Synthetic Aperture Radar Based Retrieval Process Using Content-based Image Retrieval

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Abstract--- A creative re-ranking method named fusion similarity-based re-ranking is projected here to estimate the performance of synthetic aperture radar (SAR) image retrieval. First, the top ranked SAR images within the early retrieval results are selected for reranking. Considering the negative persuade of the speckle noise, three SAR-oriented visual features are chosen to represent them. In count, the diverse relevance scores consequent to an SAR image are analyzed in various modalities. Next, a fusion similarity is followed under the relevance score space to compute the equivalence between two SAR images. This fusion similarity is intended using the modal image matrix, which is constructed by the estimated scores to combine the contributions of all modalities. In conclusion, an existing re-ranking function is employed to re-rank the SAR images with the help of the expected scores and calculated fusion similarities. The positive investigational result shows that our re-ranking method is effective and efficient.

I. INTRODUCTION

Synthetic Aperture Radar (SAR) image processing has received increasing attention recently due to the development of the sensors. A large number of SAR images are produced every day by earth observation satellites. It is a hard work to rapidly and accurately find the useful information from those SAR images manually. In order to handle this problem, a popular image processing technology is introduced, that is, content-based image retrieval (CBIR). CBIR is a comprehensive technique, ranging from similarity metric learning to the automatic annotation. As an application of CBIR, remote sensing (RS) image retrieval (RSIR) is increasingly becoming mature. Many RSIR methods have been proposed over the last couples of years. In addition to the normal image content retrieval, some complicated tasks could also be accomplished, such as multi-object relationship analysis. An SAR image content retrieval method was introduced, where the speckle robust similarity distance was used to measure the similarities between SAR images. Jiao *et al.* presented a general purpose SAR image retrieval method based on semi-supervised learning and region-based similarity measure. A fast RSIR method was proposed with the help of hashing technique, aiming at searching the RS images in large archives.

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II. EXISTING SYSTEM

A large number of SAR images are produced everyday by earth observation satellites. It is hard to rapidly and accurately find the useful information from those SAR images manually. CBIR is a comprehensive technique, ranging from similarity metric learning to the automatic annotation. As an application of CBIR, remote sensing (RS) image retrieval (RSIR) is increasingly becoming mature. Re-ranking methods can be divided into two groups: 1) example dependent and 2) example-independent.In the first group, the reranking problem is usually regarded as the binary classification. The users select the positive and negative samples to train a machine learning method for re-ranking. Re-ranking method is actually the relevance feedback (RF) or pseudorelevance feedback (PRF), which is popular in the RS community. The main drawbacks are Efficiency of SAR image retrieval is not sufficient. Hard to

find similarity between SAR image using relevance feedback technique.

III. PROPOSED SYSTEM

To the normal image content retrieval, some complicated tasks could also be accomplished, such as multi object relationship analysis. An SAR image content retrieval method was introduced, where the speckle robust similarity distance was used to measure the similarities between SAR images. A fast RSIR method was proposed with the help of hashing technique, aiming at searching the RS images in large archives. The proposed FSR is the multimodal-based re-ranking method. Compared with the RF/PRF methods, the content similarities between SAR images are emphasized. After that, a modal-image matrix is constructed by the estimated scores. To combine the effects of different modalities, a new resemblance measure named fusion similarity is defined using the modal-image matrix to weigh the relationships between SAR images. For feature extraction, construct two bag-of-visual-words (BOVWs) features for the SAR images first. BOVW feature can be extracted as follows: 1) find interest points of images using scale-invariant feature transform (SIFT), 2) generate the codebook using those interest points; and 3) obtain BOVW features by histogram of code words. The original SIFT algorithm does not consider speckle noise within the SAR images. Advantage of the system, it Gives higher efficiency to SAR image retrieval. Here does not consider the speckle noise within the SAR image. Achieve more similarity result due to proposed technique.

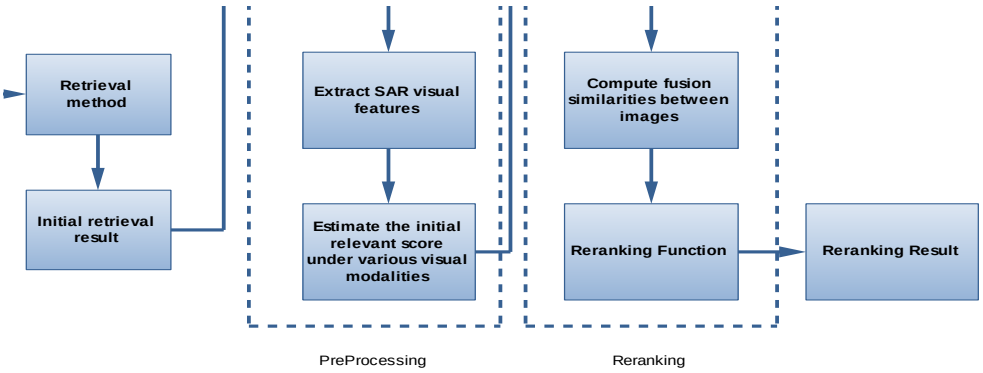

Fig. 1: Proposed Architecture

Retrieval of Image

A large number of SAR images are produced everyday by earth observation satellites. It is hard to rapidly and accurately find the useful information from those SAR images manually.

Image Processing based on Similarity

A model image matrix is constructed by the estimated scores. To combine the effects of different modalities, a new resemblance measure named fusion similarity is defined using the modal-image matrix to weigh the relationships between SAR images.

Preprocessing

There are two steps in the preprocessing part, including multiple SAR-oriented visual features extraction and initial relevance scores estimation.the BOVW feature can be extracted as follows: 1) find the interest points of images using scale-invariant feature transform (SIFT); 2) generate the codebook using those

interest points; and 3) obtain the BOVW features by the histogram of the code words.

Re-ranking

Perform fusion similarity calculation using modal image matrix to find the similarity images.After the fusion similarities between SAR images are obtained, the next step is to rerank the images according to these similarities by a reranking function. In this letter, we introduce a graph-based re-ranking function.

Performance Analysis

After re-ranking process completed next to analysis the performance based on different retrieval methods. Validate that our reranking method is effective to improve the performance of the SAR image retrieval and compared with different re-ranking algorithms.

IV. CONCLUSION

Thus the synthetic aperture radar letter presents a new image re-ranking method for SAR image retrieval, named FSR. First, three SAR-oriented visual features are extracted from the top ranked SAR images within the initial retrieved list to reduce the influence of the speckle noise. The initial relevance scores of them are then estimated under various visual modalities. Second, the fusion similarity is defined in the score space to describe the relationships among SAR images using the constructed modal image matrix. Finally, the SAR images are re-ranked by an existing re-ranking function using the estimated scores and the score space similarities. The encouraging experimental results validate the effectiveness and efficiency of our method. Our proposed algorithm is an example-independent method, which accomplishes the re-ranking task in a blind manner deals with how to add the users' opinions into our method is the future work.

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