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Research Article

Urban Llandscape Design and Maintenance Management Based on Multisource Big Data Fusion

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Data modeling based on the fusion of data from multiple sources can improve modeling accuracy compared to a single data source. A new modular information fusion model based on genetic neural networks is designed for the urban landscape design process. A digital elevation model is created using an ordered sequence of numbers based on preprocessed sensor images. A 3D orthophoto is then obtained to generate a 3D landscape using an artificial parallax-assisted mechanism. The scale and resources of the regional landscape are described by the three-dimensional geometric dimension after data processing, and a modular landscape model with a clear subject is constructed. Finally, a genetic algorithm based on real number coding optimizes the initial weights of the neural network and selects suitable learning factors to train the neural network to complete the data fusion task and error analysis. The maintenance situation is analyzed by introducing a multifactor landscape maintenance evaluation method. The simulation results show that the fusion process of the above model is stable and the energy consumption of information fusion is low, which can promote the efficient construction of the landscape and has important application value for improving the landscape design and maintenance management.

1. Introduction

In recent years, China's near-Earth space Earth observation means have become increasingly mature, especially in the field of mapping, point cloud scanning, and tilt photogrammetry techniques. These have played a role in technological innovation in constructing 3D models. However, based on the multidisciplinary integration of space-to-earth observation technology, when a single means of measurement technology is developed to a certain stage, it may encounter different degrees of technical bottlenecks. For example, airborne radar can scan complex terrain in 3D point clouds around the clock, and laser pulses can penetrate vegetation to reach the ground. Multiwave reflections are formed, point cloud data have intensity information but do not have spectral properties, and surface point cloud data have intensity information do not have spectral properties and surface features are not obvious, making it difficult to make professional interpretations in several fields such as geology [1–3]. Oblique photogrammetry is rich in spectral information, but its elevation accuracy is poor. It is not possible to collect complete terrain data in densely vegetated areas. Therefore, at this stage, it is not possible to construct a complete and fine 3D model at a large scale in replicated terrain from a single measurement. Several scholars have conducted research on the fusion processing of airborne LiDAR and orthophotos. More fruitful results have been achieved. Some researchers have conducted fusion experiments using airborne LiDAR data and orthophotos and successfully assigned the spectra of the orthophotos to the point cloud data, making up for the lack of spectral information in LiDAR point clouds [4–6]. Others have investigated the use of LiDAR data combined with aerial imagery to automatically generate building models; Secord explored the use of LiDAR data and the use of DEMs obtained from LiDAR data and their corresponding image information for feature extraction. Pili S investigated a multiscale theory for extracting buildings from LiDAR and image data [7–9]. Mutani G proposed a feature classification method for the fusion of LiDAR and aerial optical images [10, 11]. However, from aerial surveys and other projects, the fineness of the above models is still insufficient, especially in extracting urban landscape models [12–14].

At present, the process of capturing a three-dimensional realistic view of the city is generally achieved by means of a panoramic capture vehicle. Pseudo-3D panoramic images are initially realized by installing a panoramic photographic acquisition device on the vehicle platform. The image information is then used to achieve 3D realistic modeling of urban buildings with the support of tilt photography analysis software.

This modeling process requires the integration of many city information, such as place names, road names, public transportation systems, pedestrian flow, and traffic flow. The early city map system has initially achieved the integration of relevant data and, in the process of building a 3D realistic commercial service map, further integration of 3D realistic maps into the early data system to form the final service. The technology uses satellite and aerial overhead telemetry small-angle image information to fuse with the city's 3D real-world vehicle information, eliminating vehicles, people, and other interfering information, forming a fixed building with material 3D model, using the early building area identification information and road identification information to segment the 3D model and then fuse into the traditional map information. The core innovation of this technology is to make full use of the existing big data resources to realize the rapid and intelligent modeling of urban 3D realistic maps that can be used for commercial services without additional information collection. Tilt photography 3D modeling technology is high-tech, through the flight platform carrying one or more tilt photography cameras while collecting images from different angles such as vertical and tilt using professional software for aerial triangulation, geometric correction, the same name point matching, regional network joint leveling, and other processing and finally the leveling image attitude information to each image so that they are in a virtual three-dimensional space. The image pose information is finally given to each image after leveling so that they have the position and pose data in the virtual 3D space. Then by constructing an irregular triangle network, automatic texture mapping, and reconstructing the real-world 3D model, each pixel on the image corresponds to the real geographic coordinate position, and the tilted real-world 3D model has the characteristics of high precision, high resolution, and high definition. In recent years, the real-world 3D model has been widely used in various industries, including smart cities, intelligent scenic spots, digital archiving and protection of ancient cultural relics, intelligent monitoring of law enforcement, and urban landscaping landscape. However, in the actual aerial photography process, there are more blind areas, obscuring, and other condition restrictions, resulting in urban landscaping landscapes; there are also hollow, pull flower and other model quality problems. This article studies the fusion of multisource data to improve the quality of tilted urban landscaping landscape modeling problems, enrich data information, and broaden the application areas. The key technology research and analysis of low-altitude UAV tilt photography with a bird's eye view can obtain rich side textures of the target and, through the air three encryption processing, dense matching, and automatic texture mapping, can not only build high-precision tilt realistic 3D models but also generate true color point clouds [15–17]. The vehicle-mobile measurement system integrates high-precision inertial guidance, GNSS, LiDAR, panoramic camera, odometer, and other high-precision equipment and can obtain high-precision vehicle-mounted laser point cloud and panoramic image through a combined navigation solution. How to design UAV tilt aerial photography and vehicle-mounted mobile measurement scheme with equal precision is the key technology of multisource data fusion urban gardening landscape design [18–20].

