Research Article

Public Information Dissemination Using Data Mining-Enabled Image Enhancement and Internet of Things

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Received 13 May 2021; Revised 21 June 2021; Accepted 26 July 2021; Published 2 August 2021

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With the development of the Internet of Things, the requirement of a wide range of human-centered services may now make use of as many computing resources for media technologies and holographic images. The IoT system can monitor the status of equipment in real-time with a robust infrared image recognition algorithm. However, few researchers discuss data mining on images with valuable information. In this study, we present a generic approach that is based on the mining decision tree and holographic image improvement data analysis. We employed advanced data mining techniques to achieve image stability and use light to form a three-dimensional image with real space. The suggested model improves digital image signal transmission and noise through the grey neural network technique and, furthermore, utilization decision tree induction to create attributes-to-target label relations from image pixels. The experimental results show that the suggested approach may be highly efficient and effective for interactive image systems and image mining. Our approach may also be widely utilized and includes extremely efficient convergence systems for essential framework elements.

1. Introduction

Television and film’s overall impacts can gradually not fulfill the public need for three-dimensional visual imagery as people’s horizons get improved. The entire series of imaging technology and the creation of new digital holographic technology have become a new media arts language mixed with art from new media [1–3]. The performance of 3-D images in holographic imaging is well-known because only spatial frequencies on the surface of a sphere, the Ewald sphere, are photographed. Microsoft is now aggressively exploring technologies for holographic imaging. Holographic image technology will eliminate the leading industrial and T industries in the following years [4].

In simple terms, the interactivity of multimedia technology is to communicate with the audience and integrate traditional art categories [5]. The artistic feature of new media art itself is to enable the audience to use their senses to enjoy the artistry brought by the artworks in the state of space. However, when the artistic element of interactivity appears in new media artworks, this allows the audience to experience the inherent space and feel the uncertainty created by interactivity on the artworks [6, 7]. The audience can participate in it, the presentation of artworks has become no longer single and unidirectional, and the connotation of the exhibition can also be enriched [8, 9]. Internet giant Google is also rushing to study holographic imaging technology first. A series of full-line products have come out and are sought after by the masses. Holographic technology will attract more and more attention from the world. The audience can see the constantly changing images and graphics floating in the space, integrate holographic imaging technology into artistic creation, and use art as a foothold to recreate [10–12]. Using its realism, three-dimensional and
hypothetical vitality characteristics can bring new artistic experience to the audience and can better satisfy the audience’s inner thirst for illusion [13–15]. Image mining is still in its early stages. Most existing data mining techniques were designed for numerical data and are not well suited to image mining. Several image processing techniques such as image enhancement, image restoration, image segmentation, or compression focus on modification rather than image data analysis. As a result, while several image processing algorithms have been created, only a handful of them may apply to my image data. Metadata and image content data mining techniques may be used to index image retrieval. The main objective of image retrieval is to return similar image objects efficiently in response to a user-specified query. Until recently, the extraction of useful information and/or the processing of indexed photographs have been of little significance [16, 17]. Data extraction, marketing, government intelligence (GI), and services and advertising are widely used. Data mining is used in many sectors. Some other businesses, such as criminal agencies, retail health, e-commerce, telecom, biological data analysis, and retrievals of information, such as communication systems, are available. However, data mining is used to examine or explore the data using queries. These queries can be fired on the data warehouse. SQL Server Data Mining offers Office 2007 data mining additives for the detection of data patterns and relationships. This is also helpful in improving the analysis. The add-in called Data Mining Client for Excel is used first to plan, compile, analyze, handle, and forecast data. There are several data mining tools that companies can use to translate raw data into actionable insights. It includes statistics, artificial intelligence, hidden Markov models, meta-learning, genetic algorithm, machine learning, and decision tree.

Given the drawbacks of existing multiscenario digital image interaction, we propose a multiscenario digital image interaction architecture based on 5G and wireless networks in this paper. We propose a transfer function analysis to differentiate between two strategies, namely, rotation of the object and rotation of the light. The grey neural network technique is used in holographic tomography to improve digital picture signal transmission and noise. The experimental findings suggest that the image interaction configuration system is more efficient and effective than existing systems. Managing a decision tree is a significant benefit since it allows us to alter the categorization process and even train our model interactively. Overfitting, a better categorization issue, may be addressed more readily with these features.

