

Semi-automated lesion grading in cervix images with Specular Reflection removal

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Abstract

Colposcopy is the method for cervical cancer detection at early stage which is examined by colposcopist based on the changes in the color of cervix tissues. When gynecological exam is done, over the uterine cervix surface 3 % acetic acid is applied for two minutes, the method is known as visual inspection with the application of acetic acid (VIA), which causes whitening of precancerous tissues known as malignant regions of the epithelium; these regions of tissue are called acetowhite lesions (AW). During the treatment of cervical cancer colposcopic image is obtained with a specialized camera outfitted with a colposcope with green filters. Due to illumination of light on cervix tissue image preprocessing is required prior to applying AW lesions detection algorithms on colposcopic images to remove Specular Reflections (SR) and to differentiate the cervix region-of-interest (ROI) from other image regions which are not relevant to the analysis. In this work by preprocessing SRs are identified and then SRs are removed. After preprocessing to identify the malignant regions a texture segmentation is used by applying k-means clustering for automatic separation of non-cancerous and precancerous regions of cervix tissue. This algorithm would help the gynecologist during the treatment of cervical

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2011 · [Digital Image Processing](#)
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Detection of abnormal regions of precancerous lesions in digitised uterine Cervix images#1 [Abhishek Das](#) (Central University, India) H-Index: 8#2 [Avijit Kar](#) (Jadavpur University) H-Index: 8Last. [Debasis Bhattacharyya](#) H-Index: 5[view all 3 authors...](#)

Invasive uterine cervical cancer is a prevalent cause of cancer-related mortality and morbidity among women in the developing world. In this paper, a survey of current image segmentation methods and their possible applications to identify Cervical Intraepithelial Neoplasia (CIN) are discussed. Approaches to Cervix image segmentation and analysis are discussed. A very efficient algorithm for segmentation of abnormal regions of cancerous cervical lesions is developed, verified and compared with ot... [more](#)

7 Citations

[Source](#)[Cite](#)[Save](#)**Automated image analysis of uterine cervical images**#1 [Wenjing Li](#) H-Index: 5#2 [Jia Gu](#) H-Index: 3Last. [Allen Poirson](#) H-Index: 1[view all 4 authors...](#)

Cervical Cancer is the second most common cancer among women worldwide and the leading cause of cancer mortality of women in developing countries. If detected early and treated adequately, cervical cancer can be virtually prevented. Cervical precursor lesions and invasive cancer exhibit certain morphologic features that can be identified during a visual inspection exam. Digital imaging technologies allow us to assist the physician with a Computer-Aided Diagnosis (CAD) system. In colposcopy, epit... [more](#)

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Content analysis of uterine cervix images: initial steps towards content based indexing and retrieval of cervigrams

#1 [Shiri Gordon](#) (TAU: Tel Aviv University) H-Index: 10
#2 [G. Zimmerman](#) (TAU: Tel Aviv University) H-Index: 5
Last. [Hayit Greenspan](#) (TAU: Tel Aviv University) H-Index: 54
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This work is motivated by the need for visual information extraction and management in the growing field of medical image archives. In particular the work focuses on a unique medical repository of digital cervicographic images ("Cervigrams") collected by the National Cancer Institute (NCI) in a longitudinal multi-year study carried out in Guanacaste, Costa Rica. NCI together with the National Library of Medicine (NLM) is developing a unique Web-based database of the digitized cervix images to st... [more](#)

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Digital tools for collecting data from cervigrams for research and training in colposcopy.

[Jan 1, 2006](#) · [Journal of Lower Genital Tract Disease](#) [1.93](#)
#1 [Jose Jeronimo](#) H-Index: 45
#2 [L. Rodney Long](#) H-Index: 24
Last. [Mark Schiffman](#) H-Index: 115
[view all 6 authors...](#)

j Abstract: Colposcopy is a critical part of gynecologic practice but has documented deficiencies, including lack of correlation between the colposcopic appearance and the severity of underlying neoplasia, limited reproducibility, and difficulty in the optimal placement of colposcopically directed biopsies. In a collaborative effort to improve colposcopy, we are analyzing digitized cervigram images from National Cancer Institute-funded studies. Specifically, the National Cancer Institute has coll... [more](#)

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Automatic glare removal in reflectance imagery of the uterine cervix

#1 [Holger Lange](#) H-Index: 1

Colposcopy is a diagnostic method used to detect cancer precursors and cancer of the uterine cervix. Computer-

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#2 [Dana Hernes](#) (TTU: Texas Tech University) **H-Index: 1**

Last. [Daron Ferris](#) (GRU: Augusta University) **H-Index: 2**

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Automated segmentation and classification of diagnostic markers in medical imagery are challenging tasks. Numerous algorithms for segmentation and classification based on statistical approaches of varying complexity are found in the literature. However, the design of an efficient and automated algorithm for precise classification of desired diagnostic markers is extremely image-specific. The National Library of Medicine (NLM), in collaboration with the National Cancer Institute (NCI), is creatin... [more](#)

