عنوان مقاله:

Breast Cancer Classification through Meta-Learning Ensemble Model based on Deep Neural Networks

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خلاصه مقاله:

Predicting the development of cancer has always been a serious challenge for scientists and medical professionals. The prompt identification and prognosis of a disease is greatly aided by early-stage detection. Researchers have proposed a number of different strategies for early cancer detection. The purpose of this research is to use meta-learning techniques and several different kinds of convolutional-neural-networks(CNN) to create a model that can accurately and quickly categorize breast cancer(BC). There are many different kinds of breast lesions represented in the Breast Ultrasound Images (BUSI) dataset. It is essential for the early diagnosis and treatment of BC to determine if these tumors are benign or malignant. Several cutting-edge methods were included in this study to create the proposed model. These methods included meta-learning ensemble methodology, transfer-learning, and data-augmentation. With the help of meta-learning, the model will be able to swiftly learn from novel data sets. The feature extraction capability of the model can be improved with the help of pre-trained models through a process called transfer learning. In order to have a larger and more varied dataset, we will use data augmentation techniques to produce new training images. The classification accuracy of the model can be enhanced by using meta-ensemble learning techniques to aggregate the results of several CNNs. Ensemble-learning(EL) will be utilized to aggregate the results of various CNN, and a meta-learning strategy will be applied to optimize the learning process. The evaluation results further demonstrate the model's efficacy and precision. Finally, the suggested model's accuracy, precision, recall, and F1-score will be contrasted to those of conventional methods and other current systems.

کلمات کلیدی:
Deep-Learning, Meta-Learning, EL, CNN, Breast-Cancer, Classification

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