

Accepted Manuscript

3D local ternary co-occurrence patterns for natural, texture, face and bio medical image retrieval

Megha Agarwal, Amit Singhal, Brejesh Lall

PII: S0925-2312(18)30763-X
DOI: [10.1016/j.neucom.2018.06.027](https://doi.org/10.1016/j.neucom.2018.06.027)
Reference: NEUCOM 19705

To appear in: *Neurocomputing*

Received date: 21 December 2017
Revised date: 5 June 2018
Accepted date: 11 June 2018

Please cite this article as: Megha Agarwal, Amit Singhal, Brejesh Lall, 3D local ternary co-occurrence patterns for natural, texture, face and bio medical image retrieval, *Neurocomputing* (2018), doi: [10.1016/j.neucom.2018.06.027](https://doi.org/10.1016/j.neucom.2018.06.027)



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

3D local ternary co-occurrence patterns for natural, texture, face and bio medical image retrieval

Megha Agarwal^a, Amit Singhal^{b,*}, Bresh Lall^c

^aDepartment of Electronics and Communication Engineering, Jaypee Institute of Information Technology Noida

^bDepartment of Electronics and Communication Engineering, Bennett University, Greater Noida

^cDepartment of Electrical Engineering, Indian Institute of Technology Delhi

Abstract

In this paper, a novel feature called three dimensional local ternary co-occurrence pattern (3D-LTCoP) is proposed for natural, texture, face and biomedical image retrieval. Standard local binary pattern and its variants like local ternary patterns, local derivative patterns, local tetra patterns etc. encode relationship between reference pixel and neighboring pixels in a two dimensional plane of the image. The edge distribution information in these local patterns are extracted using first-order derivatives and are represented in the form of histogram. Proposed technique of feature representation draws a three dimensional cubical image block in the local region using Gaussian filtered images and extracts relationship between reference pixel and neighboring pixels in five diverse directions of the 3D block. Further, frequency analysis of ternary patterns is performed by storing mutual local directional information in the co-occurrence matrix. Experiments are conducted on six benchmark databases ranging from natural, texture, face to biomedical categories to observe the robustness of the proposed feature. Results are analyzed and compared with typical state-of-the-art local patterns and superiority of the proposed technique is clearly evident in terms of performance evaluation measures.

Keywords: Feature descriptor, Image retrieval, Local ternary pattern, Medical imaging, Texture

1. Introduction

1.1. Motivation

In today's era of digitization, information from various spheres of life, i.e., home, office, shopping malls, hospitals etc. is easily accessible at our fingertips (smart-phones). A vast majority of this information is captured and stored in the form of digital images. Medical images in the form of computed tomography (CT), magnetic resonance imaging (MRI), ultrasound (US), X-ray, etc. have become valuable tools in assisting doctors for patient diagnostic. In the crime investigation of a scene, loads of pictures are taken to keep record of evidences and biometrics. The major challenge with these massive sets of digital media is to identify the relevant images in order to meet the technical requirements. The ability to automatically extract any specific image from this huge database opens the horizons for improving accuracy of detection in less computational time. Moreover, it is very difficult to achieve recurring, reliable and quantifiable image retrieval results by human in a decent time. Hence, there is a dire need of developing expert content based image retrieval (CBIR) systems to utilize visual contents such as color, texture, shape, spatial layout etc. for automatic image indexing [1, 2]. In a CBIR system, an image of user's interest is addressed as a query and is passed as an input to retrieve images relevant to that query image. In the field of medicine, such systems enable young physicians to retrieve similar disease cases from massive dataset of patients. At the

*Corresponding author.

Email address: singhalamit.iitd@gmail.com

Download English Version:

<https://daneshyari.com/en/article/8953590>

Download Persian Version:

<https://daneshyari.com/article/8953590>

[Daneshyari.com](https://daneshyari.com)