

عنوان مقاله:

Mitosis Detection in Breast Cancer Histological Images Based On Texture Features Using AdaBoost

محل انتشار:

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خلاصه مقاله:

Counting mitotic figures present in tissue samples from a patient with cancer, plays a crucial role in assessing the patient's survival chances. In clinical practice, mitotic cells are counted manually by pathologists in order to grade the proliferative activity of breast tumors. However, detecting mitoses under a microscope is a labourious, time-consuming task which can benefit from computer aided diagnosis. In this research we aim to detect mitotic cells present in breast cancer tissue, using only texture and pattern features. To classify cells into mitotic and non-mitotic classes, we use an AdaBoost classifier, an ensemble learning method which uses other (weak) classifiers to construct a strong classifier. 11 different classifiers were used separately as base learners, and their classification performance was recorded. The proposed ensemble classifier is tested on the standard MITOS-ATYPIA-14 dataset, where a 64x64 pixel window around each cells center was extracted to be used as training data. It was observed that an AdaBoost that used Logistic Regression as its base learner achieved a F1 Score of 0.85 using only texture features as input which shows a significant performance improvement over status quo. It is also observed that Decision Trees provides the best recall among base classifiers and Random Forest has the best Precision.

کلمات کلیدی:

Breast cancer grading; Mitosis detection; Computer Aided Diagnosis; Texture Features; Ensemble learning; Pathology

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