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Pattern Formalization Technique for Non-formalized Medicine Images

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Abstract. A big-data analysis infrastructure can use the compare, analysis, and pattern modeling in digital medicine images that generates the medicine and IoT devices. Specially, it is very important to support the objective and exact information that are extracted from the rule based on policy and correlation analysis for more elaborate medicine decision. In this paper, we proposed the image data minimization and high speed analysis technique through the image preprocessing, character extractions, and region processing for medicine image big-data processing based on SIFT arithmetic reduction algorithm. Through this paper, we verified the medicine image formalization technique for variable non-formalized medicine images on OpenCV.

Keywords: medicine image, pattern formalization, medicine big-data analysis

1 Introduction

Medicine big-data techniques are convergence technologies that combine medicine technology and ICT. These days, ICT-medicine markets are new raising blue-ocean and it contributes a more better life and leads to new industry technology. The ultrasonics wave, CT, and MRI are importantly used to diagnosis in medicine areas. It means that the doctor reads the medicine image or video to diagnose or monitor the malady and findings of abnormal evidences or decisions that depend on the knowledge and experience of doctor. Relative to this, the abilities of doctor influence to diagnosis results with some risk and unexpected accuracy.

To minimize some risks and unexpected accuracies in this area, researches and developments in the medicine image pattern modeling and analysis techniques are very important and needed. Therefore, in this paper, we proposed and implemented the formalized pattern modeling techniques through the contour analysis, image enhancement, image noise elimination, image segmentation, and coloring. In this process, we proposed the variable algorithm that is in accordance to image region of input format.

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2 Medicine Image Formalization

2.1 Image Processing and Division

The OpenCV SIFT (Scale Invariant Feature Transform) libraries are used to extract the feature vectors that easily identify the feature of image such as corner points. The SIFT algorithm easily represents the brightness and directions around the feature points and degree of bright variation. So, it is possible to extract the features that use the pattern matching in spite of resizing, variation of the format and direction.

In order to exactly and precisely extract the feature points, we used the histogram equalization, Gaussian filtering, difference of Gaussian, elimination of edge, orient assignment, etc., and enhanced the noise elimination techniques based on SIFT algorithm The image division function extracts the image analysis region that includes feature points. This function enhances the speed of image data analysis and enables the parallel processing of image that guarantees the exactness.

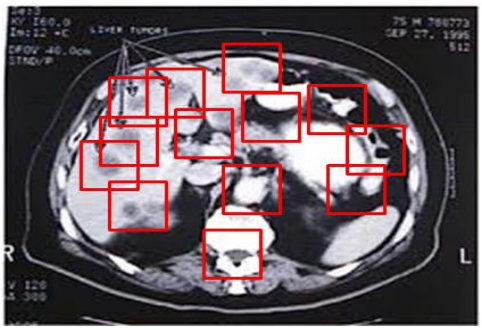

Fig. 1. Image Processing and Division

2.2 Image Feature Extractions

The image pattern matching techniques are used to verify and optimize the results of matching that extract the adaption points from so much information. With these goals, the SURF techniques are adapted to extract many feature points, and the pattern modeling of this feature point should enhance the degree of matching precision.

3 Medicine Image Pattern Formalization Translation System

3.1 Overall System Structure

In this paper, we experimented on the variable image data based on the previous image pattern matching algorithms to enhance the quality. We enhanced the speed and precision of pattern matching using compare and analysis algorithm and matching flow. Considering this goal, we constructed the medicine image pattern formalization translation system as shown in Fig. 2.

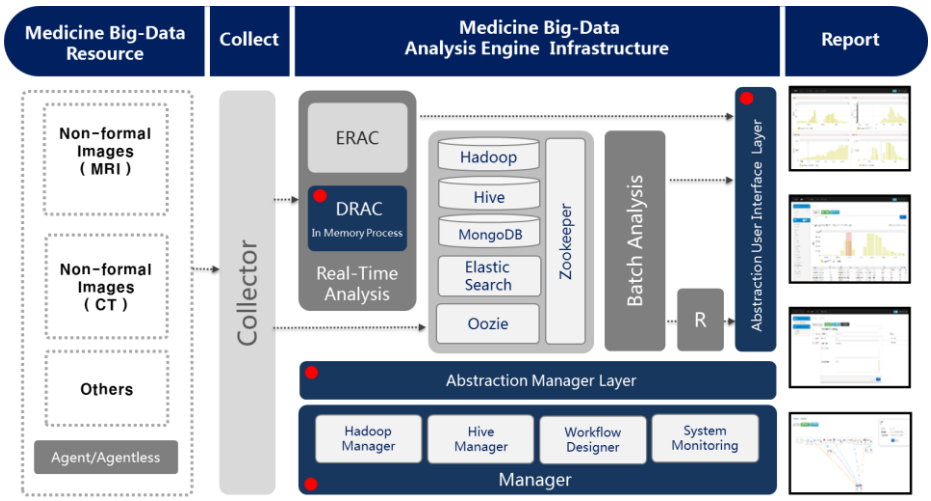

Fig. 2. Medicine Image Pattern Formalization Translation System

3.2 Image Matching and Analysis Core

Specifically, the arguments of vector and scalar enhance the precision and the degree of precision through the vector calculation and auclid distance calculation as indicated in Fig. 3. It can be noted that we enhanced the analysis speed through the variable experiments.

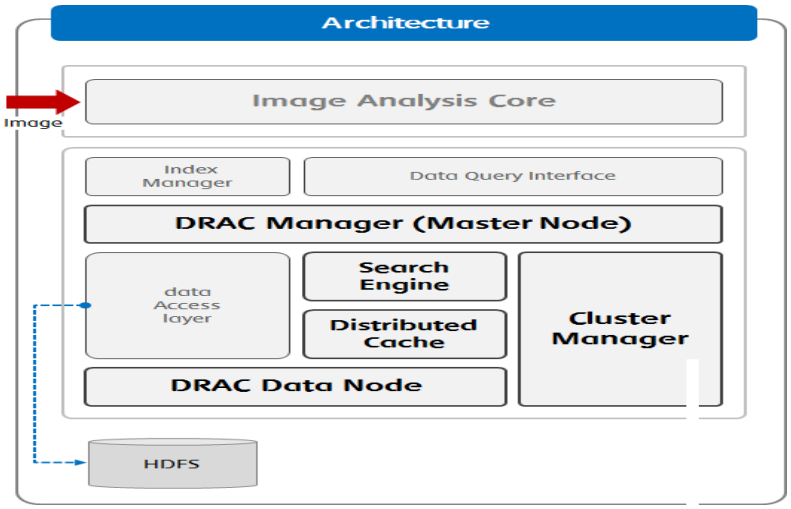

Fig. 3. Medicine Image Pattern Matching and Analysis Core

4 Conclusions

It is very important to support the objective and exact information that are extracted from the rule based policy and correlation analysis for more elaborate medicine decision. In this paper, we proposed the image data minimization and high speed analysis technique through the image preprocessing, character extractions, and region processing for medicine image big-data processing. Through this paper, we verified the medicine image formalization technique for variable non-formalized medicine images on OpenCV and the proposed big-data analysis infrastructure.

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