

OPPORTUNITIES AND CHALLENGES IN THE HEALTHCARE AND MEDICAL BIG DATA ANALYTICS

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Abstract

In the era of big data, a huge volume of heterogeneous healthcare, biological and medical data are generated on a daily basis. These heterogeneous data stored in diverse data formats have to be integrated and stored in a standard way and format in order to perform suitable efficient and effective data analysis and visualization. These data, which are generated from different sources such as mobile devices, sensors, labs tests, clinical notes, social media, demographics data, diverse omics data etc., can be structured, semi-structured or unstructured. These varieties of data structures require these big data to be stored not only in the standard relational databases, but also in NoSQL databases. To provide effective data analysis, a proper classification and standardization of big data in medicine and healthcare are necessary, as well as excellent design and implementation of healthcare information systems. Regarding security and privacy of patient’s data, employing of suitable data governance policies is proposed. Additionally, more efforts should be made towards choosing of proper software development frameworks, tools, databases, in-database analytics, stream computing and data mining algorithms (supervised, unsupervised and semi-supervised) to reveal valuable knowledge and insights from these healthcare and medical big data.

Keywords: Big Data, Medical and Healthcare Big Data, Big Data Analytics, Databases, Healthcare Information Systems.