

Cervix Image Classification for Prognosis of Cervical Cancer using Deep Neural Network with Transfer Learning

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Abstract

INTRODUCTION: Cervical cancer is the leading cancer among the other female cancers. It develops in the cervix of women. It takes decades in development thus can be preventable if diagnosed at an early stage. The cervix is classified into three types Type I/II/III. The efficacy of the treatment depends on the diagnosis of the right type of cervix. There is a thin line difference between the three types. Thus, identification of the right type of cervix becomes a difficult task for the health care providers too. To aid this problem, we proposed an algorithm based on the standard transfer learning approach used for building a model that classifies cervix images.

OBJECTIVES: The objective of this study is to develop a cervical cancer predictive model based on deep learning and transfer learning techniques that will recognize and classify the cervix images into one of the classes (Type 1/Type2/Type3).

METHODS: Techniques used for carrying out the experimental work includes deep learning and Transfer Learning. The three pertained models namely InceptionV3, ResNet50, and VGG19 are used for creating ConvNet that will classify the cervix images.

RESULTS: The result of the experiment reveals that the Inception v3 model is performing better than Vgg19 and ResNet50 with an accuracy of 96.1% on the cervical cancer dataset.

CONCLUSION: In the future, augmentation techniques can be employed to achieve better accuracy.

Keywords: Pervasive healthcare, Cancer, Cervical Cancer, Artificial Intelligence, Deep Learning, Convolutional Neural Network, Inception V3, ResNet50, VGG19, Saliency Map.

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1. Introduction

Cervical cancer is the cancer of the cervix. The cervix is part of a women's womb. It ranked as the fourth most common cancer among other female cancers. The cancer

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