. The Application of Peer-to-Peer Tree Search to the Monitoring System Helps Maintain Urban Public Safety. The experiment constructed 5 different peer trees. Although the total number of nodes is about the same, both are about 800, and the number of nodes distributed in the cascade layer and the peer layer is different. The number of supernodes Np is 50, 100, 200, 400, and 800, respectively. This will inevitably lead to their query efficiency. The experimental results are shown in Table 4.

It can be seen from Figure 5 that no matter the TTL is 2, 3, 4, or 5, the success rate of the monitoring system is between 85% and 97%. This shows that when the peer layer stabilizes into a small-world network, most of the requests of this system can be hit at least once in two steps. Although their success rates are very good, when the number of supernodes is 200, the success rate is the highest. This shows that due to its wide coverage, large amount of information, and strong real-time advantages, the urban image monitoring system has become an important means to detect various unstable factors in time and quickly and effectively deal with and lock suspects after occurrence.

The establishment of relevant legal systems can make the urban image monitoring system more perfect, improve the effectiveness of construction, application, and management at all levels, and better play its role in protecting public safety. Through the application of video image monitoring technology, it is helpful to timely detect and eliminate various insecure factors such as terrorist attacks and violent crimes that endanger social security and urban security. This article considers that the degree of message dissemination also increases significantly with the increase of TTL. Experiments are carried out on the degree of message distribution of peer-to-peer trees with different numbers of supernodes, and the experimental structure is shown in Table 5.

As shown in Figure 6, when the number of supernodes is 800, the peer-to-peer tree structure is transformed into a fully distributed P2P, which has a large network load and a low hit rate, which is obviously worse than the tradeoff system. When the number of supernodes is 1, the peer-to-peer tree structure becomes centralized again. Although there is no test, it can be seen from the three curves of success rate, hit rate, and message-spreading degree that the success rate will decrease. The hit rate is basically the same, and the network load has increased significantly. Therefore, when the monitoring facility faces a large crowd base, the peer-to-peer tree structure at this time is better than the fully distributed and centralized peer-to-peer structure in terms of search performance. This way, the urban image monitoring implemented under the standardized system can effectively improve the social public management ability and help establish a standardized and orderly social public order. The installation of monitoring equipment in public places may cause conflicts between the security interests of the monitor or the public interest of the society and the privacy interests of the monitored person, but in general, video surveillance in public areas such as public places can effectively establish social order. It is conducive to promoting social progress and safeguarding the interests of the broad masses of people.

4.4. Objective Evaluation Index Analysis

4.4.1. Analysis of Objective Evaluation Index of Improved Algorithm. The following objective evaluation criteria such as mean, standard deviation, and average gradient are used to test the enhancement effect of the image. For the convenience of calculation, only a certain component of the color image is used for calculation. We draw a combination diagram based on this result.

It can be seen from Table 6 that the improved algorithm can better balance the overall grayscale of the image. When the overall gray level of the image is high, the mean value of the processing result will be reduced to an appropriate gray value; when the overall gray level of the image is low, the improved algorithm can raise its average gray level to an appropriate gray value.

It can be seen from Table 7 that the improved algorithm can balance the contrast of the image. When the contrast of the image is low, the contrast can be increased after processing; when the contrast of the image is high, the contrast of the image can be reduced appropriately.

It can be seen from Table 8 that the average gradient value of the processed image is higher than that of the original image, which reflects to a certain extent that the gray distribution of the processed image is relatively uniform and the image details are more abundant.

These original color images all have the characteristics of low contrast, some partial details are not prominent, and some areas are dark. After processing by this algorithm, the

Table 3: The number of *n*th statistics.

