PapScanner: an automated system to detect cervical dysplasia

Applications

- The present invention PapScanner is a fully automated cervical cancer screening system using deep learning based visual evaluation algorithm.
- The algorithm can be also be used for both conventional and liquid based cervical cancer detection methods.
- This would enable automated, expert-level diagnosis of early cervical dysplasia dissemination with an effective point-of-care.

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Categories of this invention

- Medical Devices (Diagnostics)
- Computer Science and IT (Artificial Intelligence)
- Lifesciences (Clinical Applications - Oncology)
- Medical Imaging

Problem Addressed

Cervical Cancer is the second most common cancer among women worldwide. Human papillomavirus (HPV) vaccination and cervical screening are lacking in most lower resource settings, where approximately 80% of cancer cases occur annually. Visual inspection of the cervix following acetic acid application is practical but not reproducible or accurate.

PapScanner provides a solution as follows

- ✓ Automated accurate screening.
- ✓ Observer bias is reduced.
- ✓ It quantifies the features which may be interpreted by doctors in visual terms which are subjective to the concerned pathologist.
- ✓ Used as a mass screening tool and timely reports.

Technology

- This invention pertains to an AI generated algorithm which uses a deep learning based novel binary classification system to classify Pap smear slide images as normal and abnormal.
- Further, a multiclass classification will classify the Pap smear slide images as NILM, ASCUS, LSIL, HSIL and SCC, which will reflect the degree of cervical dysplasia.
- The algorithm will predict the Pap smear slides when it has a confidence level of more than 90% so reducing the occurrence of false-negative and false positive.
- In addition, a web based application of PapScanner uses GUI which allows users to interact with the system with ease.

Advantages

- Automated, fast and user friendly.
- No high-end infrastructure required.
- Reduces the workload of the pathologist by assisting in taking better decision.
- Cost effective screening tool
- Easy access from remote locations.

Potential Value

1 The potential market size of cervical cancer is expected to increase significantly during 2017-2030.

2 The market value of cervical cancer treatment is over USD 7.9 billion by 2027 end with a CAGR of over 5.8% during 2020 to 2027.

3 Cervical Cancer screening market revenue is anticipated to rise at a considerable rate due to the prevalence of HPV.

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