

## Development of an Interactive and Robust Image Analysis and Diagnostic Tool in R for Early Detection of Cervical Cancer

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**Abstract :** Cervical cancer is one of the most common cancer among women worldwide which can be cured if detected early. Manual pathology which is typically utilized at present has many limitations. The current gold standard for cervical cancer diagnosis is exhaustive and time-consuming because it relies heavily on the subjective knowledge of the oncopathologists which leads to mis-diagnosis and missed diagnosis resulting false negative and false positive. To reduce time and complexities associated with early diagnosis, we require an interactive diagnostic tool for early detection particularly in developing countries where cervical cancer incidence and related mortality is high. Incorporation of digital pathology in place of manual pathology for cervical cancer screening and diagnosis can increase the precision and strongly reduce the chances of error in a time-specific manner. Thus, we propose a robust and interactive cervical cancer image analysis and diagnostic tool, which can categorically process both histopathological and cytopathological images to identify abnormal cells in the least amount of time and settings with minimum resources. Furthermore, incorporation of a set of specific parameters that are typically referred to for identification of abnormal cells with the help of open source software - 'R' is one of the major highlights of the tool. The software has the ability to automatically identify and quantify the morphological features, color intensity, sensitivity and other parameters digitally to differentiate abnormal from normal cells, which may improve and accelerate screening and early diagnosis, ultimately leading to timely treatment of cervical cancer.

**Keywords :** cervical cancer, early detection, digital Pathology, screening

**Conference Title :** ICPH 2018 : International Conference on Public Health

**Conference Location :** London, United Kingdom

**Conference Dates :** May 14-15, 2018