*N*th place	Color_RBG	Color_LAB	Color_HSV_edge	SIFT	SURF	HOG
1	10	11	9	3	8	5
2	5	9	5	3	3	2
3	3	2	3	4	2	1
4	7	3	4	5	4	3

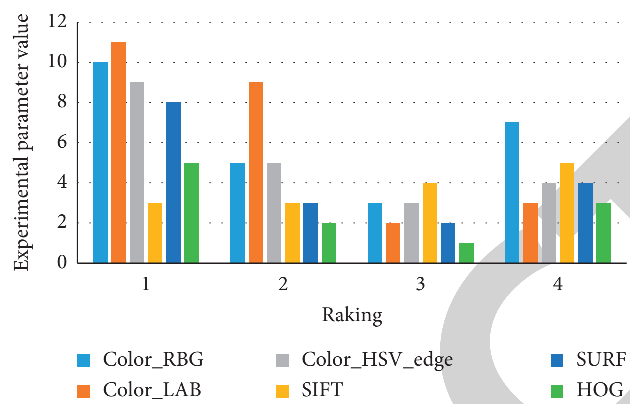

Figure 4: Comparison chart of the proportion of top *n* matches.

Table 4: The number of *n*th statistics.

Number of supernodes	150 mm	300 mm	450 mm	600 mm	750 mm	900 mm
50 supernodes	0.8147	0.09754	0.1576	0.1418	0.6557	0.7577
100 supernodes	0.9057	0.2784	0.9705	0.4217	0.0357	0.7431
200 supernodes	0.1269	0.5468	0.9571	0.9157	0.8491	0.3922
400 supernodes	0.9133	0.95750	0.4853	0.7922	0.9339	0.6554
800 supernodes	0.6323	0.9648	0.8002	0.9594	0.6787	0.1711

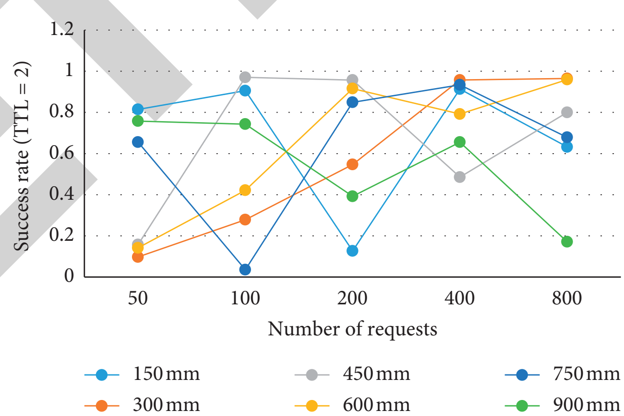

Figure 5: Changes in success rate when TTL-T and TTL-P are 2.

Table 5: Data table of the degree of message distribution.

Number of supernodes	50	100	200	400	800
TTL = 2	14.7	12.1	12.9	13.4	14.2
TTL = 3	18.6	15.4	16.7	22.3	25.1
TTL = 4	18.6	15.4	21.3	25.4	29.8

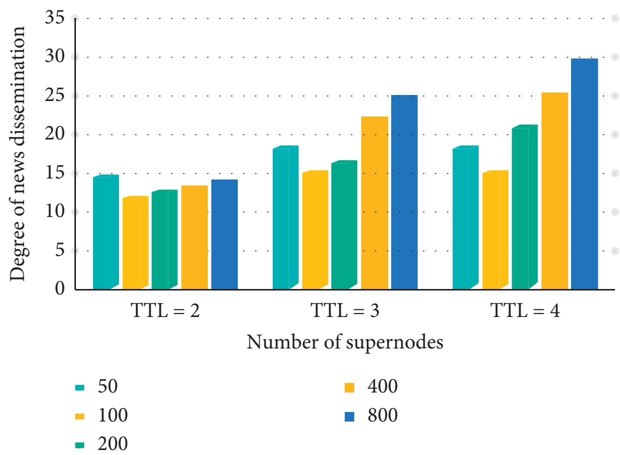

FIGURE 6: The degree of message distribution changes with the number of peer nodes.

TABLE 6: Image mean data comparison table.

	The original image	Algorithm processing result	Difference
Figure A	56.9	174.3	117.4
Figure B	19.3	87.2	67.9
Figure C	91.2	156.3	65.1
Figure D	130.9	81.6	−49.3
Figure E	72.6	43.4	−29.2
Figure F	33.6	97.8	64.2

TABLE 7: Image standard deviation data comparison table.