The available data sources are analyzed from satellite remote sensing and small-angle overhead information from medium- and low-altitude aircraft telemetry, which is used to build virtual Earth services in the early days, i.e., forming a planar map of urban areas, and the planar city map formed by the early work of dividing buildings, roads, and greenery and water areas of the city comes from this group of information. The pseudo-3D real-view information from the city 3D real-view acquisition vehicle is used to obtain multiangle sweeping images of the city buildings by means of elevation sweeping, giving a high degree of reproduction of the multiangle building shape and visible light information. The essence of the pseudo-3D realistic view is not a 3D model but a subjective feeling similar to 3D observation for the viewer. The open map system gives user marker functions to obtain road names, public transportation routes and stops, store locations, building names, greenery and water-related AD names, and other naming information. The vehicle location and speed information collected by the vehicle map system in real time gives information about the road capacity and traffic flow. The above four data sources are combined to form the big data required for modeling. The idea of combining data using processing is shown in Figure 1.

The process of collecting and processing these data in Figure 1 can be described as follows. The initial 3D model of the 3D live map system is obtained by combining the overhead map data package obtained from satellite telemetry and aircraft aerial photography with the pseudo-3D live map data package obtained from the live view acquisition vehicle. The model can be integrated with tilt photography analysis software such as Smart3D (Overlook Technology, China) to form an initial 3D model of the urban area. This process can be carried out using the Eclate Deplace plug-in built into 3D model processing software such as SketchUp (Last Software, USA) for data fusion. The segmented city 3D model is then returned to Smart3D and incorporated into the visible light information of the pseudo-3D live map to form the material information of the 3D model, forming a 3D shaded model, as shown in Figures 2 and 3.

In order to study the feasibility of fusing mobile survey and tilt photography data, the accuracy rates of the vectorization results of multiple tilt aerial photography and tilt realistic 3D models were statistically analyzed, forming a solid technical foundation for fusion modeling research by

