AN ANALYSIS ON THE METHODS OF BIG DATA TOWARDS HEALTH CARE

Anumula Sai Charan[1], P. Srinivas[2]
[1]Student, Master of Technology, KITS, Warangal
[2]Assistant Professor, KITS, Warangal

Abstract: ***Big Data can join all patient related data to get a 360-degree perspective of the patient to dissect and anticipate results. It can enhance clinical practices, new drug improvement and social insurance financing process. It offers a lot of advantages, for instance, early ailment identification, extortion recognition and better medicinal services quality and effectiveness. This paper presents the Big Data idea and qualities, social insurance data and some main problems of Big Data. These issues incorporate Big Data benefits, its applications and openings in medicinal territories and human services. Techniques and innovation advance about Big Data are displayed in this examination. Big Data challenges in therapeutic applications and human services are similarly examined.***

Index Terms: Big Data, Health Care, Diagnosis, Privacy, Monitoring, Fraud Detection, E-Consultation, Big Data Analytics, Data Mining, Information Security

I. Introduction

Benefits of Big Data in Medical Applications and Health Care

Effective large-scale investigation often requires the collection of heterogeneous data from multiple sources. For example, getting the 360-degrees health view of a patient(or a populace) benefits from integrating and examining the medical health record alongside Internet available environmental data and after that even with readings from multiple types of meters (for example, glucose meters, heart meters, accelerometers, among others) (Jagadish et al., 2014).

Applying advanced analytics to patient profiles, characteristics and the cost and outcomes of care can help identify the most clinically and savvy treatments, proactively identify people who might benefit from preventative care or lifestyle changes. Big Data could help reduce waste and inefficiency in the accompanying three areas (Manyika et al., 2011):

•Clinical operations: Determine more clinically relevant and practical approaches to diagnose and treat patients

•Research and development:

(1) lower wearing down and produce a leaner, faster, moretargeted R&D pipeline in medications and devices with the help of predictive modeling;

(2) improve clinicaltrial design, in this way reducing trial failures and speeding new treatments to market; and

(3) identify take after on signs and discover adverse effects before items reach the market

•Public health:

(1) analyze disease patterns and track disease outbreaks and transmission to improve general health surveillance and speed response;

(2) faster develop more accurately targeted vaccines and

(3) transform large measures of data into actionable information

Big Data benefits in therapeutic applications and social insurance can be condensed as takes after (Helm-Murtagh, 2014; Raghupathi and Raghupathi, 2014): (1) Improvement of wellbeing results through more exact and exact findings; distinguishing proof of patients who are in peril of unfavorable results; and customization of care at the level of the individual patient (customized solution). (2) Reduction of costs through prior discovery of sickness; disposal of pointless and copy mind; lessening in assortments in care; and end of incorrect and despicable cases sections. (3) Predicting and supervising heftiness and wellbeing perils; distinguishing medicinal services misrepresentation all the more quickly and proficiently (Certain improvements or results may be anticipated or conceivably evaluated in view of monstrous measures of recorded data). (4) Decreasing unseemly Emergency Department (ED) utilization by using quantifiable models to recognize the best ED administrations or care choices that are more fitting, more advantageous and lower in cost by wellbeing conditions, before utilization of medicinal services assets (e.g., having a fundamental care supplier) and region to destinations of care. (5) Providing preferences to Health Informatics. This is satisfied by considering more tests cases or more highlights for look into, prompting both faster endorsement of studies and the ability to sufficiently collect cases for planning. Big Data approaches have been utilized for the examination of Health Informatics data assembled at various levels, including the atomic, tissue, patient and people levels. The measure of data delivered inside Health Informatics has turned out to be very monstrous. Big Data investigation surrenders conceivably incredible potential outcomes to expand much learning in Health Informatics.

II. Applications and Opportunities of Big Data in Medical Applications and Health Care

Big Data can give support over all parts of medicinal services. Big Data examination has picked up balance in genomics, pandemic spread forecast, clinical result, misrepresentation location, pharmaceutical improvement and customized tolerant care, and so forth. There are potential applications in these regions. The particular usages of Big Data in the zones are according to the accompanying.

