Author's Accepted Manuscript

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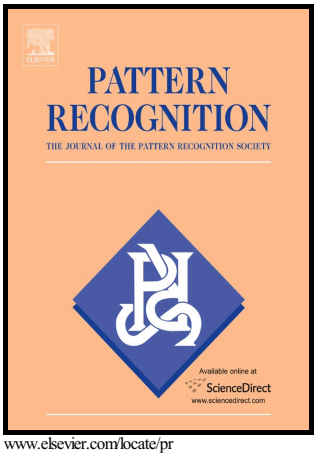

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PII: S0031-3203(16)30294-1
DOI: http://dx.doi.org/10.1016/j.patcog.2016.09.027
Reference: PR5889

To appear in: *Pattern Recognition*

Received date: 31 January 2016
Revised date: 20 June 2016
Accepted date: 21 September 2016

Cite this article as: Tao Xu, Han Zhang, Cheng Xin, Edward Kim, L. Rodney Long, Zhiyun Xue, Sameer Antani and Xiaolei Huang, Multi-feature based Benchmark for Cervical Dysplasia Classification Evaluation, *Pattern Recognition,* http://dx.doi.org/10.1016/j.patcog.2016.09.027

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ACCEPTED MANUSCRIPT

Multi-feature based Benchmark for Cervical Dysplasia Classification Evaluation

Tao Xu[a], Han Zhang[b], Cheng Xin[a], Edward Kim[c], L. Rodney Long[d], Zhiyun Xue[d], Sameer Antani[d], Xiaolei Huang[a,*]

[a] *Computer Science and Engineering Department, Lehigh University, Bethlehem, PA, USA*
[b] *Department of Computer Science, Rutgers University, Piscataway, NJ, USA*
[c] *Computing Sciences Department, Villanova University, Villanova, PA, USA*
[d] *National Library of Medicine, National Institutes of Health, Bethesda, MD, USA*

Abstract

Cervical cancer is one of the most common types of cancer in women worldwide. Most deaths due to the disease occur in less developed areas of the world. In this work, we introduce a new image dataset along with expert annotated diagnoses for evaluating image-based cervical disease classification algorithms. A large number of Cervigram® images are selected from a database provided by the US National Cancer Institute. For each image, we extract three complementary pyramid features: Pyramid histogram in L*A*B* color space (PLAB), Pyramid Histogram of Oriented Gradients (PHOG), and Pyramid histogram of Local Binary Patterns (PLBP). Other than hand-crafted pyramid features, we investigate the performance of convolutional neural network (CNN) features for cervical disease classification. Our experimental results demonstrate the effectiveness of both our hand-crafted and our deep features. We intend to release this multi-feature dataset and our extensive evaluations using seven classic classifiers can serve as the baseline.

Keywords: Cervical cancer screening; computer aided diagnosis; image classification; pyramid histogram; local binary patterns; convolutional neural network.

*Corresponding author. Tel.:+1 (610) 758-4818; Fax: +1 (610) 758-4096
Email address: xih206@lehigh.edu (Xiaolei Huang)

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