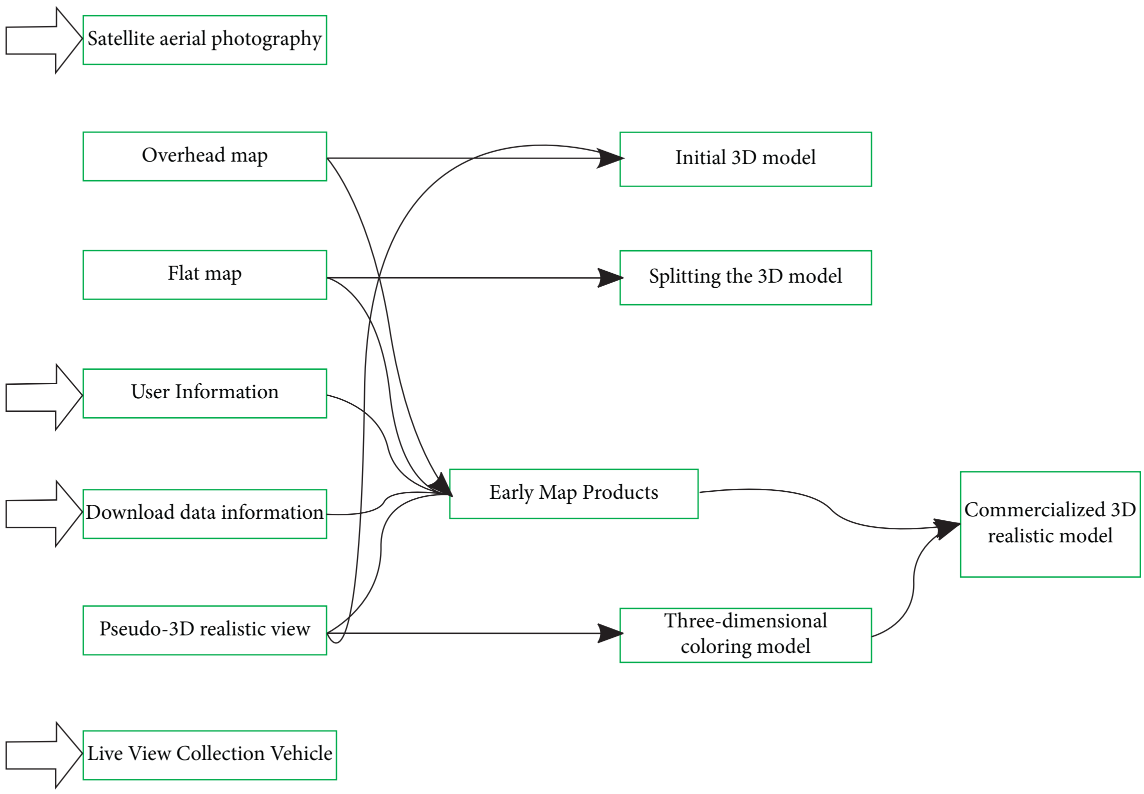

Figure 1: Results of analysis of available data sources.

Figure 2: Pegasus UAV low-altitude high-precision tilt photography.

Figure 3: 3D model.

comparing the tilt image resolution and model accuracy, as shown in Table 1.

The first requirement for the feasibility of fusing mobile measurement data with high-precision tilted real-world 3D data is equal accuracy of multisource data acquisition. To demonstrate the accuracy of data fusion, tilt aerial photography scenario planning is carried out with reference to

Table 1: Comparison table of tilt image resolution and model accuracy.

Navigation height/m	Image resolution/cm	Model accuracy/m
190	3	12
96	1.5	4.9
77	1.2	4.3

the measured accuracy of airborne mobile survey data. Then control point addition, image control stabbing point, and null triple solution are performed under the software. Then the point cloud module is used to import the airborne mobile point cloud results for data fusion. Finally, joint modeling is performed.

A comparative verification and analysis of the joint modeling error were carried out on the above basis, as shown in Figures 4 and 5.

Figure 4 shows errors in the captured base data. Figure 5 shows the comparison of the fluctuations after data fusion processing over the normal data. It is evident that the fused results are much smaller than the normal data error, and this proves the advantages of data fusion.

2. The Application Innovation of the Three-Dimensional Live Map Data Fusion Technology

Google Earth (Google Earth) launched the 3D map service of key cities in 2008 and finally stopped updating it in 2014 due

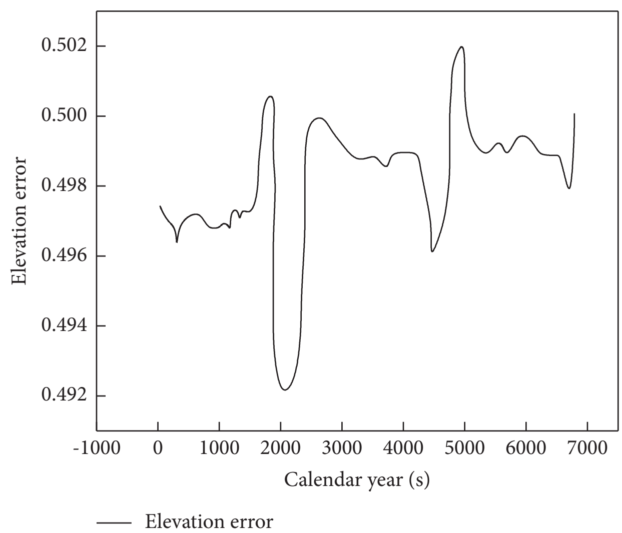

Figure 4: Test error situation.