Genomics Analytics

Genomic data is getting to be fundamental to the total patient record. Solidifying persistent genomic data with clinical data helps growth treatment (Chen et al., 2012; Priyanka and Kulennavar, 2014).

Flu Outbreak Prediction and Control

Out in the open and people wellbeing, industriously accumulating and inspecting general wellbeing data identifies and oversee potential malady out breaks. Big Data examination can mine online and electronic long range informal communication data topredict flu episodes in light of purchaser look, social substance and inquiry development (Priyanka and Kulennavar, 2014).

Clinical Outcome Analytics

Clinical examination can be performed through uniting clinical, cash related and task data for proficient clinical choices. Blue Cross and Blue Shield of North Carolina, USA has given a few promising cases of how Big Data can be utilized to lessen the cost of care, anticipate and oversee wellbeing shots and enhance clinical results (Helm-Murtagh, 2014).

Misrepresentation Detection and Prevention

Recognizing, anticipating and constraining misrepresentation can be actualized by using progressed efficient frameworks for extortion discovery and checking the precision and consistency of cases. Big Data prescient displaying can be utilized by social insurance payers for extortion counteractive action. Extortion waste and manhandle examination can be performed in looking at cases and advantages of Veterans advantages and instruction misrepresentation (White, 2014; Raghupathi and Raghupathi, 2014).

Restorative Device Design and Manufacturing

Big Data mechanical assemblies empower a more extensive arrangement of anatomical outlines, gadget materials, conveyance strategies and tissue collaborations to be assessed. Computational strategies and Big Data can expect a basic part in therapeutic gadget plan and collecting (Erdman and Keefe, 2013).

Customized Patient Care

Medicinal services is moving from a sickness focused model towards a patient-focused model. In an illness focused model, specialists' basic leadership is fixated on the clinical mastery and data from restorative proof and diverse tests. In a patient-focused model, patients effectively take an interest in their own specific care and get administrations concentrated on particular needs and inclinations. The patient-driven model makes a customized ailment chance profile, and furthermore a sickness administration outline and wellbeing prepare for a man. Customized social insurance is a data-driven approach. With the expansion in the utilization of electronic therapeutic records, Big Data will encourage to bring proactive and customized quiet care (Chawla Davis, 2013). Sooner rather than later, new big data-determined linkages will incite auspicious updates of patient triage, illustrative help and clinical rules to allow more exact and customized treatment to enhance clinical result for patients (Yang et al., 2014).

E-Consultation and Tele-Diagnosis

Later on, the accumulated ECG and pictures from mending offices worldwide will turn out to be big data, which should be utilized to build up an e-meeting program helping close-by specialists convey suitable treatment. Ongoing tele-meeting and tele-determination of ECG and pictures can be honed by methods for an e-arrange for clinical, look into and instructive purposes. Big Data investigation can anticipate over half passings with less false positives as contrasted and the regular ECG examination, conductedbased on a littler section of ECG signals (Hsieh et al., 2013).

Pharmaceuticals and Medicine

The limit of pharmaceutical organizations to keep bringing new life-saving/life improving medications to patients in an auspicious, yet fiscally keen way will reliant on their ability to oversee big data produced in the midst of all periods of pharmaceutical improvement. Incorporation of clinical, social insurance, licenses, security and open research data will give enter bits of information into basic leadership for target choice and lead progression through Big Data investigation for sedate disclosure (Schultz, 2013).

Therapeutic Education

Visual examination was investigated as a gadget for finding strategies for speaking to big data from the therapeutic instructive modules of an undergrad restorative program.

HIPAA: Health Insurance Portability and Accountability Act

A conceivable utilization of Big Data in the medicinal training setting (Vaitsis et al., 2014) is to: (1) distinguish data associations and the relations between them; (2) decide data's parts in the most minimal level of a course and in the general photo of the therapeutic program; (3) see and investigate the instructive modules as far as recognizing whether information, aptitudes and disposition are built through the arrangement of showing techniques and appraisal towards learning results and (4) perform opening examination by taking a gander at various states in which data can be found to recognize conceivable disparities.