	The original image	Algorithm processing result	Difference
Figure A	1167.8	1732.8	565.0
Figure B	73.9	836.4	762.5
Figure C	2756.3	2337.2	−419.1
Figure D	1329.4	934.6	−394.8
Figure E	234.9	112.7	−122.2
Figure F	332.7	977.8	645.1

TABLE 8: Image average gradient data comparison table.

	The original image	Algorithm processing result	Difference
Figure A	9.4	21.7	12.3
Figure B	0.7	9.9	9.2
Figure C	11.9	19.6	7.7
Figure D	1.9	7.3	5.4
Figure E	5.6	17.2	11.6
Figure F	19.2	27.4	8.2

contrast, sharpness, and texture characteristics of the image have been significantly improved, and the overall color is more realistic. The specific situation is shown in Figure 7.

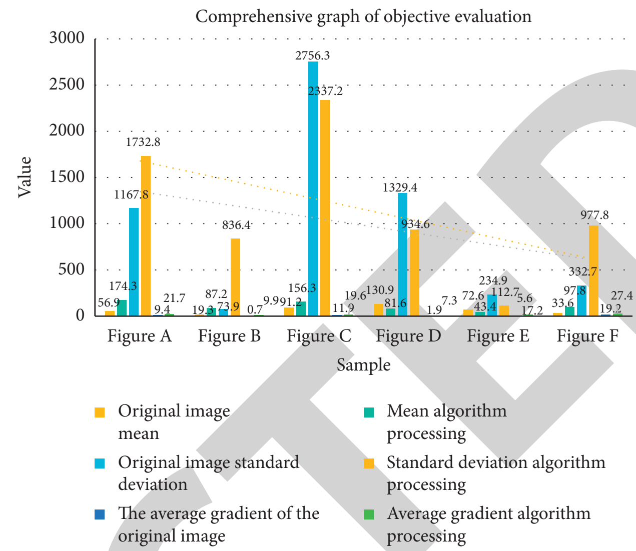

FIGURE 7: Comprehensive graph of the objective evaluation index of the algorithm.

4.4.2. Horizontal Movement Test Analysis. Quantitatively analyze the registration results before and after the improvement of the Keren algorithm, and use a low-resolution image as a reference image to calculate the displacement and rotation relationship between the image and other low-resolution images. We first need to perform a horizontal movement test on the picture and collect data for analysis, as shown in Table 9.

It can be seen from Figure 8 that the improved registration algorithm has improved the effect of horizontal movement estimation. When the moving target and the camera are relatively displaced, their size will change. Although the change is small in two adjacent images, the rigid body transformation model can be used to obtain the transformation parameters between them, but multiple pictures need to be used to perform super-resolution image reconstruction.

4.4.3. Vertical Movement Test Analysis. Quantitatively analyze the registration results before and after the improvement of the Keren algorithm, and use a low-resolution image as a reference image to calculate the displacement and rotation relationship between the image and other low-resolution images. Next, we need to test the vertical movement of the picture and collect data for analysis, as shown in Table 10.

It can be seen from Figure 9 that the improved registration algorithm has improved the effect of vertical movement estimation. Low-resolution images are obtained through degradation, especially after downsampling, and the high-frequency components of the frequency are mixed, which affects the accuracy of the registration result of the frequency domain method to a certain extent.

4.4.4. Angle Rotation Test Analysis. Quantitatively analyze the registration results before and after the improvement of the Keren algorithm, and use a low-resolution image as a

Table 9: Horizontal movement test result data table.

Serial number	Δx	Keren algorithm		Improve algorithm	
		Estimated value	Relative value	Estimated value	Relative value
1	1.37	1.3267	1.3462	1.3312	1.3763
2	2.84	2.8719	2.8552	2.8533	2.8452
3	3.42	3.4627	3.3514	3.4496	3.4219
4	3.63	3.6724	3.6433	3.6654	3.6412
5	1.75	1.7726	1.7335	1.7629	1.7489
6	1.21	1.2427	1.1936	1.2394	1.2112

