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### **RESEARCH ARTICLE**

# Segmentation of Nuclei in Cytological Images of Breast FNAC Sample: Case Study

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**Abstract—** *Demand for increased robustness, better reliability and high automation of image segmentation algorithms is apparent in recent years. Precise diagnosis and prognosis is essential to reduce the high death rate. In this paper, the study of different methodologies of cytological image segmentation is proposed. The study includes the watershed algorithm and active contouring. One can also find here a description of de-noising and contrast enhancement techniques; because the raw image taken from camera mounted on microscope contain less information and noise. The study covers the different pre-segmentation processes, like Circular Hough Transform (CHT) for circle detection and nucleus localization method. Until now many segmentation algorithms were introduced but unfortunately those cannot be used directly for purpose of nuclei segmentation. From past few years' large efforts are taken to develop a fully automatic segmentation algorithm. Here, a group of modified versions of cytological image segmentation method adopted for fine needle biopsy images are presented. The discussion on common errors and possible future problems is also added.*

**Keywords:** *CHT; Watershed; Active Contouring*

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