

Accepted Manuscript

Spectral Shape Classification: A Deep Learning Approach

Majid Masoumi, A. Ben Hamza

PII: S1047-3203(17)30001-9

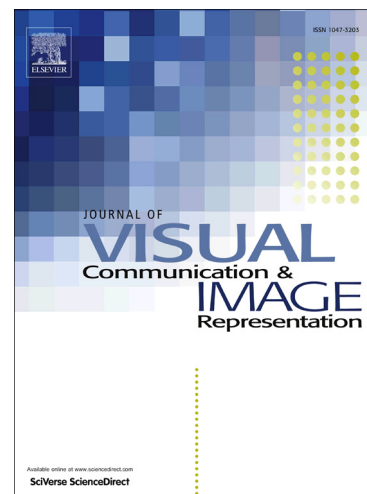
DOI: <http://dx.doi.org/10.1016/j.jvcir.2017.01.001>

Reference: YJVC1 1921

To appear in: *J. Vis. Commun. Image R.*

Received Date: 26 April 2016

Accepted Date: 1 January 2017



Please cite this article as: M. Masoumi, A.B. Hamza, Spectral Shape Classification: A Deep Learning Approach, *J. Vis. Commun. Image R.* (2017), doi: <http://dx.doi.org/10.1016/j.jvcir.2017.01.001>

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.

Spectral Shape Classification: A Deep Learning Approach

Majid Masoumi and A. Ben Hamza

Concordia Institute for Information Systems Engineering

Concordia University, Montreal, QC, Canada

Phone/fax: (514) 848-2424 #5383 / (514) 848-3171

E-mail: hamza@ciise.concordia.ca

Abstract

In this paper, we propose a deep learning approach to 3D shape classification using spectral graph wavelets and the bag-of-features paradigm. In order to capture both the local and global geometry of a 3D shape, we present a three-step feature description strategy. Local descriptors are first extracted via the spectral graph wavelet transform having the Mexican hat wavelet as a generating kernel. Then, mid-level features are obtained by embedding local descriptors into the visual vocabulary space using the soft-assignment coding step of the bag-of-features model. A global descriptor is subsequently constructed by aggregating mid-level features weighted by a geodesic exponential kernel, resulting in a matrix representation that describes the frequency of appearance of nearby codewords in the vocabulary. Experimental results on two standard 3D shape benchmarks demonstrate the much better performance of the proposed approach in comparison with state-of-the-art methods.

Keywords: Deep learning; spectral graph wavelet; bag-of-features; classification.

Download English Version:

<https://daneshyari.com/en/article/4969466>

Download Persian Version:

<https://daneshyari.com/article/4969466>

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