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Developing an Accurate AI Algorithm for Histopathologic Cancer Detection

Authors : Leah Ning

Abstract : This paper discusses the development of a machine learning algorithm that accurately detects metastatic breast cancer (cancer has spread elsewhere from its origin part) in selected images that come from pathology scans of lymph node sections. Being able to develop an accurate artificial intelligence (AI) algorithm would help significantly in breast cancer diagnosis since manual examination of lymph node scans is both tedious and oftentimes highly subjective. The usage of AI in the diagnosis process provides a much more straightforward, reliable, and efficient method for medical professionals and would enable faster diagnosis and, therefore, more immediate treatment. The overall approach used was to train a convolution neural network (CNN) based on a set of pathology scan data and use the trained model to binarily classify if a new scan were benign or malignant, outputting a 0 or a 1, respectively. The final model's prediction accuracy is very high, with 100% for the train set and over 70% for the test set. Being able to have such high accuracy using an AI model is monumental in regard to medical pathology and cancer detection. Having AI as a new tool capable of quick detection will significantly help medical professionals and patients suffering from cancer.

Keywords : breast cancer detection, AI, machine learning, algorithm
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