The remaining paper is arranged accordingly. Section 2 outlines the proposed model design overview of related technologies. Section 3 describes digital image signal processing based on grey neural network. Section 4 provides a detailed explanation of experimental results and discussion. Finally, section 5 finishes the study with summary and future research guidance.

2. Overview of Related Technologies

2.1. Digital Image. Digital imaging is essentially an image taken with digital equipment. It is performed in a physical way, which is entirely different from traditional chemical methods, obtained by digital means and written into the memory in the form of digital signal encoding. If necessary, copy or repeat the image of the displayed object [18, 19]. Narrowly defined digital images are divided into static digital images and dynamic digital images: static digital images are generally index code photography, a digital photo in pixels, and include some digital paintings [20]. Holographic images began to become the language of new media art, combined with new media art. Currently, Microsoft is actively researching holographic imaging technology. In the next few years, holographic imaging technology will become the killer of major industrial and T industries. The digital image sensing network structure diagram is shown in Figure 1.

With the development of technology, new media art exhibits are constantly changing, and our aesthetic way of thinking is also constantly changing, which has changed our sense of originality. Holographic images are important to the creative trend of the artist and aesthetic awareness of the public in new media creation. The horizons of the public have also increased so that art might originate from the conventional media coat. Use new media art and dedicate a worldwide visual celebration [21, 22]. The audience can see the constantly changing images and graphics floating in the space, integrate holographic imaging technology into artistic creation, and use art as a foothold to recreate. Using its realism, three-dimensional and hypothetical vitality characteristics can bring new artistic experience to the audience and can better satisfy the audience’s inner thirst for illusion. Dynamic digital images are also continuous dynamic images captured by digital cameras or video recorders. However, in essence, the author believes that the so-called dynamic image is a dynamic image formed by continuous playback of static images of 24, 25, or 30 frames per second [23–34]. Therefore, a dynamic picture is a permanent static image, played in a specific frequency, strictly speaking. This article relates to the most often used digital picture category in mobile self-media [25, 26].

2.2. Internet of Things and 5G Technology. Wireless sensor network has been a hot research field in recent years because of its characteristics of interdisciplinary, high integration, and integration of multiple cutting-edge technologies [27, 28]. At present, it has received extensive attention from researchers at home and abroad. This paper adopts the 5G access network system architecture based on NFV technology proposed in the literature. The whole architecture is divided into 3 layers: user layer, virtual operator layer, and infrastructure provider layer [29, 30]. It is more effective to use a combination of static and mobile sensors in the
scanning coverage, which mainly monitors the area through static nodes and records them locally and later retrieves them by mobile nodes. The main goal of the scan coverage problem is to ensure that the scan covers a given monitoring area while minimizing the number of mobile sensor nodes used. The improved wireless sensing and 5G combination structure diagram are shown in Figure 2.

Among them, the user makes a business request. Virtual operators provide services to users to deploy SFCs corresponding to user services [31, 32]. The infrastructure provider virtualizes management through network functions [33–35]. The VNF in the SFC needs to occupy the CPU resources and memory resources in the P1. Because of its low price, convenient operation, and certain perceptual communication capabilities [36, 37], the sensor can provide intrusion detection and border inspection functions. The control of the orchestrator realizes the orchestration and deployment of different VNFs according to the SFC deployment request to form different virtualized indoor baseband processing units and access to appropriate virtualized remote radio frequency units to meet different user service requests [38, 39]. On the other hand, compared with traditional networks, WSN has several resource constraints, including but not limited to limited node energy, limited communication range, low bandwidth, and limited computing power of nodes [40–42].

### 3. Digital Image Signal Processing Based on Grey Neural Network

This section mainly introduces digital image signal processing based on a grey neural network. Grey neural network algorithm is easy to implement, is fast in communication, and has a strong global search power, so it is applied in many disciplines. The neural network field has been widely used, so some scholars also combine the grey neural network algorithm with the wireless sensor network, but because the grey neural network algorithm requires relatively high computing power of the device [43, 44], the basic steps of the grey neural network algorithm training process can be described as follows: it is more effective to use a combination of static and mobile sensors in the scanning coverage. It mainly monitors the area through static nodes and records them locally and later retrieves them by mobile nodes. The main goal of the scan coverage problem is to ensure that the scan covers a given monitoring area while minimizing the number of mobile sensor nodes used.