Brilliant Health and Wellbeing

Business Intelligence and Analytics (BI&A) and the related field of Big Data examination have turned out to be progressively indispensable in

the business groups. Table 1 (Chen et al., 2012) outlines some BI&A highlights and capacities in savvy wellbeing and prosperity, including applications, data qualities, investigation and potential impacts.

Big Data has obtained awesome open doors restorative applications and medicinal services. Big Data applications will grow to more regions, (for instance, telemedicine and automated recuperating focuses), additionally enhance medicinal administration and convey broad esteem based care. Big Data applications and openings require innovation support.

III. Methods and Technology Progress in Big Data

In medicinal services/restorative field, expansive amount of data about patients' therapeutic accounts, symptomatology, findings and reactions to medications and treatments is gathered. Data mining systems can be executed to get information from this data with a specific end goal to either distinguish new intriguing examples in disease control data or to analyze detailing rehearses. Also, prescient models can be utilized as location instruments misusing Electronic Patient Record (EPR) gathered for every individual of the zone (Bellini et al., 2013).

For Big Data social insurance frameworks, the Hadoop-MapReduce system is interestingly fit for securing an extensive variety of human services data writes including electronic medicinal records, genomic data, cash related and ensures data and so forth besides, offers high flexibility, unwavering quality and openness than standard Database Management Systems (DBMS). In like manner, savvy valuable modules, for instance, specific machine-learning estimations for picture examination and acknowledgment, determination, reconnaissance, recognition, cautioning and so on., can be founded on it (Ngufor and Wojtusiak, 2013).

Visual examination exhibits a region of synergistic research with big data by conceptualizing the yield of complex procedures through natural graphical means. Measurements dash stacking up, continuous intelligent portrayal and Giga-hub outline investigation are a few illustrations that would fill in as proper observation answers for the big data cases. Unstructured data should be changed over into examination prepared datasets, which incorporate complete work forms for of big data courses of action. Thought of the structure of the end-data models is basic for the discernment procedure (Schultz, 2013).

Visual investigation joins data examination and control methods, data and learning portrayal and human intellectual quality to see and perceive visual examples (Vaitsis et al., 2014). Visual Analytics reinforces Big Data by giving intuitive observations that empower individuals to explore these datasets. Visual Analytics has been characterized as "the exploration of efficient thinking encouraged by intelligent visual interfaces "(Thomas and Cook, 2006).