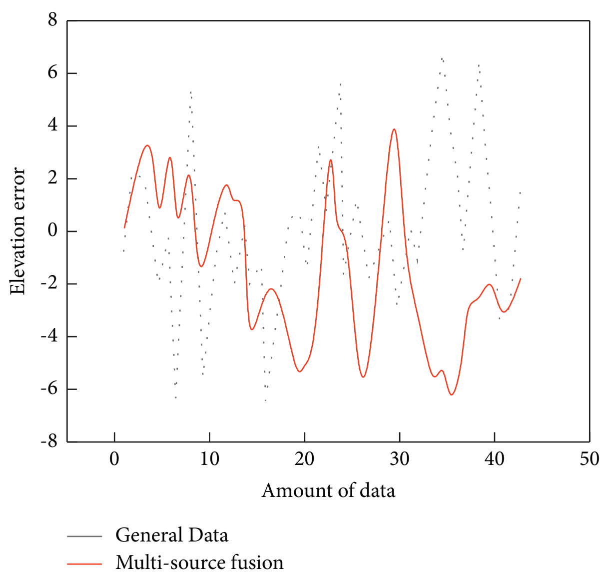

Figure 5: Error situation with and without multisource data fusion.

to the weak applicability and usability of the technology. Analysis of its real problems showed the following reasons:

(a) Its three-dimensional map mainly uses manual editing to build the model, which consumes more man-hours and has higher development costs, can only focus on the development of the city's landmark buildings, and can not achieve the three-dimensional display of all buildings in the city.

(b) Subject to artificial modeling, its building details are of low restoration degree and most of the buildings are displayed using large solid block modeling with simple skin.

(c) The complex overpass facilities and underground lane information required by users cannot be displayed in the manual modeling process, so the practicality of its 3D map is poor.

(d) The application process of 3D live maps is not fully integrated with the more marketable navigation systems. That is, its 3D real-view maps are mainly used for city horizon display rather than being organically integrated with 2D maps. This leads to its low actual market return, and the benefits are much smaller than the costs.

The core reason is that the service was launched earlier, even earlier than the launch of the pseudo-3D live map. The technical origin of the pseudo-3D real-view map launched by the major domestic map enterprises in the later period comes from the immature characteristics of the early 3D real-view map technology. Therefore, the technology is rebuilt under the current technical conditions, mainly because the current map data can already meet the demand for the construction of three-dimensional realistic maps. The data composition of the mainstream map services in the domestic market is shown in Table 2.

According to the number of distribution scatter map distribution sample points and the level of homogeneity, the conventional Kriging difference or the block Kriging interpolation method is selected, and the appropriate difference is implemented according to the sampling point spacing and the global spatial distribution pattern of sampling points. According to the range of the digital elevation model, define the external rectangular shape of the sample point data set and get the final expression form of the data elevation model; mark the generated digital elevation model and detect whether it contains a distortion phenomenon. The digital orthophoto has accurate plane orientation and has strong two-dimensional intuition. In order to develop the above advantages to 3D, the digital orthophoto with significant advantages and the garden auxiliary image based on the digital elevation model are integrated into the artificial parallax-assisted mechanism to form a three-dimensional orthophoto pair, thus generating a 3D urban landscape with intuitiveness and high accuracy. In accordance with the above process of using orthophoto pairs to generate a 3D urban landscape, the basic principle is to implement the mapping process between the 3D image in the orthophoto pair and the 3D landscape; the specific steps are as follows: according to the urban 3D landscape design needs, develop the corresponding orthophoto pairs, while generating 3D images, and use them as 3D urban landscape design comparison images. According to the comparison image of terrain undulation degree, the relative three-dimensional landscape is designed in accordance with the condition of the contrast image, such as topographic undulation, undulation change rate, slope direction, and slope, and all kinds of factors should be fully corresponding to the three-dimensional landscape building texture optimization and surface affiliated plants coloring; the three-dimensional landscape composition is properly adjusted according to the city layout. From the real problem, we specify the texture path selection space, treat individual ants as intelligences, and set each ant in the ant colony algorithm to have the following characteristics: each time it traverses the complete path in the complete graph, each ant has a residual feature

Table 2: Big data composition model of current mainstream map services.

Map service	Flat vector image	Satellite visible map	Earth contour map	Pseudo-3D map	Real 3D view
Baidu map	Yes	Yes	No	Yes	No
Tencent map	Yes	Yes	Yes	Yes	No
Sogou map	Yes	Yes	Yes	No	No

pheromone on the path it passes, and the subsequent paths selected by the ants are related to the feature pheromone. To prevent too many feature pheromones from burying the inspired information, the pheromones are updated after one full cycle of the cycle, then the amount of information in path (i, j) at time $t+n$ can be adjusted using the following equation:

$$\tau i_j(t+n) = (1-\rho)\cdot\tau_{ij}(t) + \Delta\tau_{ij}(t), \quad (1)$$

$$\Delta\tau_{ij}(t) = \sum mk = 1\Delta\tau_{kij}(t), \quad (2)$$

where ρ is the set pheromone volatility factor and m is the number of ant colonies set according to the size of the optimization problem. Usually, the higher the value of m, the better the accuracy of the best solution obtained. To ensure the authenticity of the ant colony algorithm results, an appropriate pheromone update method is set. When each ant traverses a known texture path, the pheromone concentration in each edge covered by the path is updated according to the length of the texture path, and the pheromone update process is as follows:

$$\Delta\tau_{kij} = \left(\frac{Q}{CK}\right), \text{path}\,(i,j)\,\text{is traversed by ants.} \quad (3)$$

