Combined with local neighborhood characteristics and remote sensing image fusion method of C-BEMD

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Abstract—For the sake of ameliorate the high resolution recognition capacity building remote sensing images, a remote sensing image fusion method based on local neighborhood characteristics and C-BEMD is advanced. The building remote sensing image acquisition model and the building remote sensing image picture element edge feature detection model are designed. The wavelet multi-scale denoising method is used to suppress the fuzzy spread of picture element feature points between image residual units, extract the geometric feature points of image sequence, and process the building remote sensing image block by block. The global residual learning and message fusion of building remote sensing image are implemented. The local neighborhood feature matching method is used to reconstruct the building remote sensing image region. Combined with the C-BEMD empirical mode decomposition method, the building remote sensing image fusion and feature point matching in affine region are implemented, and the block image template matching method is used to realize the automatic fusion and recognition of building remote sensing image. Simulation results show that this method has high precision in constructing remote sensing image fusion and good positioning performance in constructing remote sensing image feature points.

Keywords—C-BEMD, image fusion, Local neighborhood characteristics, picture elements, remote sensing, residual learning.

I. INTRODUCTION

Image integration is a multi-level, multi-level and multi-directional comprehensive processing technology for two or more images with complementary message and redundancy. Compared with the source image, the integration image contains more message, more clear vision, and more suitable for human visual perception and computer processing. Image integration method based on multi-resolution analysis has become a research hotspot in the field of image integration. The key of this kind of integration method lies in the selection of image multi-scale decomposition tools and the formulation of integration rules. As an important multi-scale decomposition tool, wavelet transform has been widely used in the field of image integration. However, in the process of wavelet decomposition, the result of decomposition depends on the given wavelet function, and the adaption is poor. With the development of image processing technology, the application of digital image is more and more extensive, among which remote sensing image is one of the most important directions. Remote sensing image has the advantages of wide coverage, large amount of message and durability, and plays an important role in industry, agriculture, military and other fields [1]. High resolution remote sensing image not only has higher picture element density and finer quality, but also can provide rich image details, which is beneficial to the follow-up processing of remote sensing data. However, it is difficult to obtain HR remote sensing images directly because of the limitation of various factors [2]. Therefore, this paper uses super-resolution (SR) reestablishsion algorithm to ameliorate the resolution of remote sensing images.

Automatic image managing technology is approved to classify and manage building remote sensing images, building remote sensing image analysis model is established, building remote sensing image message tracking and identification is implemented in combination with image picture element sequence distributed integration method, and building remote sensing image message processing capability is ameliorated [3]. Research on related building remote sensing image processing technology has received great attention. Classification and processing of building remote sensing images are based on photo integration. Fuzzy message integration technology is approved to fuse remote sensing images of buildings, and automatic extraction method of feature mark points is approved to ameliorate feature analysis capability of sequence mark points of remote sensing images of buildings. The categorization method of building remote sensing image sequence marker points is based on noise reduction, image integration and feature extraction of building remote sensing images [4]. By automatic message integration and feature recognition processing of building remote sensing images, the categorization detection of building remote sensing images is implemented, and the classification recognition capability and message management capability of building remote sensing images are ameliorated [5]. This paper proposes a remote sensing image integration algorithm for buildings based on local neighborhood characteristics and C-BEMD (Compatible two dimensional empirical mode decomposition). In Section 2, the building remote sensing image acquisition model and the edge feature detection algorithm of building remote sensing image picture element points are designed. The local neighborhood feature matching method is approved to reconstruct the building remote sensing image region. In Section 3, the building remote sensing image integration and feature point matching are implemented in the affine invariant region. The image block template matching method is approved to realize the automatic integration recognition of the building remote sensing image. Finally, in Section 5, the simulation test analysis is implemented and the validity conclusion is drawn.