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Image segmentation of uterine cervix images for indexing in PACS

#1 [Shiri Gordon](#) (TAU: Tel Aviv University) **H-Index: 10**

#2 [G. Zimmerman](#) (TAU: Tel Aviv University) **H-Index: 5**

Last. [Hayit Greenspan](#) (TAU: Tel Aviv University) **H-Index: 54**

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The National Cancer Institute has collected a large database of digitized 35 mm slides of the uterine cervix, the idea being to build a system enabling to study the evolution of lesions related to cervical cancer. In taking the first few steps towards this goal, the objective of this work is to develop and evaluate methodologies required for visual-based (i.e. content-based) indexing and retrieval that substantially improve information management of such a database. In this paper we model the pr... [more](#)



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Design and methods of a population-based natural history study of cervical neoplasia in a rural province of Costa Rica: the Guanacaste Project

 **May 1, 1997** · [Revista Panamericana De Salud Publica-pan American Journal of Public Health](#)
 **1.47**

#1 [Rolando Herrero](#) **H-Index: 114**

#2 [Mark Schiffman](#) **H-Index: 115**

Last. [Louise A. Brinton](#) **H-Index: 140**

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This paper reports on the enrollment phase of a population-based natural history study of cervical neoplasia in Guanacaste, a rural province of Costa Rica with consistently high rates of invasive cervical cancer. The main goals of the study are to investigate the role of human papillomavirus (HPV) infection and its co-factors in the etiology of

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In this paper, we present an approach to color image understanding that accounts for color variations due to highlights and shading. We demonstrate that the reflected light from every point on a dielectric object, such as plastic, can be described as a linear combination of the object color and the highlight color. The colors of all light rays reflected from one object then form a planar cluster in the color space. The shape of this cluster is determined by the object and highlight colors and by... [more](#)

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HLDnet: Novel deep learning based Artificial Intelligence tool fuses acetic acid and Lugol's iodine cervicograms for accurate pre-cancer screeningJan 1, 2022 · [Biomedical Signal Processing and Control](#) [3.88](#)#1 [Ling Yan](#) (ZJU: Zhejiang University)#2 [Haoxuan Song](#) (HDU: Hangzhou Dianzi University)Last: [Xingfa Shen](#) (HDU: Hangzhou Dianzi University) **H-Index: 11**[view all 8 authors...](#)

Abstract null null Cervical cancer is one of the major causes of women's death and infertility around the world, especially in developing and underdeveloped countries. Early screening for high-grade squamous intraepithelial

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#1 Xiaoxia Wang (Huaqiao University) H-Index: 1
#2 Ping Li H-Index: 26
Last. Peizhong Liu (Huaqiao University) H-Index: 8
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Objective. To explore an inpainting method that can balance texture details and visual observability to eliminate the specular reflection (SR) regions in the colposcopic image, thus improving the accuracy of clinical diagnosis for cervical cancer. Methods. (1) To ensure smoothness, Gaussian Blur and filling methods are applied to the global image. (2) Striving to preserve the anatomical texture details of the colposcopic image as much as possible, the exemplar-based method is applied to local bl... [more](#)

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Detection of cervical lesion region from colposcopic images based on feature reselection

Mar 1, 2020 · [Biomedical Signal Processing and Control](#) [3.88](#)
#1 Bing Bai (Huaqiao University) H-Index: 2
#2 Yongzhao Du (Huaqiao University) H-Index: 11
Last. Yuchun Lv (FJMU: Fujian Medical University) H-Index: 4
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Abstract Colposcopy is one of the important steps in the clinical screening of cervical intraepithelial neoplasia (CIN) and early cervical cancer. It directly affects the patient's diagnosis and treatment program. Therefore, it is widely used for cervical cancer screening. The present work proposes a cervical lesion detection net (CLDNet) model based on the deep convolutional neural network (CNN). The Squeeze-Excitation convolutional neural network (SE-CNN) employed to extract depth features of ... [more](#)

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Automatic segmentation of cervical region in colposcopic images using K-means

Sep 13, 2018 · [Australasian Physical & Engineering Sciences in Medicine](#) [1.43](#)
#1 Bing Bai (Huaqiao University) H-Index: 2
#2 Peizhong Liu (Huaqiao University) H-Index: 8
Last. Yan-Ming Luo (Huaqiao University) H-Index: 2
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Colposcopy is an important imaging modality for the detection of cervical lesions. The analysis of colposcopic images, especially the effective segmentation of the cervical region, has important clinical value in clinical application. A cervical segmentation method based on the HSV color mode is proposed, which can divide and extract the cervical region in the medical and anatomical sense. Firstly, the histogram threshold method is used to analyze

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