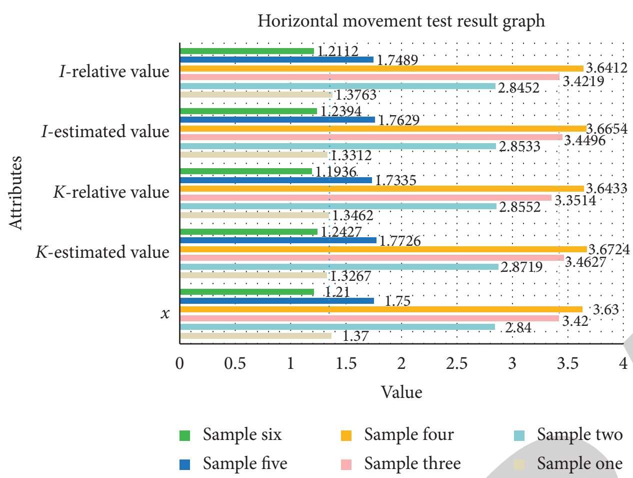

Figure 8: Horizontal movement test result graph.

Table 10: Vertical movement test result data table.

Serial number	Δy	Keren algorithm		Improve algorithm	
		Estimated value	Relative value	Estimated value	Relative value
1	2.72	2.7832	2.7567	2.7159	2.7239
2	0.64	0.5947	1.2329	0.6721	0.6488
3	3.37	3.4226	3.6213	3.2462	3.3736
4	2.25	2.2891	2.6723	2.3226	2.2496
5	1.29	1.1192	1.7724	1.2698	1.2887
6	3.32	3.2654	3.6514	3.3017	3.3229

reference image to calculate the displacement and rotation relationship between the image and other low-resolution images. Next, we need to test the angle rotation of the image and collect data for analysis, as shown in Table 11.

It can be seen from Figure 10 that when the image is rotated at a large angle, the result of the improved Keren algorithm is significantly more accurate. The flow is reflected by the change of brightness mode, and this registration algorithm is based on the brightness gradient of the spatiotemporal image to obtain the pixel displacement velocity vector, an estimation method.

4.4.5. Image Zoom Test Analysis. The Keren algorithm uses a rigid body transformation model. When there is a scaling relationship between the reference image and the target

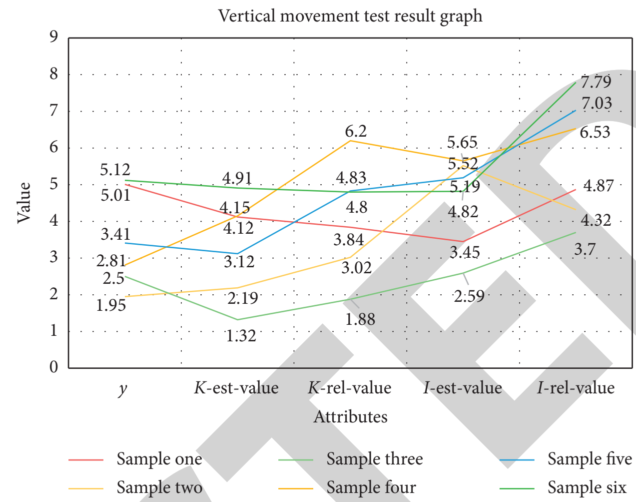

Figure 9: Vertical movement test result graph.

Table 11: Angle rotation test result data table.

Serial number	θ	Keren algorithm		Improve algorithm	
		Estimated value	Relative value	Estimated value	Relative value
1	2	1.9836	1.5656	2.0533	1.7729
2	3	2.9776	3.6827	3.0037	3.3674
3	5	4.8942	5.7923	4.9929	5.3629
4	9	8.7466	9.6528	9.0033	10.4762
5	12	11.4725	14.3727	11.9956	15.6264
6	15	14.6719	17.5436	14.9964	12.3359

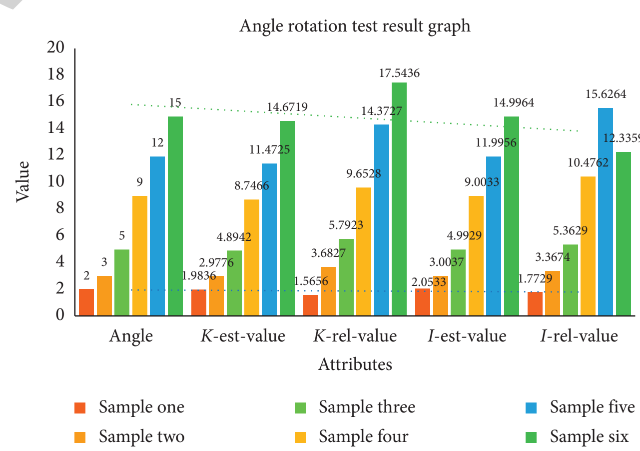

Figure 10: Angle rotation test result graph.