II. Basic Definitions

A. Picture Element Sequence Sampling of Remote Sensing Images of Buildings

The existing building remote sensing image acquisition is not accurate, a building remote sensing image acquisition model and an edge feature detection model of building remote sensing image picture element points are designed, fuzzy distributed picture element feature points between residual units of the building remote sensing image are suppressed by adopting a wavelet multi-scale noise reduction method, picture element feature point detection of a building remote sensing image sequence is implemented by adopting a principal component analysis method, building remote sensing image processing and feature analysis are implemented, and a generation sequence of geometric invariant moments of the building remote sensing image is constructed as follows:

$$Dif(C_1,C_2)=\min_{v_i\in C_1, v_j\in C_2, (v_i,v_j)\in E} w((v_i,v_j)) \quad (1)$$

In the above formula, $w(v_i,v_j)$ represents a feature sampling point of a building remote sensing image, and the feature point of the building remote sensing image is composed of a feature vector corresponding to the main feature worth of the edge contour of the image [6]. In the unknown picture element space, the sample sequence of the building remote sensing image is recombined to obtain the distributed affine region of the building remote sensing image constructed by k neighboring points, geometric feature reestablishsion is implemented in conformity with the weak edge characteristic quantity of the building remote sensing image, the distributed message integration model of the building remote sensing image is acquired, and the block feature matching model of the building remote sensing image is acquired as exhibition in Fig. 1.

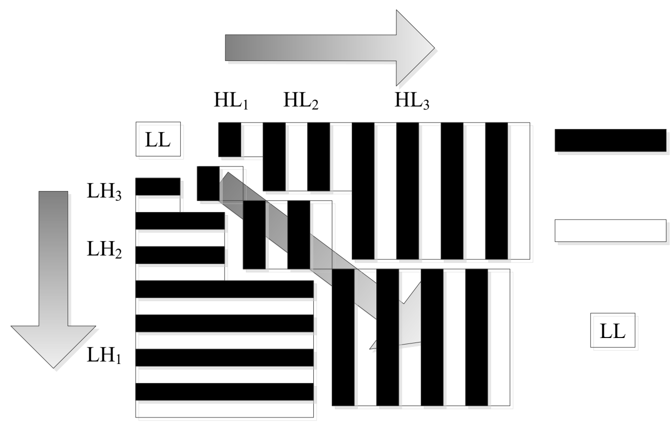

Fig. 1 block model of building remote sensing image

In conformity with Fig. 1, a fuzzy message tracking identification method is approved to implement classified clustering of building remote sensing images [7], and a large data integration method is approved to implement feature block subspace clustering of building remote sensing images, thus obtaining local dynamic feature point detection output of building remote sensing images as follows:

$$I(x)=J(x)t(x)+A(1-t(x)) \quad (2)$$

wherein, A is the edge contour feature of building remote sensing images in different picture element clustering spaces, $t(x)$ is the maximum block picture element worth of building remote sensing images, and $J(x)t(x)$ is the picture element intensity of building remote sensing images [8].

In conformity with the gradient message and edge contour message of the building remote sensing image, the gray picture element worth of the building remote sensing image is computed, and the difference feature matching method is approved to obtain the estimated worth of the 3D feature reestablishsion contours area spread of the building remote sensing image as follows:

$$NLM[g](i)=\sum_{j\in\Omega} w(i,j)g(j) \quad (3)$$

The affine invariant region integration of the building remote sensing image is implemented with the picture element point i as the center, and the characteristic spread coefficient of the three-dimensional feature reestablishsion of the building remote sensing image satisfies $0\le w(i,j)\le 1$ and $\sum_{j\in\Omega} w(i,j)=1$. It is supposed that the block feature spread of building remote sensing image, the picture element sequence satisfies $n\in N(0,\sigma_n^2)$, where σ_n^2 is the imaging picture element intensity of building remote sensing image [9]. in conformity with the spread of the three-dimensional message feature points of the image, the block feature matching method is approved to fuse the three-dimensional message of the building remote sensing image [6], and the three-dimensional imaging contour detection equation of the building remote sensing image is acquired as follows:

$$\begin{aligned}\frac{\partial\phi}{\partial t} = -\delta(\phi)[\theta\left(\lambda_1 e_1^{LBF} - \lambda_2 e_2^{LBF}\right) \\ +(1-\theta)\left(\lambda_1 e_1^{LGF} - \lambda_2 e_2^{LGF}\right)] \\ +v\delta(\phi)div(\frac{H(\phi)}{\left|H(\phi)\right|}) \\ +\mu\left(H^2(\phi) - div(\frac{H(\phi)}{\left|H(\phi)\right|})\right)\end{aligned} \tag{4}$$

