

Classification of gram-positive and gram-negative bacterial images based on machine learning algorithm

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ABSTRACT

Bacteria are small living things that cannot be seen directly, and bacteria are the main cause of various diseases, so a tool is needed that can detect them. In fact, the manual classification process necessitates a significant amount of time. In addition, the traditional diagnosis has a limitation on accurate detection. Identifying and classifying bacteria is critical for assisting the medical field. Therefore, this study aims to utilize the machine learning approach's computerized technique proposed. The method provided features extraction and classification. This research used gram-positive and gram-negative bacterial species. Two texture features are used to extract characteristics of each bacterial class: the histogram feature and the Gray Level Co-occurrence Matrix (GLCM). In addition, the Naive Bayes classifier was utilized to classify the features extracted. The final classification accuracy result is 77.5% using the histogram feature and 72% using GLCM features. Therefore, this approach might be possible to assist the clinician and microbiologist.

KEYWORDS

Bacterial; GLCM feature; Histogram feature; Machine learning; Naive Bayes

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