Equation (3) is the quantitative formula of the pheromone update value, CK indicates the total length of the texture path created by k ants, and Q has a certain uncertainty and is usually set to 1. The independent variables of the solution problem are treated as genes, coded into chromosomes, and the best evaluation is taken in the set of chromosomes according to the size of individual fitness. Three types of genetic operators, selection, crossover, and mutation, are used constantly in the search to complete the generation and reproduction of new individuals and finally obtain the best individual. With a larger number of patterns, multiplicity, and proper selection of character length and population specifications, it is possible to find the range where each extreme value point is located within the initial few generations of the population. The search rate is enhanced. The genetic algorithm takes the fitness function as the evolutionary goal and can only evolve towards a larger value of the fitness function, with a reasonable transformation between the fitness function and the objective function. The network deviation in evolution is a nonzero positive number; then assume that the population size is N, the individuals within the population are f_i, $F(f_i)$ denotes the individual fitness value, and the individual f_i selection probability P_i is calculated analytically as follows:

$$P_i = \frac{F(f_i)}{\sum_{i=1}^{N} F(f_i)}. \quad (4)$$

The design process of the selection operator is described in detail as follows; first, the cumulative probability Pi is calculated:

$$P_i = \sum_{i=1}^{N} P_i, \quad (i = 1, 2, \ldots, N). \quad (5)$$

A random value θ is generated in the interval (0, 1), and if $\theta \in (P_i, P_i - 1)$ is satisfied, the individual f_i enters the next-generation population. Repeating the above steps, the N chromosomes needed for the offspring population are obtained. Based on this type of selection method, individuals with higher fitness values have a higher chance of being selected, and individuals with lower fitness values also have the possibility of being selected. The optimal selection strategy is introduced at the time of selection, and the best individuals of each generation are directly stored in the offspring. The crossover and variation operators have two key covariates: the exchange chance P_c and the variation chance P_d. The selection of these two covariates is crucial to the global performance of the algorithm. To prevent premature convergence, the adaptive P_c and P_d approach is used, where P_c and P_d change according to the adaptive function of the solution in the following procedure:

$$P_c = \begin{cases} (f_{\max} - f')(f_{\max} - f_{\arg}), & f' > f_{\arg}, \\ 1, & f \le f_{\arg}, \end{cases}$$
$$P_d = \begin{cases} (f_{\max} - f)(f_{\max} - f_{\arg}), & f > f_{\arg}, \\ 1, & f \le f_{\arg}, \end{cases} \quad (6)$$

where $f_{\max}$ is the highest fitness, f_{avg} is the mean value of fitness, f' is the higher individual fitness of fitness function within crossover individuals, and f is the fitness of mutant individuals. The crossover calculation is the most critical genetic operation, in which the parent chromosomes are selected according to the crossover chance Pc, and the crossover is used to generate completely new chromosomes to continuously expand the search range and finally achieve the global target search. This process, using arithmetic crossover, ensures that the generated progeny is between two parent chromosomes. Arithmetic crossover is a linear combination of two random points x_1, x_2 within the solution space D based on the key properties of the convex search space as follows:

$$\alpha x_1 + (1-\alpha)x_2\alpha \in [0, 1]. \quad (7)$$

Following this feature, assuming that x_1 and x_2 represent the parent chromosomes of the crossover calculation, the resulting offspring are as follows:

$$\begin{cases} x_1' = \alpha x_1 + (1-\alpha)x_2, \\ x_2' = \alpha x_2 + (1-\alpha)x_1, \end{cases} \tag{8}$$

where α is a random constant taking values in the range [0, 1]. xi gene locus xi variation process is in the interval x_1, x_2 arbitrary selection of a number x instead of x_i; the interval x_1, x_2 is calculated by the following expression:

$$\begin{cases} x_1 = x_{\min} - \left|\dfrac{x_{\min} \times P_d \times f}{f_{\max}}\right|, \\ x_2 = x_{\max} - \left|\dfrac{x_{\max} \times P_d \times f}{f_{\max}}\right|, \end{cases} \tag{9}$$

where $x_{\max}$ and $x_{\min}$ are the upper and lower limits for the selection of x_i values, and P_d is the variation chance. It can be seen that the variation interval is smaller for individuals with high fitness and larger for individuals with low fitness, which ensures the search performance of the genetic algorithm while reducing the damage of the variation operation to the good individuals.