wherein

$$\begin{cases} e_1^{LBF} = \int_\Omega K_\sigma(y-x)\left|I(x)-f_1(y)\right|^2 dy \\ e_2^{LBF} = \int_\Omega K_\sigma(y-x)\left|I(x)-f_2(y)\right|^2 dy \end{cases} \tag{5}$$

$$\begin{cases} e_1^{LGF} = \int_\Omega K_\sigma(y-x)\left|I^G(x)-f_1^G(y)\right|^2 dy \\ e_2^{LGF} = \int_\Omega K_\sigma(y-x)\left|I^G(x)-f_2^G(y)\right|^2 dy \end{cases} \tag{6}$$

where $H(\phi)$ is the block Heaviside function of the building remote sensing image sequence, and $\delta(\phi) = \frac{d}{dz}H(\phi)$ is the picture element gray worth of the building remote sensing image, K_σ is picture element edge worth. Point tracking is implemented on the building remote sensing image sequence, and picture element sequence sampling of the building remote sensing image is implemented [10].

B. Dynamic Characteristics Analysis of Remote Sensing Images of Buildings

When mapping dynamic feature mark points of building remote sensing images into undirected maps, weight worth is defined for each edge, and associated feature points of building remote sensing images are distributed in a spatial spread domain $C_1, C_2 \subseteq V$, and gray message feature spread sets of building remote sensing images are as follows:

$$\mu_{pq} = \sum_{m=1}^{M}\sum_{n=1}^{N}(x-\bar{x})^p(y-\bar{y})^q f(x,y) \tag{7}$$

First-order moments m_{01} and m_{02} respectively represent fuzzy feature quantities of the edges of dynamic feature landmarks of building remote sensing images. Wavelet multi-scale noise reduction method is approved to suppress fuzzy distributed picture element feature points between residual units of building remote sensing images, geometric feature points of building remote sensing image sequences are extracted [8] [11], and block processing of building remote sensing images is implemented to obtain center distance:

$$n_{pq} = \frac{\mu_{pq}}{\left(\mu_{00}\right)^\gamma} \tag{8}$$

μ represent picture element sequence. The wavelet denoising method is approved to suppress the disturbance sequence of the building remote sensing image and obtain the third-order central moment. The spread characteristic quantity of imaging picture elements of the building remote sensing image is expressed as follows:

$$I1 = \frac{n_{20}n_{02} - {n_{11}}^2}{{n_{00}}^4} \tag{9}$$

$$E_m^{ij} = \sum_{k=0}^{255} e_{mk}^{ij} \tag{10}$$

$$e_{mk}^{ij} = \begin{cases} -p_k \log(p_k) & , p_k \neq 0 \\ 0 & , p_k = 0 \end{cases} \tag{11}$$

In the above formula, p_k is the statistical probability that the gray picture element worth of the building remote sensing image is k. In the picture element spread space F, there is an $L > 0$. The dynamic feature reorganization of the building remote sensing image is implemented, and the gray picture element spread model of the building remote sensing image is acquired as follows:

$$p_{i,j}(A) = \begin{cases} \frac{w_{i,j}}{w_i} & if \ \ i \neq j \ and \ e_{i,j} \in A \\ 0 & if \ \ i \neq j \ and \ e_{i,j} \notin A \\ 1 - \frac{\sum_{j:e_{i,j}\in A} w_{i,j}}{w_i} & if \ \ i = j \end{cases} \tag{12}$$

If the gray scale feature edge picture element set of the building remote sensing image is A, combining with the feature segmentation result of the building remote sensing image, the picture element histogram is $S = \{S_1, S_2, ..., S_{N_A}\}$. In conformity with the above processing, combining with RGB feature decomposition technology, the message integration and feature reestablishsion of the building remote sensing image are implemented [12].