Input samples and use the predetermined activation function to calculate the actual output value of each node [45–48]:

\[
o = f(w x).
\]

The neuron activation function requires derivation everywhere, and a commonly used activation function is a function:

\[
f_1(x) = \frac{1}{1 + e^{-\lambda x}}.
\]

Use the following error function formula to calculate the mean square error of network performance:

\[
E(w) = \frac{1}{2} \sum_{k \text{outputs}} (t_k - o_k)^2,
\]

\[
I(\theta) = \prod_{i=1}^{n} (h_\theta(x))^y_i - [1 - h_\theta(x)]^{1-y_i}.
\]

Among them is the expected output value of the sample and is the actual output value of the node in the output layer. In recent years, introducing a small number of mobile nodes into traditional WSNs to solve coverage holes has become a major research focus. The multiscene digital interactive mobile coverage optimization method is shown in Figure 3.

![Digital Image Signal Processing Structure Diagram](image.png)

**Figure 1:** Digital image sensor network structure diagram, adaptive from [20].
Therefore, when the coverage method studied in a two-dimensional plane is applied in the real three-dimensional physical world, it seems have full of loopholes. However, with the continuous expansion of the application range of WSNs, more and more researchers have launched research on three-dimensional coverage control methods. Therefore, this chapter will mainly study static coverage in mobile coverage. The main goal is to repair coverage holes while also considering maximizing network coverage and the balanced distribution of nodes.

Calculate the error term of each output node in the output layer:

\[
\delta_k = o_k'(t_k - o_k) = o_k(1 - o_k)(t_k - o_k). \tag{4}
\]

Calculate the error term of each hidden node in the hidden layer:

\[
\delta_k = o_k'(t_k - o_k) = o_k(1 - o_k) \sum_{k \in \text{outputs}} w_{kh} \delta_h, \tag{5}
\]

where \( \delta_h \) is the error term of each hidden node in the hidden layer.

\[
h_\theta(x) = \left[1 + \exp\left(-\theta^T x\right)\right]^{-1}. \tag{6}
\]

Calculate the correction value of each connection weight. The smaller one can ensure more stable convergence of training, and the larger one can improve the convergence speed to some extent.

\[
\Delta w_{ji} = \eta \delta_j x_{ji}, \quad w_{ji} = w_{ji} + \Delta w_{ji}, \tag{6a}
\]

Continue to loop until the error becomes small enough or the number of cycles reaches the upper limit. Then, the audience can see the constantly changing images and graphics floating in the space, integrate holographic imaging technology into artistic creation, and use art as a foothold to recreate. Using its realism, three-dimensional and hypothetical vitality characteristics can bring new artistic experience to the audience and can better satisfy the audience’s inner thirst for illusion. Dynamic digital images are also continuous dynamic images captured by digital cameras or video recorders. The multiscene digital interactive hybrid sensor network is shown in Figure 4.

After the hybrid sensor network is randomly deployed, the unit cube is divided, the coverage weight of the monitoring area falling into the unit cube is calculated, and the coverage hole analysis is performed by combining the coverage weight of the three-dimensional surface in the unit cube and the three-dimensional joint detection probability at the feature point, and the base station analyzes the feature point. The integrated positioning and communication with the mobile sensor nodes enable the mobile nodes to repair the coverage holes. The algorithm in this paper finds the mobile node combination with the shortest average moving
distance through the location of specific location information by the base station.

4. Experimental Results and Discussion

In this section, we perform the interactive imaging that has made its interactive mode clear. We deeply perform interactive video installations in the form of a carrier that exists like other kinds of creative expression. At the same time, technology affects interactive imaging equipment, and the technology is frequently challenging to resolve. It turns out that the work’s connotation is unfathomable and that mere touch has no meaning. Although technological advancements have resulted in interactive video installations, art does not employ technology. Video installations that do not have artistic connotations tend to be or tend to play with marketing displays and public design.

4.1. Performance Analysis of Multiscene Digital Imaging.

For the multiscene digital image interaction research, we used a variety of test activities. Simultaneously, technology has a significant impact on interactive imaging devices, and the technology is sometimes difficult to resolve. We previously put them before finishing the work, expecting to launch a work by technological methods. Multiscene digital imaging technology will be tested and simulated in terms of reaction speed and server durability. We arrived at the following set of test findings after completing a series of tests and analyses. The multiscene digital imaging technique is depicted in Figure 5.