3. Accuracy Evaluation

Case Analysis. After repeated tests, we summarized the above multisource data fusion scheme and applied it to a local housing and land integration project. From the successive fusions, we found that the accuracy of the alignment between different data using a unified coordinate system and using control measurements is better than the scheme of manually adding control points at a later stage, and the difference in point plane error is much smaller than that in elevation. In order to better demonstrate the reliability of the two schemes in large-scale modeling and mapping projects, we combined the above two schemes, i.e., the combination scheme of laying a small number of control points in the first stage and manually adding control points in the later stage. As shown in Figure 2, the preprocessed airborne LiDAR point cloud data were tested at the height of 50 m to ensure sufficient points per m^2 and sufficient resolution of the orthophoto. The number of point clouds in the figure is shown in mixed form, including their elevation and intensity information. Figure 3 gives the image point cloud data after the fusion of the airborne LiDAR point cloud with the orthophoto. In this part of the work, we use the TerraScan platform to assign the grayscale values of the pixels in the orthophoto with the corresponding coordinates to the point cloud based on the (x, y) position properties of the discrete points of the LiDAR data in the plane coordinate system, making it rich in spectral image texture information. Since the process does not have multiple LiDAR points within a pixel, this fusion method does not have overlap and interpolation problems [21–23].

In order to compare the model accuracy before and after fusion, we examined 18 feature points and quantitatively analyzed the overall planar mid-error and elevation mid-error of the model. The differences between the model acquisition points and the measured coordinates of the surface are shown in Table 1, and according to equations (7)–(9), the median error in the plane before fusion is 0.116 m and the median error in elevation is 0.165 m. After fusion, the median error in plane is 0.084 m and the median error in elevation is 0.093 m. The results show that although both meet the requirements of 1 : 500 cadastral survey, i.e., the median error in plane is less than 0.6 mm on the map and the median error in elevation is less than 1/3 contour distance (0.333 m), the accuracy of the 3D model after the fusion of multisource data is significantly better than that before the fusion, especially the elevation accuracy, which is significantly improved compared with that before the fusion. The relevant data are shown in Table 3.

$$\begin{aligned} M_{p/f} &= \sqrt{\sum_{i=1}^{n} \frac{\Delta s^2}{18}} = 0.116\,\text{m}, \\ M_{p/b} &= \sqrt{\sum_{i=1}^{n} \frac{\Delta s^2}{18}} = 0.084\,\text{m}, \\ M_{h/f} &= \sum_{i=1}^{n} \sqrt{\frac{\Delta h^2}{18}} = 0.165, \\ M_{h/b} &= \sum_{i=1}^{n} \sqrt{\frac{\Delta h^2}{18}} = 0.093. \end{aligned} \tag{10}$$

4. Data Integration under the Urban Landscape Design and Maintenance Management Technology Enhancement

With the continuous development of social economy, people's living standard has been significantly improved, and higher requirements have been put forward for the living environment. In this situation, the relevant departments of the state attach great importance to the construction of urban landscaping projects. In the urban landscaping project, landscape design and maintenance management are the two core components. Only by fully realizing the importance of landscape design and maintenance management in urban landscaping can we apply the correct landscape design method and scientific maintenance management measures to improve the construction quality of China's urban landscaping projects and lay a good foundation for the ecological development of the city.

4.1. Landscape Design Analysis of Urban Landscaping. A good landscape design plays a very important role in improving the quality of the urban landscape, improving the living standard of urban residents, and promoting urban economic development. It is the key factor in evaluating the effect of the urban greening project. Urban landscape design mainly integrates the use of urban architecture, botanical

Table 3: Statistics of plane and elevation errors of feature inspection points/cm.

Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ΔX_f	4	5	−5	−2	−6	−7	−6	5	8	10	9	−7	6	7	11	14	7	−9
ΔX_b	3	−3	3	2	5	4	−5	3	5	−7	6	5	−6	4	7	9	6	−6
ΔY_f	7	−9	12	9	7	6	8	6	5	−7	10	11	7	8	13	8	9	−11
ΔY_b	5	−6	11	8	6	3	5	−3	5	6	8	8	−6	4	10	7	5	6
Δh_f	10	13	−21	9	18	15	19	12	−10	12	15	20	22	17	−23	−16	18	17
Δh_b	6	6	12	5	10	−6	10	8	7	8	11	−12	13	10	13	−10	6	9

Table 4: Effects of different factors.