C. C-BEMD Algorithm for Image Integration

Strictly speaking, C-BEMD algorithm is not a real two-dimensional empirical mode decomposition, it just uses one-dimensional EMD in the order of first and second column to cross each row vector and column vector of image matrix, so it can only obtain the detail message in the horizontal and vertical directions of image, and it is easy to produce linear edge effect in the process of image integration, which destroys the continuity of image It is adaptive and completely dependent on data, so when it processes an image, it will choose the number of IMF decomposition in conformity with the actual needs. In the image integration system, the source image is usually two or more images, and the decomposition layers of the image to be fused are the same. If each image in the image integration system is decomposed by EMD (Empirical Mode Decomposition) separately, the IMF acquired under the given termination conditions is met. The number is often different, which leads to the frequency mismatch between the IMF component and the residual component. CEMD is advanced to settle this problem. It joins the row vector of the source image matrix into a complex vector, and then CEMD it. The real and imaginary parts of the decomposed vector are extracted as the

IMF (International Monetary Fund) component and the residual component of the two images, respectively Simultaneous decomposition. Both LCEMD and CEMD include row by row operation of image matrix. In addition, EMD itself is time-consuming, which undoubtedly increases the time cost and computation. The algorithm proceed as follows:

Step 1. Input the image and the number of layers of image decomposition;

Step 2. The input image is respectively extended by point equivalence to prevent endpoint effect, and finally the extended image matrix is acquired;

Step 3. Initialization. Assume that the number of layers = 1, trend image RI, j = I I (I = 1, 2), and assume that the maximum number of iterations is K (generally 3);

Step 4. Compute the jth IMF, i.e. enter the screening process;

Step 5. Extract the decomposition result from the extension image.

Finally, after n layer decomposition, the source image can be acquired.

The bimf component of the image often retains some details of the image, such as the edge, texture, line, etc. for bimf component. For the sake of make the image visual effect better and the details more prominent after integration, in this paper, the integration coefficient is acquired by the method of combining local area energy with weighting and selection. This method accords with the characteristics that the human eye is not sensitive to the gray worth of a single picture element, but more sensitive to the features of the picture elements in the local area. Moreover, the central image with large local area energy often represents the significant features of the image.

III. Integration Algorithm For Remote Sensing Images Of Buildings

A. Extraction of Geometric Feature Points from Remote Sensing Image Sequence of Buildings

The local neighborhood feature matching method is approved to reconstruct the building remote sensing image region, the building remote sensing image integration and feature point matching are implemented in the affine invariant region, the scale factor of the marker point tracking of the building remote sensing image sequence [13], and the probability of occurrence of edge picture elements of the building remote sensing image is as follows:

$$P(r(t+\Delta)) = \begin{cases} r_{ij}\Delta + o\Delta \\ 1 + r_{ij}\Delta + o\Delta \end{cases} \tag{13}$$

If $\Delta > 0$ and $r_{ij} > 0$ are included, the three-dimensional message feature reestablishsion of the building remote sensing image is implemented in the affine invariant region of the building remote sensing image, $R(t)$ is set as the picture element equilibrium worth in the spatial $(\Omega, F, f(x), P)$ of the building remote sensing image spread domain, $S = \{1, 2, ..., N\}$ represents the color characteristic component of the building remote sensing image, and the equilibrium coefficient of the building remote sensing image is acquired by combining the stable matching technology of dynamic marker points as follows:

$$C(i) = \sum_{j=0}^{i} p_i(j) = \sum_{j=0}^{i} \frac{n_i}{n}, \ i \in 0, \ldots, L-1 \tag{14}$$

Assuming that the dynamic feature mark point of the building remote sensing image is G, the correlation characteristic quantity between $G_{\min}$: $G_{\max}$ of gray picture element feature spread range of the building remote sensing image is:

$$g = G_{min} + (G_{min} - G_{max})C(G) \tag{15}$$

Using block integration technology, each building remote sensing image is divided into equal $n_c \times n_r$ sub-image blocks, and using large data mining method, building remote sensing images are fused [14].

B. Realization of Building Remote Sensing Image Integration

The building remote sensing image integration and feature point matching are implemented in the affine invariant region, and the automatic integration recognition of the building remote sensing image is realized by adopting an image block template matching method. The output building remote sensing image enhancement model is as follows:

$$g(x, y) = f(x, y) + \varepsilon(x, y) \tag{16}$$

where, $f(x, y)$, $g(x, y)$, $\varepsilon(x, y)$ respectively represent the subdivision feature of the building remote sensing image in the highlight region, assuming the geometric feature vector $\mathbf{e}_1, \mathbf{e}_2, ..., \mathbf{e}_l$ of the building remote sensing image in the first l picture element set, reconstructing the contour spread feature points, calculating the fuzzy characteristic quantity of the building remote sensing image, obtaining the matching size of the block integration feature as $s \times s$, and the entropy of each image block is expressed as:

