

Classification of SD-OCT Volumes with LBP: Application to DME Detection

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9th Oct. 2015

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① Introduction

State-of-the-art

② DME detection

Framework

Image pre-processing

Mapping

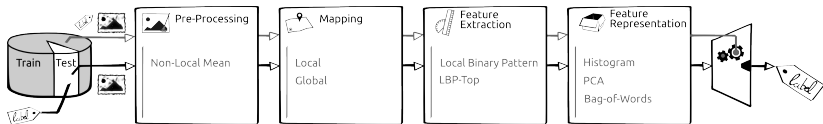
Local Binary Pattern

Feature representation



DME detection Framework

Overview

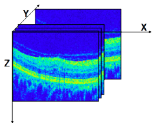




DME detection

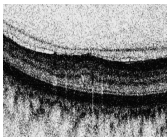
Image pre-processing

Reference system

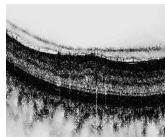


- ▶ OCT images corrupted with speckle noise
- ▶ Denoising for each B-scan ($x - z$ slice)
- ▶ Non-Local Means ¹

Qualitative results



Raw image

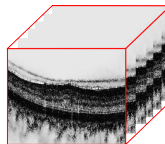
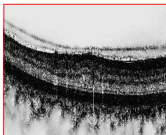


NLM denoising

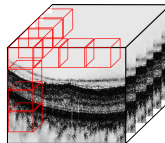
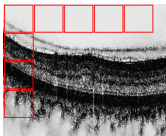


DME Detection Mapping

Global mapping



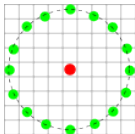
Local mapping





DME Detection Local Binary Pattern

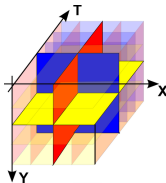
LBP



$$LBP_{P,R} = \sum_{p=0}^{P-1} s(g_p - g_c) 2^p, \quad s(\cdot) = \begin{cases} 1 & \text{if } (g_p - g_c) \geq 0 \\ 0 & \text{otherwise} \end{cases},$$

- Select uniform and rotation invariant

LBP-Three Orthogonal Plane (TOP)





DME Detection Feature representation

Low-level representation

→ Compute the histogram of the LBP codes

Global mapping

LBP Concatenation of histogram per
B-scan

Local mapping

LBP-TOP Concatenation

► 1 LBP histogram per window

► 1 LBP histogram per B-scan

High-level representation

