# Abstract

Nowadays, with the development of our country’s economy, people’ lives have ecountered a great change. The fast-paced life has led to the high incidence of cardiovascular diseases, which is becoming a big treat to our health. Myocardial ischemia is a kind of such diseases that can lead to hypoxia of myocardial cell and further to myocardial infarction. In clinical, ECG is the frequently-used method to diagnose the myocardial ischemia. However, the accuracy of this method depends on the clinical experience, which is result in lacking of efficiency. With the advances of computer technology, it trends to make use of the computer technology in the aided diagnosis of myocardial ischemia.

The deterministic learning theory can build a dynamics model to the ST-T segment of the standard 12-lead ECG, which is able to generate the Cardiodynamicsgram (CDG) after training. It is an obvious difference from the CDG of heathy people and patients. As a result, CDG is able to become the diagnosis method of myocardial ischemia. In recent years, more and more data is obtained from the ECG instrument. In the face of such a massive data, the existing stand-alone program lacks of compute power to finish the task. The Hadoop-based diagnosis system solves the large-scale data processing problem, however, the system is not suitable for the real-time data processing and lacks of the ability of data management.

Regarding the issue mentioned above, this paper implements a myocardial ischemia early diagnosis platform based on Storm using the popular big data processing and cloud computing technology. The platform utilizes B/S structure that is divided into four layer, respectively computation layer, storage layer, business layer and presentation layer. The computation layer implements the deterministic-learning-based myocardial ischemia diagnosis algorithm. Thanks to the advantage of Storm cluster in real-time processing field, the computation layer provides real-time and reliable computation services to the users. Besides, the storage layer provides reliable persistent storage for the ECG data. The business layer is the hub of the platform, implementing a majority of system service logic. The presentation layer integrates a simple and beautiful interface for users. Through a web browser, medical personnel can use various functionalities of the platform in order to diagnose myocardial ischemia and manage patient information, which achieves a significant improvement of work efficiency.

**Keywords:** Myocardial ischemia; Deterministic learning; ECG; Diagnosis platform; Storm