$$d_{mn}^{ij}(x, y) = \begin{cases} \dfrac{\sum_{k=-s}^{+s} \left| \theta_m^{ij}(x+k, y+k) - \theta_n^{ij}(x+k, y+k) \right|}{(2s+1)^2}, & m \neq n \\ 0 & , m = n \end{cases} \tag{17}$$

where m and n are image numbers, and i and j are row and column numbers of marker points of remote sensing images of buildings. The characteristic quantity of fuzzy degree message is:

$$Int(C) = \max_{e \in MST(C,E)} w(e) \tag{18}$$

The key to the automatic tracking of dynamic feature mark points of the image is the detection of edge angle feature points of the image. in conformity with the above analysis, the image block template matching method is approved to realize the automatic integration recognition of building remote sensing images [15].

C. Steps of Integration Algorithm

Taking two image integration as an example, it is supposed that the two source images are A and B respectively, and they have been strictly registered [16] [17]. Fig. 2 shows the structure diagram of the algorithm in this paper, where IC-BEMD represents the inverse transformation of C-BEMD. The steps of the image integration method combining local neighborhood characteristics and C-BEMD advanced in this paper are as follows:

Step 1. Take the source image A and B as the input image, decompose the source image A and B in J layer in conformity with the C-BEMD algorithm, and obtain J $BIMF_j^A$ and $BIMF_j^B$, and a residual component R_A and R_B, respectively.

Step 2. For the decomposed J $BIMF$ components, i.e. high frequency components, the $BIMF$ components of the fused image $BIMF_j^F$ are computed.

Step 3. For the residual component acquired by decomposition, i.e. the low frequency component, the residual component RF of the fused image is computed

Step 4. Overlay the integration $BIMF$ component and residual component to obtain the final integration image.

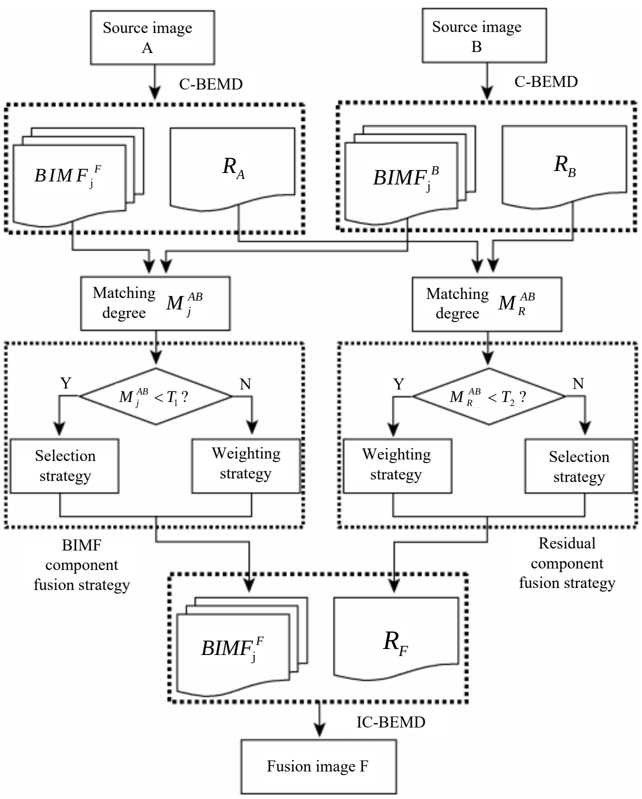

Fig. 2 structure of integration algorithm

IV. Simulation Test Analysis

The purpose of remote sensing image integration method combined with local neighborhood characteristics and C-BEMD is to obtain clear images of all targets, so as to eliminate the focus and defocus differences of source images. In the experiment, regression analysis and statistical analysis method are used to compute the image data. The computer uses ppc23710 to complete the statistics. The main frequency is 21.1 GHz, the memory is 1 GB, and the software development tool is Microsoft Visual C + + 610.The picture element level for initial sampling of remote sensing images of buildings is 600×600, the interference signal-to-noise ratio for sampling of remote sensing images of buildings is -12dB, the gray scale feature spread sets are $a_1 = (0.4, 0.9, 0.9)$, $a_2 = (0.6, 0.7, 0.6)$, the number of remote sensing images of buildings is 1600, and the remote sensing images of buildings are identified in different remote sensing databases, as exhibition in Fig. 3.