image, the Keren algorithm appears powerless. The model adopted by the improved Keren algorithm is very similar to the real model of the actual transformation, so the registration result obtained is more accurate, as shown in Table 12.

Due to the mismatch of this model, the parameters obtained by the Keren algorithm are very different from the real values. Therefore, the shape and scale of the neighborhood will directly affect the quality of the reconstructed image. In order to make the neighborhood change according

Table 12: Image scaling test result data table.

Registration coefficient	Actual value	Keren algorithm		Improve algorithm	
		Estimated value	Relative value	Estimated value	Relative value
Δx	2.27	8.8589	6.1739	2.4226	2.3137
Δy	1.55	6.1334	3.5527	1.7652	1.6739
θ	5	1.4127	1.4439	4.7316	4.9625
S	0.75	—	—	0.7418	0.7562

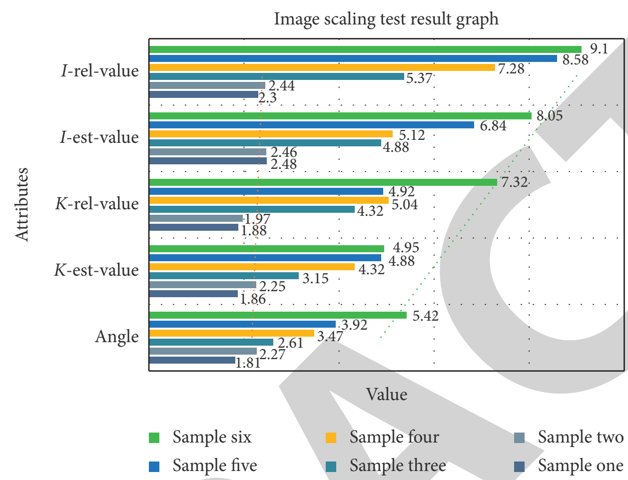

Figure 11: Image scaling test result graph.

Table 13: Matlab and Keren algorithm model processing image information comparison table.

	Original image	Matlab processing results	Keren algorithm model processing results
Mean	99.3729	119.5806	120.0127
Mean square error	31.6662	69.5349	70.1318
Information entropy	6.5421	9.1269	9.1736

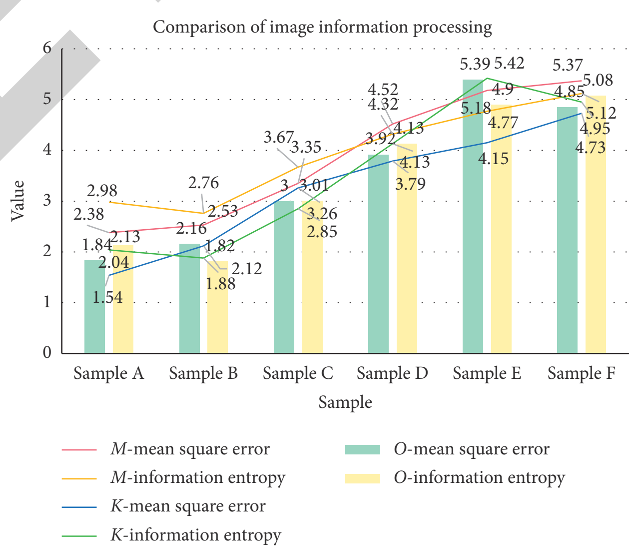

Figure 12: Comparison of image information processing between Matlab and Keren algorithm models.

Table 14: Comparison table of median filter processing results.

