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| Title | Strategies for enhancing the multi-stage classification performances of her2 breast cancer from hematoxylin and eosin images | | |
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| Abstract |  |
| Breast cancer is a significant health concern among women. Prompt diagnosis can diminish the mortality rate and direct patients to take steps for cancer treatment. Recently, deep learning has been employed to diagnose breast cancer in the context of digital pathology. To help in this area, a transfer learning-based model called ‘HE-HER2Net’ has been proposed to diagnose multiple stages of HER2 breast cancer (HER2-0, HER2-1+, HER2-2+, HER2-3+) on H&E (hematoxylin & eosin) images from the BCI dataset. HE-HER2Net is the modified version of the Xception model, which is additionally comprised of global average pooling, several batch normalization layers, dropout layers, and dense layers with a swish activation function. This proposed model exceeds all existing models in terms of accuracy (0.87), precision (0.88), recall (0.86), and AUC score (0.98) immensely. In addition, our proposed model has been explained through a class-discriminative localization technique using Grad-CAM to build trust and to make the model more transparent. Finally, nuclei segmentation has been performed through the StarDist method. | |