Research on Intelligent Diagnosis Model of Gastrointestinal Diseases Based on Tongue Images

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Abstract. In recent years, along with the improvement of people's living standard, change of lifestyle and aging of population, the incidence of gastrointestinal diseases in China is increasing year by year, and the number of people suffering from gastrointestinal malignant tumors is gradually increasing. Therefore, the importance of early diagnosis of gastrointestinal diseases and early warning of cancer is highlighted. Traditional endoscopic and histopathological examinations have limitations in early diagnosis and screening of gastrointestinal diseases. Tongue diagnosis in traditional Chinese medicine can be a beneficial supplement to disease screening and diagnosis due to its non-invasive nature. Tongue diagnosis is an important part of "observation and diagnosis" in traditional Chinese medicine, which diagnoses diseases by observing the changes of the tongue. Tongue images can reflect the health status of the gastrointestinal tract, providing a new way for non-invasive auxiliary diagnosis of gastrointestinal diseases. Using artificial intelligence related technologies to achieve auxiliary diagnosis as well as non-invasive primary screening of diseases has become a current research hotspot. Based on artificial intelligence and computer image processing technology, the quantification and intelligence of tongue diagnosis can be achieved, which has high clinical application value for non-invasive auxiliary diagnosis of gastrointestinal diseases. It is an important driving force for the integration of Chinese and Western medicine and the modernization of tongue diagnosis in traditional Chinese medicine. The experimental results show that the fusion classification model can fully extract and fit the features of tongue images, which is an improvement and optimization of the traditional machine learning classification model. The deep learning model can effectively improve the diagnostic accuracy of gastrointestinal diseases and visually explain the diagnostic results by using attention mechanisms. The intelligent diagnosis model of gastroenterological diseases based on tongue images constructed in this paper has good classification accuracy and interpretability, and can provide assistance and guidance for clinical diagnosis and treatment.