	Original image	Matlab processing results	Keren algorithm model processing results
Mean	50.0	49.4486	50.1832
Peak signal to noise ratio	32.0	31.1887	32.0018
Entropy	7.8	7.7965	7.8018

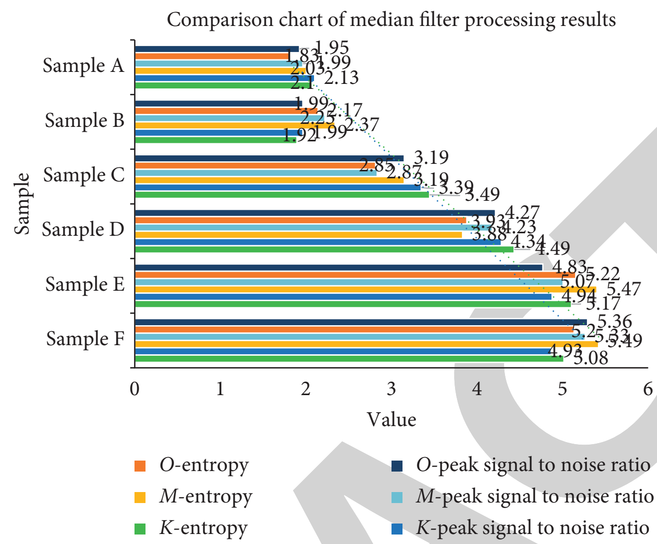

Figure 13: Comparison chart of median filter processing results.

to the organization information of the image, the normalized convolution uses an adaptive function to control it, as shown in Figure 11.

4.5. Statistical Histogram

4.5.1. Histogram Equalization Analysis. Here, we compare the processing effect of the Keren algorithm model and Matlab on the picture, read the stored value according to the data address, add one, and send the value back to the other end of the RAM for storage. The results are shown in Table 13.

It can be seen from Figure 12 that the Keren algorithm model is almost the same as the Matlab processing effect and both of which increase the image brightness. The contrast of the entire image is improved, and the visual perception of the image is clearer. It also shows that the approximate operation in the histogram mapping module in this paper has little effect on the processing effect of image data.

4.5.2. Analysis of Value Filtering in Histogram. The original image with salt and pepper noise is processed by the Keren algorithm model and Matlab, respectively. The source of image noise is mainly in the process of its acquisition and transmission, and the analog image will also bring noise during the digital quantization process. Results are shown in Table 14.

It can be seen from Figure 13 that the Keren algorithm model has also reached the processing result of Matlab and both of which effectively eliminate the salt and pepper noise in the image. The MSE and RSNR results after the two treatments are not much different, and the treatment effects are very significant.

5. Conclusions

This article strictly limits the scope of users of video image information systems through legislation and clarifies the establishment of on-duty monitoring, data management, safety management, and maintenance system requirements for the management and use of public security video surveillance systems. The location and purpose of the facility, the sale, distribution, and illegal broadcasting of video and image materials, and unauthorized changes to the use of video and image information systems stipulate the types and intensity of penalties and increase the intensity of investigation.

This paper analyzes the basic principles and basic structure of the basic theoretical information collection closely related to the distributed online information real-time monitoring and dynamic collection system and builds a structure-based distributed online information real-time monitoring and dynamic collection system, and the system. The functional framework of the software has been analyzed and studied in detail. On this basis, several key issues in the distributed online information real-time monitoring and dynamic collection system, network information mining issues, dynamic data exchange and real-time issues, and other issues that may occur in the system implementation process have been deeply studied and discussed.

In order to use the three local laws in the grid to speed up the query, this paper designs a special hybrid peer-to-peer framework "peer tree." The idea of this framework is to try to cascade the services related to the problem to be solved together, so that the services that are similar to the problem to be solved become peer neighbors, forming a two-tier structure of cascade layer and peer layer, and regarding how to ensure for the problem of search efficiency, a "learning neighbor search algorithm" is proposed based on the peer-to-peer tree. This algorithm can cluster nodes with similar interests after a few short searches to form a small-world overlay network, so that the average path between any two points is kept small.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

This work was supported by the Guilin Science Research and Technology Development Plan Project (2016012006, 20160208, 20170101–3, and 20180104–12) and Basic Ability Improvement Project for Young and Middle-Aged Teachers in Guangxi Universities (2017KY0862).

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