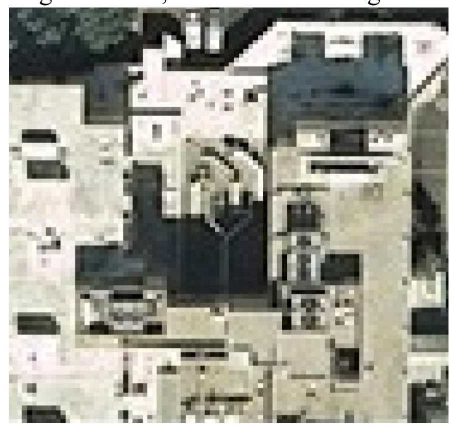

Fig. 3 original remote sensing image

Taking the building remote sensing image of Fig. 3 as the research object, the building remote sensing image is reconstructed, and the reconstructed result is exhibition in Fig. 4.

Fig. 4 reestablishsion results of remote sensing images of buildings

In conformity with the reestablishsion result of the building remote sensing image in Fig. 4, the building remote sensing image is fused, and the fused result is exhibition in Fig. 5.

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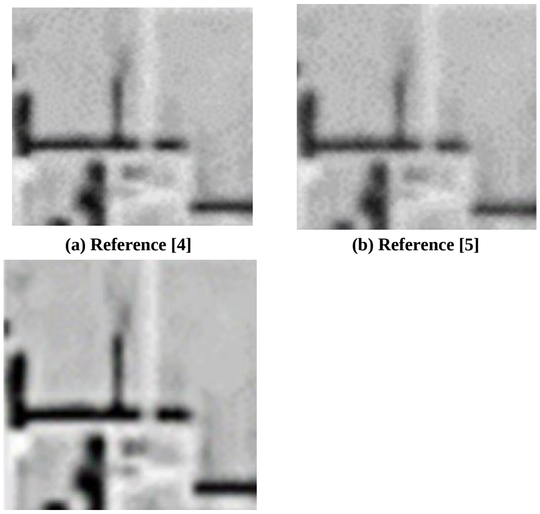


(a) Reference [4] **(b) Reference [5]**

(c) This method

Fig. 5 results ding remote sensing image integration

The method in this paper has high accuracy for building remote sensing image integration and good positioning performance for feature points of building remote sensing image. in conformity with the image integration results, building remote sensing image recognition is implemented, and the application of building remote sensing image integration to recognition rate is tested. The results are exhibition in Fig. 6.

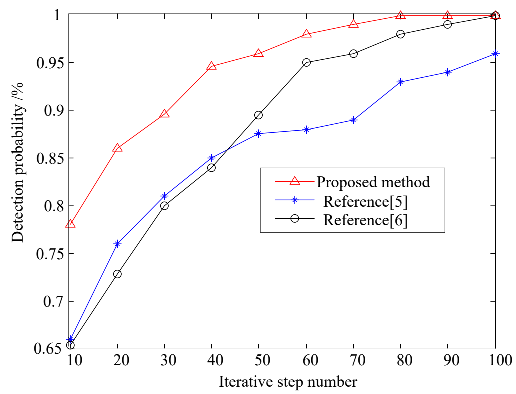
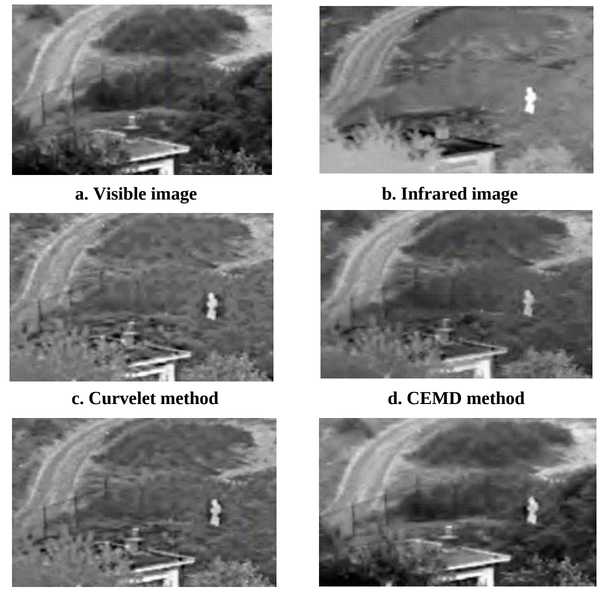


Fig. 6 comparison of integration performance of remote sensing images of buildings

The above simulation results shows that the accuracy of building remote sensing image integration using this method is higher, the positioning performance of building remote sensing image feature points is better, and the recognition and optimal management capability of building remote sensing image are ameliorated.

