

LITERATURE SURVEY

ANALYTICS FOR HOSPITALS' HEALTH-CARE DATA

TEAM ID: PNT2022TMID39833

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CASE STUDY I

TITLE : A Review of Analytics and Clinical Informatics in Health Care

AUTHOR : Allan F Simpao, Luis M Ahumada, Jorge A Gálvez, Mohamed A Rehman

YEAR: 2014/4

ABSTRACT:

Federal investment in health information technology has incentivized the adoption of electronic health record systems by physicians and health care organizations; the result has been a massive rise in the collection of patient data in electronic form (i.e. “Big Data”). Health care systems have leveraged Big Data for quality and performance improvements using analytics—the systematic use of data combined with quantitative as well as qualitative analysis to make decisions. Analytics have been utilized in various aspects of health care including predictive risk assessment, clinical decision support, home health monitoring, finance, and resource allocation. Visual analytics is one example of an analytics technique with an array of health care and research applications that are well described in the literature. The proliferation of Big Data and analytics in health care has spawned a growing demand for clinical informatics professionals who can bridge the gap between the medical and information sciences.

CASE STUDY II

TITLE : Analysis of Research in Healthcare Data Analytics

AUTHOR : Mohammad Alkhatib's , Amir Hossein Ghapanchi's

YEAR: 2016

ABSTRACT:

The main aim of this paper is to provide a deep analysis on the research field of healthcare data analytics. This paper is analyzing the previous studies and works in this research area, as well as highlighting some of guidelines and gaps. This study has used seven popular databases and selected most relevant papers, in order to conduct this paper. The paper has listed some data analytics tools and techniques that have been used to improve healthcare performance in many areas such as: medical operations, reports, decision making, and prediction and prevention system. Moreover, the systematic review has showed an interesting demographic of fields of publication, research approaches, as well as outlined some of the possible reasons and issues associated with healthcare data analytics, based on geographical distribution theme.

CASE STUDY III

TITLE : A Survey of Data Analytics in Healthcare

AUTHOR : Muhammad Umer Sarwar , Muhammad Kashif Hanif

YEAR: 2017

ABSTRACT:

Debate on big data analytics has earned a remarkable interest in industry as well as academia due to knowledge, information and wisdom extraction from big data. Big data and cloud computing are two most important trends that are defining the new emerging analytical tools. Big data has various applications in different fields like traffic control, weather forecasting, fraud detection, security, education enhancement and health care. Extraction of knowledge from large amount of data has become a challenging task. Similarly, big data analysis can be used for effective decision making in healthcare by some modification in existing machine learning algorithms. In this paper, rawbacks of existing machine learning algorithms are summarized for big data analysis in healthcare.

CASE STUDY IV

TITLE : A Systematic Review on Healthcare Analytics

AUTHOR : Md Saiful Islam , Md Mahmudul Hasan

YEAR: 2018

ABSTRACT:

The growing healthcare industry is generating a large volume of useful data on patient demographics, treatment plans, payment, and insurance coverage—attracting the attention of clinicians and scientists alike. In recent years, a number of peer-reviewed articles have addressed different dimensions of data mining application in healthcare. However, the lack of a comprehensive and systematic narrative motivated us to construct a literature review on this topic. In this paper, we present a review of the literature on healthcare analytics using data mining and big data. Following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we conducted a database search between 2005 and 2016. Critical elements of the selected studies—healthcare sub-areas, data mining techniques, types of analytics, data, and data sources—were extracted to provide a systematic view of development in this field and possible future directions. We found that the existing literature mostly examines analytics in clinical and administrative decision-making. Use of human-generated data is predominant considering the wide adoption of Electronic Medical Record in clinical care. However, analytics based on website and social media data has been increasing in recent years. Lack of prescriptive analytics in practice and integration of domain expert knowledge in the decision-making process emphasizes the necessity of future research.

CASE STUDY V

TITLE : Health-care Data and Databases

AUTHOR: Anthony C. Chang

YEAR: 2020

ABSTRACT:

Health-care data and databases are the foundational layer for artificial intelligence so a basic understanding of not only kinds of data but also types of databases is essential. The complex biomedical data landscape and its donundrum present challenges to artificial intelligence application to health-care projects. Big data and its “v”s (volume, variety, velocity, and veracity) are elucidated here with relevance to health care. The management of health-care data from processing and storage to interoperability is also discussed. A comparison of relational versus graph databases is presented for better understanding of these types of databases in health care. Finally, the data-to-intelligence continuum is discussed as an essential concept in artificial intelligence in health care and medicine.

CASE STUDY VI

TITLE :A survey on Data Mining approaches for Healthcare

AUTHOR: Divya Tomar

YEAR: 2013

ABSTRACT:

Data Mining is one of the most motivating area of research that is become increasingly popular in health organization. Data Mining plays an important role for uncovering new trends in healthcare organization which in turn helpful for all the parties associated with this field. This survey explores the utility of various Data Mining techniques such as classification, clustering, association, regression in health domain. In this paper, we present a brief introduction of these techniques and their advantages and disadvantages. This survey also highlights applications, challenges and future issues of Data Mining in healthcare. Recommendation regarding the suitable choice of available Data Mining technique is also discussed in this paper.

CASE STUDY VII

TITLE : A Review of Analytics and Clinical Informatics in Health Care

AUTHOR: Allan F Simpao, Luis M Ahumada, Jorge Galvez

YEAR: 2014

ABSTRACT:

Federal investment in health information technology has incentivized the adoption of electronic health record systems by physicians and health care organizations; the result has been a massive rise in the collection of patient data in electronic form (i.e. "Big Data"). Health care systems have leveraged Big Data for quality and performance improvements using analytics-the systematic use of data combined with quantitative as well as qualitative analysis to make decisions. Analytics have been utilized in various aspects of health care including predictive risk assessment, clinical decision support, home health monitoring, finance, and resource allocation. Visual analytics is one example of an analytics technique with an array of health care and research applications that are well described in the literature. The proliferation of Big Data and analytics in health care has spawned a growing demand for clinical informatics professionals who can bridge the gap between the medical and information sciences.

CASE STUDY VIII

TITLE : Current Practices in Clinical Analytics: A Hospital Survey Report

AUTHOR: Dana Womack, Rosemary Kennedy

YEAR: 2012

ABSTRACT:

Clinical analytics must become a pervasive activity in healthcare settings to achieve the global vision for timely, effective, equitable, and excellent care. Global adoption of the Electronic Health Record (EHR) has increased the volume of data available for performance measurement and healthcare organizational capacity for continuous quality improvement. However, EHR adoption does not automatically result in optimal use of clinical data for performance improvement. In order to understand organizational factors related to use of data for clinical analytics, a survey was conducted of hospitals and hospital-based clinics. The survey revealed sub-optimal use of data captured as a byproduct of care delivery, the need for tools and methodologies to assist with data analytics, and the need for disciplined organizational structure and strategies. Informatics nurse professionals are well-positioned to lead analytical efforts and serve as a catalyst in their facility's transformations into a data-driven organization.