Category	Human input	Financial support	Technical improvements	Cultural landscape	Planting varieties	Regional elements
Vegetation stability	0.3	0.4	0.4	0.2	0.3	0.25

specialties, and aesthetic expertise to design and plan the natural environment and landscape of the city. The approach to urban landscape design can begin with the use of existing topographical conditions and the scientific matching of garden plants. In the past, many elements such as rockeries, pavilions, and green lawns were used in the landscape design of urban garden areas, resulting in a large number of landscape designs that are too similar and make people aesthetically tired. Expand the landscape design ideas and use diversified ideas and rich and varied forms to design a creative urban landscape that meets the needs of people's lives [24, 25].

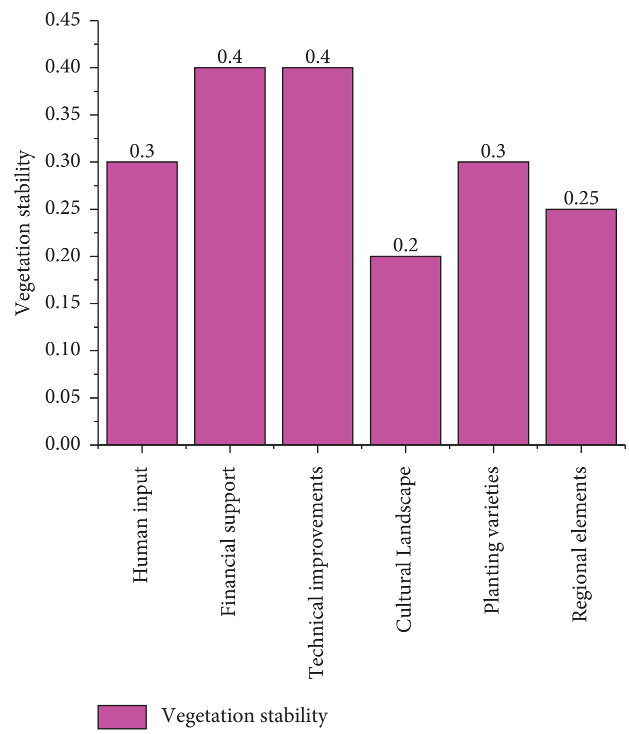

Figure 6: The influence of each factor on the growth of vegetation.

4.2. Analysis of Maintenance Management of Urban Landscaping. Urban landscaping maintenance is an important way to realize the sustainable development of urban landscaping. It is an important way to improve the survival rate of landscaping plants and give full play to the social benefits of urban landscaping. Plants in urban landscaping are in a state of constant growth, and only through human management can the aesthetics of the plants be improved, so a reasonable evaluation of garden management and maintenance is needed [26–28].

Firstly, the survival rate of some vegetation in urban landscaping is very low and the original green area is very limited. Only by investing a large amount of human, material, and financial resources and doing a good job of the corresponding maintenance management in terms of technology and funds can the landscape design results of urban gardening reach the expected goals. Secondly, the overall quality of people varies, and there are uncivilised phenomena such as damaging the landscape and trampling on the lawn in daily life. Doing a good job of the corresponding maintenance management can fundamentally improve the construction effect of urban landscaping projects. In order to improve the professional quality of staff and do a good job in urban gardening maintenance and management, it is necessary to improve the professional quality of staff. First of all, the construction of gardening and greening projects has complexity, and the requirements for staff are relatively high. Staff can only do a good job in the construction and maintenance of gardening projects if they have a certain knowledge of gardening and understand biology and ecology. However, at the present stage, a considerable part of the staff has neither sufficient theoretical knowledge nor accumulated rich working experience, so it is necessary to improve their professional level through training. Secondly, establish the corresponding supervision and management mechanism and assessment mechanism. Regularly assess and evaluate the staff. Combined with the final assessment and evaluation results, appropriate rewards and punishments are made to improve the motivation of the staff's work. Lay a good foundation for improving the efficiency of urban landscaping maintenance and

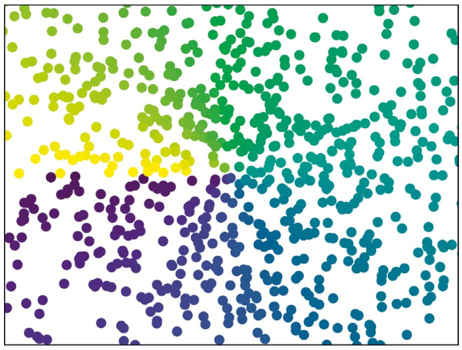

Figure 7: Influence of factors on the management situation of green landscape.