For the sake of further verify the feasibility of the image integration method combining local neighborhood characteristics and c-bemd, the infrared and visible image integration experiments are implemented. In the integration experiment of infrared and visible image, infrared image and visible image often have different spectral message: The imaging sensor based on visible light uses the spectral characteristics of the surface reflection of the object to form the image, while the imaging sensor based on infrared uses the thermal radiation characteristics of the object itself to form the image. The visible image can display the environment message in the scene well, while the infrared image mainly shows the existence characteristics of the target. Fig. 7 and Fig. 8 respectively show a group of integration examples of infrared and visible image.



a. Visible image **b. Infrared image**

c. Curvelet method **d. CEMD method**

e. NSCT method **f. Article method**

Fig. 7 integration results of the first group of infrared and visible images

It can be seen that the integration images acquired by the four methods can effectively combine the message provided by the source image, make full use of the complementarity between the message, and achieve better observation purposes. By careful comparison with Fig. 7, it can be seen that not only some edge details of the integration images of curvelet method, CEMD method and NSCT (Nonsubsampled Contourlet) method are relatively fuzzy (such as the bottom part of the image), but also some edge details are introduced to some extent. The integration image of this method not only retains the scene message in the visible image, but also injects the hot target message in the infrared image, and its edge details are clearer, the virtual shadow phenomenon is eliminated more thoroughly, and the integration effect is better than the other three integration methods.

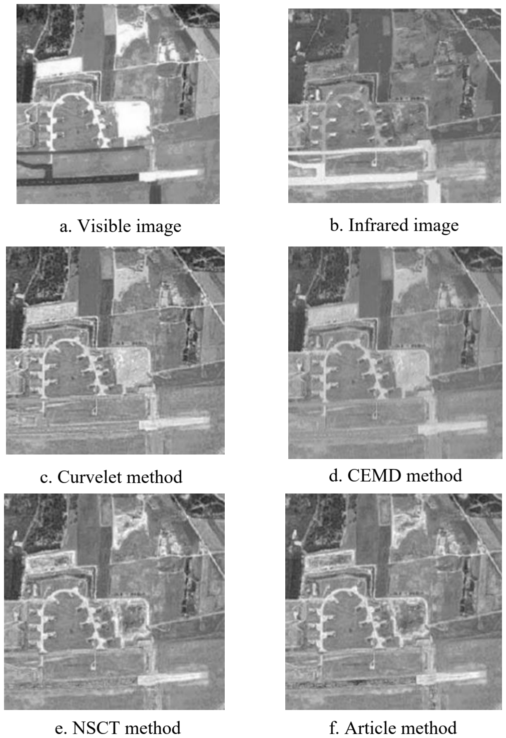


Fig. 8 integration results of the second group of infrared and visible images

It can also be seen from the observation of Fig. 8 that the four methods ameliorate the definition and contrast of the image, and integrate the complementary message of infrared and visible image; However, by comparing the four integration results, it is found that the integration effect of the three traditional methods is poor, while the integration effect of this method is better. This is because this method not only effectively retains the details of the visible image (such as the airport runway at the bottom), but also has the highest resolution and the least distortion effect.

Table I and Table II shows the objective performance evaluation of the integration experiment in Figs. 7-8. It can be seen from Tables I - II that the method in this paper is larger than other methods in Ag, SD and qAB/F, while Ag reflects the clarity of the image and SD reflects the contrast of the image, which is consistent with the visual effect.

