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Title	Analysis of GLRLM Texture Features Derived From Computed Tomography Scans For COVID-19 Diagnosis
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Abstract

Since its discovery in late 2019, COVID-19 has become a major worldwide concern due to its incredibly high degree of contagion, and early diagnosis is crucial to limit this global progression. Computed Tomography (CT) scans of the chest offer a low-cost alternative diagnosis modality to the standard reverse polymerase chain reaction (RT-PCR) test for COVID-19. In this paper, we analyze texture features extracted from chest CT scans using Gray Level Run Length Matrix (GLRLM) techniques for their ability to distinguish between COVID-19 and non-COVID-19 patients. Quantitative texture analysis of CT scans provides a measure of the biological heterogeneity in tissue microenvironment which can be useful in the diagnosis of a wide range of diseases, and we hypothesize that GLRLM texture features may hold significance for diagnosis of COVID-19. 13 GLRLM features were extracted from CT scans of 349 positive COVID-19 cases and 397 negative COVID-19 cases. Holdout validation was used to randomly split 70% of the images for training, and the remaining 30% for testing. A GentleBoost classifier was used to evaluate performance. A significant AUROC of 0.92 along with a high classification accuracy of 85.7% was obtained on the independent test set, indicating that GLRLM texture features extracted from chest CT scans have the potential to be a significant tool in the rapid and accurate diagnosis of COVID-19.