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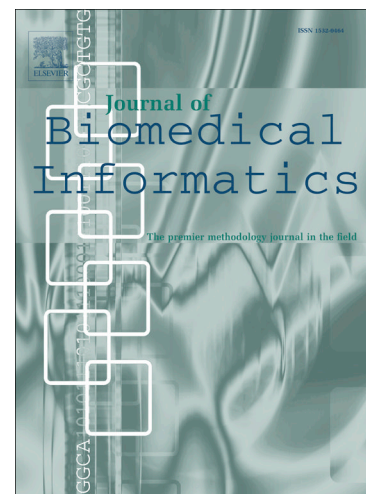
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Big data handling mechanisms in the healthcare applications: A comprehensive and systematic literature review

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Abstract

Healthcare provides many services such as diagnosing, treatment, prevention of diseases, illnesses, injuries, and other physical and mental disorders. Large-scale distributed data processing applications in healthcare as a basic concept operates on large amounts of data. Therefore, big data application functions are the main part of healthcare operations, but there was not any comprehensive and systematic survey about studying and evaluating the important techniques in this field. Therefore, this paper aims at providing the comprehensive, detailed, and systematic study of the state-of-the-art mechanisms in the big data related to healthcare applications in five categories, including machine learning, cloud-based, heuristic-based, agent-based, and hybrid mechanisms. Also, this paper displayed a systematic literature review (SLR) of the big data applications in the healthcare literature up to the end of 2016. Initially, 205 papers were identified, but a paper selection process reduced the number of papers to 29 important studies.

Keywords: Systematic literature review, big data, healthcare, cloud, agent, heuristic.

1. Introduction

There was a great progress in medical information enabled by the rapid growth of information technologies (Seyyedrazzagi & Navimipour, 2017). Therefore, healthcare has gained a great attention in recent years (Tsung-Han, Cheng-Yuan, & Man-Nung, 2016). A large amount of data causes the increased volume compared to the computing resources (Avita Katal, 2013). The big data refers to huge and compound datasets that are beyond the abilities of old data management systems to store, manage, and process them in a timely and economical way (Nmbiar, Sethi, Bhardwaj, & Vargheese, 2013; Sakr & Elgammal, 2016b). Also, the healthcare is one of the world's largest and fastest growing industries (Nmbiar et al., 2013). In health sciences, big data in many fields such as recommendation system, sensor-

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