Table I. Objective performance evaluation of integration image in Fig. 7

Integration method	Evaluating indicator				
	IE	AG	SD	MI	$Q^{AB/F}$
Curvelet	6.58	9.450	8.30	3.81	0.418
CEMD	6.53	8.92	7.93	4.03	0.399
NSCT	6.65	9.85	8.39	3.91	0.423
Article	6.98	10.75	8.79	3.97	0.488

Table II. Objective performance evaluation of integration image in Fig. 8

Integration method	Evaluating indicator				
	IE	AG	SD	MI	$Q^{AB/F}$
Curvelet	7.05	6.39	9.15	2.60	0.456
CEMD	6.90	5.19	9.12	2.74	0.438
NSCT	7.12	6.71	9.18	2.65	0.438
Article	7.17	6.93	9.24	2.71	0.500

Tables I - II show the objective performance evaluation of the integration experiment in Figs. 7-8. It can be seen from Tables I - II that the method in this paper is larger than other methods in Ag, SD and qAB/F, while Ag reflects the clarity of the image and SD reflects the contrast of the image, which is consistent with the visual effect. This is because this method uses the fuzzy message tracking recognition method to classify and cluster the building remote sensing image, and uses the big data integration method to cluster the feature subspace of the building remote sensing image.

V. Discuss

Image integration method based on multi-resolution analysis has become a research hotspot in the field of image integration. For the sake of ameliorate the high-resolution recognition ability of remote sensing image, a remote sensing image integration method based on local neighborhood feature and c-bemd is advanced by combining local neighborhood feature and C-BEMD. The main work of this paper is as follows:

(1) The fuzzy message tracking recognition method is used to classify and cluster the building remote sensing image, and the big data integration method is used to cluster the feature subspace of the building remote sensing image.

(2) In conformity with the gradient message and edge contour message of the building remote sensing image, the gray picture element worth of the building remote sensing image is computed, and the estimated worth of the regional spread of the 3D feature reestablishsion contour of the building remote sensing image is acquired by using the differential feature matching method.

(3) The local neighborhood feature matching method is used to reconstruct the building remote sensing image region, and the building remote sensing image integration and feature point matching are implemented in the affine invariant region.

(4) The remote sensing image integration method combining local neighborhood features and continuum features can obtain all clear target images, thus eliminating the focal length and defocus difference of the source image. The accuracy of remote sensing image integration is higher, and the positioning performance of remote sensing image feature points is better, which ameliorates the ability of remote sensing image recognition and optimization management.

Local neighborhood feature and c-bemd remote sensing image integration is of great significance to the development of building image integration recognition, and it is also a hot spot of research and application in the industry. How to apply local neighborhood feature and c-bemd to remote sensing image integration, this paper is to arouse people's attention, and I believe there will be more research results in the future.

VI. Conclusion

In this paper, a building remote sensing image integration algorithm based on local neighborhood characteristics and C-BEMD is advanced. A building remote sensing image acquisition model and an edge feature detection model of picture element points of the building remote sensing image are designed, fuzzy distributed picture element feature points between residual units of the building remote sensing image are suppressed by adopting a wavelet multi-scale noise reduction method, geometric feature points of a building remote sensing image sequence are extracted, block processing of the building remote sensing image is implemented, global residual learning and message integration of the building remote sensing image are implemented in conformity with similarity of different features, local neighborhood feature matching method is approved to reconstruct the building remote sensing image region, building remote sensing image integration and feature point matching are implemented in affine invariant regions, and image block template matching method is approved to realize automatic integration recognition of building remote sensing images. The method in this paper has high accuracy for building remote sensing image integration, good positioning performance for feature points of building remote sensing image, and ameliorated management capability of building remote sensing image. How to reduce the running time of this method and how to apply this method to color image integration will be the problems to be settled in the future.

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Contribution

For the sake of ameliorate the high resolution recognition capacity building remote sensing images, Peili fan proposed a remote sensing image fusion method based on local neighborhood characteristics and C-BEMD is advanced. Fan Peili designed the building remote sensing image acquisition model and the building remote sensing image pixel edge feature detection model. The wavelet multi-scale denoising method is used to suppress the fuzzy spread of picture element feature points between image residual units, extract the geometric feature points of image sequence, and process the building remote sensing image block by block. The global residual learning and message fusion of building remote sensing image are implemented. The local neighborhood feature matching method is used to reconstruct the building remote sensing image region. Combined with the C-BEMD empirical mode decomposition method, the building remote sensing image fusion and feature point matching in affine region are implemented, and the block image template matching method is used to realize the automatic fusion and recognition of building remote sensing image. Simulation results show that this method has high precision in constructing remote sensing image fusion and good positioning performance in constructing remote sensing image feature points.