We previously put the multiscene to finish the work, expecting to launch a work by technological methods. In the scanning coverage, it is more beneficial to utilize a mixture of static and mobile sensors, which primarily scan the area through static nodes, record them locally, and then retrieve them via mobile nodes. The scan coverage problem’s major purpose is to ensure that the scan covers a particular monitoring region while using the fewest mobile sensor nodes possible. Some collections of interest points only need to be checked regularly in particular applications, and scan coverage is provided for such applications. Scanning coverage does not always cover the entire region. However, it gathers data about the monitored region via mobile nodes in the mobile network and sends it to a central processing unit like a BS. Artists create by thinking about art, and interactive technology is right around the corner. Simultaneously, technology has a significant impact on interactive imaging devices, and the technological bottleneck is sometimes difficult to resolve.

4.2. Comparison of Grey Neural Network and Other Algorithms.

The primary objective of the scan coverage issue is to make sure the scan covers a certain region and minimizes the number of mobile sensor nodes utilized. We came to the next test findings after a series of tests and analyses. Figure 6 shows the quality compared with a compression rate of 50%. We will further compare and evaluate the model to evaluate the superiority of digital image interaction technology produced in this paper. The grey neural network approach is comparable to and analyzed in other approaches. We will evaluate and simulate multiscene digital imaging technology’s responsive speed performance and server durability. A mix of static and mobile sensors in the scanning coverage may be used more efficiently, especially by monitoring the region by static nodes and recording them locally and afterward by mobile nodes.

The experimental findings reveal the efficient interaction image system built, the overall verified analysis is shown in Figure 6. This article is reasonably free to be created by an artist. However, as a new media artist, he has to have computer abilities, necessary reservoirs of information, and communicate with other multidisciplinary employees and associated technicians. Any compelling design example of a new media art shows ought to be a consequence of interdisciplinary and different teams working together at the present large-scale cultural and art show. He is more like a manager and organizer, now being an artist in the whole new media art project team. The artist must not only properly control the subject of the work but also coordinate the cooperation between different subject areas. Cooperation between diverse topic areas has to be coordinated.
4.3. Data Mining Image Enhancement. The results may also be used to process new photographs from the same area. In the proposed model, we produced via a mining decision tree classifier. After such a database-like table is created, mining techniques may match the required input images dataset. For this reason, in our survey, we have used the decision tree. The decision tree has the benefit that competing systems, such as neural networks, provide clear English rules or logical statements. For example, if a grey pixel runs between 180 and 240 and entropy exceeds 0.5, the pixel or POI is of concern.

(1) Suppose a pixel’s grey level is less than 180 and its regional difference is shorter than 0.4. In that case, it is an external framework pixel.

(2) Suppose a pixel’s grey level is greater than 100 and its regional difference is shorter than 0.4. In that case, it is not an external framework pixel.

(3) If a pixel’s grey level is more than or equal to 180, it is not an external framework pixel.

The key assumption of our method is simplicity and understanding. The outcomes of such a process for extraction can help us better understand the image quality and the world. If readable, a results classification can immediately be transformed into a set of human rules. With the built-up classifier, you can additionally pick key characteristics. Functions have a bigger influence on the pixel class for division criteria at higher tree levels. The selected characteristics may reflect the visual attributes of the label and assist in designing or strengthen other image processing algorithms.

5. Conclusion
A unique, efficient, and effective model is developed in this research work. Data mining and image processing technologies may be combined using our methodology. First of all, this paper builds a multiscene digital image interactive architecture through unlimited sensor networks and 5G computing to provide a foundation for later signal processing. Then, we optimize the signal transmission and noise.
of the digital image through the grey neural network algorithm and, finally, the difference between the interaction accuracy for the image interaction system constructed in this paper. The proposed model’s specialization encompasses the additional formulation of raw image characteristics, the transformation of label design attributes, the integration of multiple masks, and the collaboration of current approaches. However, we achieved some research results on multiscene digital image optimization methods. However, there are still many problems worthy of study in data transmission optimization methods. Therefore, we will further explore data transmission optimization methods suitable for multiscene digital images.

Data Availability
The data used in this study are available in public channels.

Conflicts of Interest
The authors declare that they have no conflicts of interest.

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