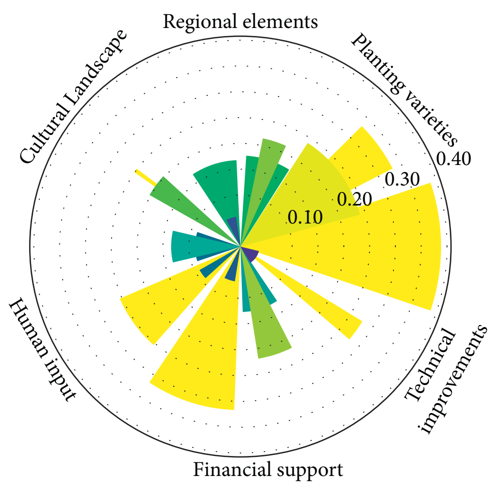

Figure 8: Prominent impact of factors.

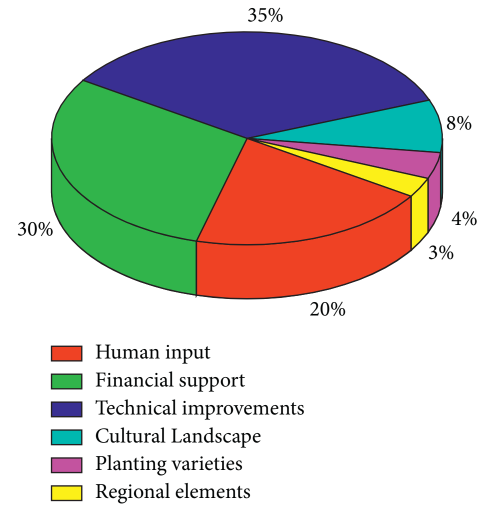

Figure 9: Percentage of each influencing factor.

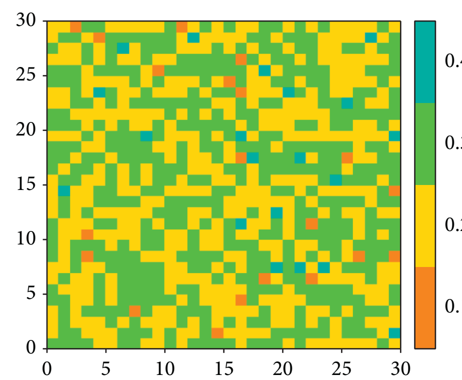

Figure 10: Efficiency of landscape maintenance in the region.

management work. To optimize the maintenance management technology, it is necessary to optimize the maintenance management technology [29, 30].

Based on the aforementioned landscape changes in the 3D model to analyze and compare human input, financial support, technical improvements, cultural landscape, planting species, and regional elements, as shown in Table 4.

These factors in Table 3, which are relevant to plant growth in the garden, are further represented in Figure 6.

The growth of vegetation in the gardens in Figure 6 is still mainly supported by economics over technology. This is further reflected in the main factors of landscape maintenance and management. Through the influence of each factor on the vegetation, we can further improve and evaluate the problems in the maintenance and management of urban landscapes. This is a contribution to the improvement of landscape maintenance and management, as shown in Figure 7.

Figure 7 shows the distribution of the factors in regional vegetation management, giving a clear picture of how each factor has a place in the vegetation management process. The value of their contribution can further be understood in Figure 8.

Throughout the management evaluation distribution in Figure 8, the yellow areas are clearly the most prominent in terms of value, or where the intersection of the two areas is more prominent for plant maintenance growth, which would be an important evaluation or noteworthy key for garden maintenance management. Therefore, it is important to focus on the human investment, financial support, and technical improvement to achieve the optimal management of the original maintenance further by transforming the relationship, as shown in Figures 9 and 10.

Figure 9 provides an understanding of the share of each factor in landscape maintenance and the development of landscape maintenance efficiency within the region. It can be largely established that economics and technology are the most intuitive influences on the maintenance of urban gardens. It has an important and significant influence on the maintenance of the landscape and the ways and means of landscape maintenance. Figure 10 shows the distribution of maintenance efficiency in an area, which can be seen to show a different distribution of maintenance efficiency due to the inconsistent level of management within the area.

5. Conclusion

This article shows that multisource data fusion has higher accuracy by briefly discussing the impact of multisource data fusion on 3D modeling accuracy. It is further derived that the landscape effect of multisource data 3D modeling is used to evaluate the important factors affecting the urban landscape. The analysis of factors affecting the landscape is used to maintain and manage the urban landscape, which is also directly related to the benefits of urban landscaping. Therefore, the data fusion 3D landscape modeling-maintenance evaluation approach is well suited to ensure that the economic and social benefits of urban landscaping are enhanced.

Data Availability

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

Conflicts of Interest

The author declares that he has no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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