Thermal Image Processing Approach to Detect Malaria using Fuzzy Logic

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 137
Number 14

Year of Publication: 2016

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10.5120/ijca2016908710

Abstract

The thermal image processing technique for detecting malaria using General Fuzzy Min-Max neural network (GFMM). For detecting malaria, image should go through 4 standard steps, pre-processing, segmentation, feature extraction and selection and classification. Median filter is used in pre-processing step which reduces salt-and-pepper noise of the image. The filtered image is then segmented with the help of Otsu thresholding technique which automatically computes the optimum threshold partitioning the two classes such that spreading is minimal. The features of the segmented part are extracted by Gray Level Co-occurrence Matrix (GLCM), which extracts the infected part of the malaria blood cell. This matrix holds data of gray values of every pixel at its corresponding location. Finally, the GFMM is performed on the extracted data for classification. It performs classification along with clustering, which provides efficient way in recognizing and searching the infected part of the cell.

References
2. C.A. Moxon, G.E. Grau, A.G. Craig 2011 Malaria: modification of the red blood cell and consequences in the human host
3. C.K. Murray, R.A. Gasser Jr., A.J. Magill, R.S. Miller 2008 Update on rapid diagnostic testing for malaria
8. H.W. Hou, A.A.S. Bhagat, A.G.L. Chong, P. Mao, K.S.W. Tan, J. Han, C.T. Lim, 2010 Deformability based cell margination—a simple microfluidic design for malaria-infected erythrocyte separation,
11. L. Gervais, N. de Rooij, E. Delamarche, 2011 Microfluidic chips for point-of-care immunodiagnostics
12. M. Sezgin and B. Sankur 2004 Survey over image thresholding techniques and quantitative performance evaluation
13. Nobuyuki Otsu 1979 A threshold selection method from gray-level histograms
14. Ostu N A. 1979 Threshold Selection Method from Gray-Level Histograms

**Index Terms**

Computer Science Fuzzy Systems
Keywords

Image pre-processing, Median filtering, Segmentation, Otsu Thresholding, Feature extraction, GLCM, Classification, General Fuzzy Min-Max neural network.