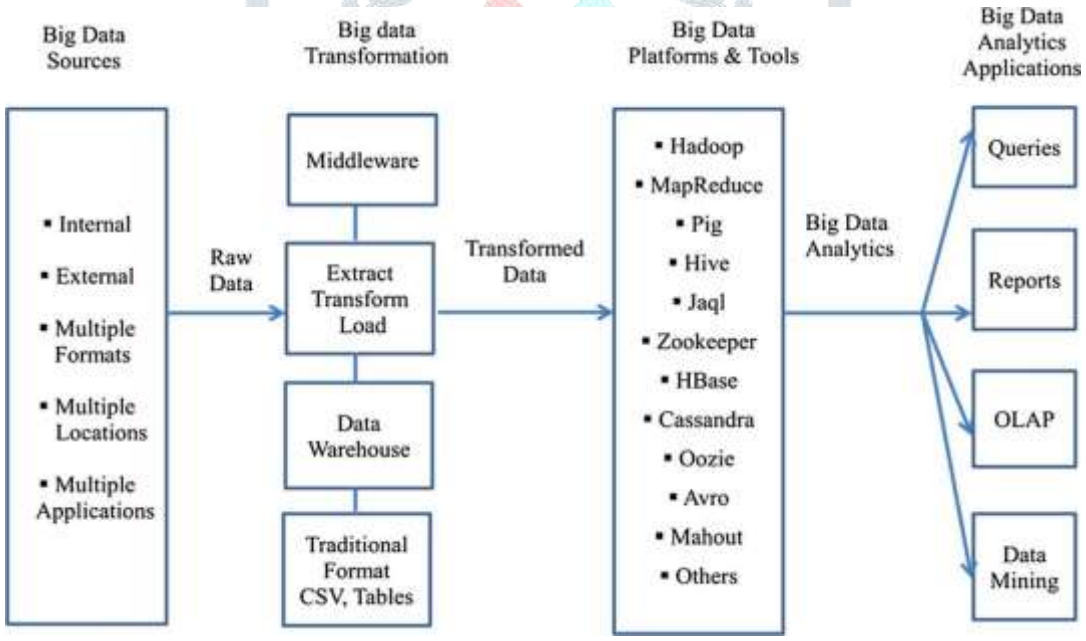

Fig. 1. An applied conceptual architecture of Big Data analytics (Raghupathi and Raghupathi, 2014) (OLAP: Online Analytical Processing; CSV: Comma Separated Values)

Big Data enabled by cloud technologies could provide us new bits of knowledge clinically, operationally and in research (Shrestha, 2014). The concept of storage-as-a-service distributed computing, which provides doctor's facilities with a big data storage limit based on their specific demands requiring little to no effort. In cardiology, distributed computing technology and mobile teleconsultation ought to be combined because mobile teleconsultation requires fast data delivery and a big data center where data can be delivered, stored, retrieved and managed securely (Hsieh et al., 2013).

Besides general cloud infrastructure services (storage, compute, infrastructure/VM management), the accompanying services are required to help Big Data (Turk, 2012):

•Cluster services
•Hadoop related services and devices
•Specialist data analytics devices (logs, events, data mining, etc.)
•Databases/Servers SQL, NoSQL
•MPP (Massively Parallel Processing) databases
•Registries, indexing/search, semantics, namespaces
•Security infrastructure (access control, strategy enforcement, confidentiality, put stock in, accessibility, privacy)

Associations used different methods of de-identification (anonymization, pseudonymization, encryption, key-coding, data sharing) to distance data from personal identities and preserve people's privacy. De-identification has been viewed as a critical protective measure to be taken under the data security and responsibility principles. Yet, over the previous few years, computer scientists have repeatedly demonstrated that even anonymized data can ordinarily be re-identified and associated with specific people. De-identified data, in other words, is a temporary state rather than a stable category (Tene and Polonetsky, 2013).

IV. Challenges of Big Data in Medical Applications and Health Care

Vast volume, speed and assortment of big data have procured big difficulties data stockpiling, curation, recovery, hunt and observation. Variability and veracity of big data demonstrate data wobbliness and vulnerability, which frequently makes Big Data investigation troublesome.

Critical difficulties of Big Data in medicinal applications and social insurance are according to the accompanying: (1) the data in various human services suppliers, particularly facilities, are regularly sectioned orsiloed. Clinical data, for instance, understanding history, pivotal signs, advance notes and expressive test outcomes are put away in the EHR. Quality and results data, for instance, surgical site contaminations, rates of come back to surgery and patient falls are in the quality or peril administration divisions. Benchmarks for favoring, setting and preparing data are required (White, 2014). (2) It is difficult to total and investigate unstructured data. Unstructured data include: Test comes about, checked records, pictures and advance notes in the patients' EHR, and so on. (White, 2014). Effectively dealing with extensive volumes of medicinal imaging data, removing conceivably helpful data and biomarkers and understanding unstructured clinical notes in the right setting are challenges (Priyanka and Kulennavar, 2014). (3) Analyzing genomic data is a computationally concentrated errand; joining with standard clinical data incorporates additional layers of multifaceted nature (Priyanka and Kulennavar, 2014). (4) A rising new data source is telemetry from persistent claimed gadgets and data entered by patients. The test of Big Data turns out to be significantly more noteworthy when telemetry from computerized checking gadgets is incorporated. Such data could incorporate subjective sign scores (distress, slant and adaptability); persistent detailed results; and gadget telemetry, for instance, weight, activity, glucose, circulatory strain and heartbeat oximetry (Halamka, 2014). The catch, ordering and handling of perpetually spilling (and maybe commented on) fine-grained worldly data is a test (Schultz, 2013). (5) Big Data's accentuation on relationships, not causality, is troublesome for specialists one-sided toward the biomedical model, where the focus is finding the reason for the malady so as to successfully treat it. Big data implies more data, yet there is regularly noisy data or false data (Bottles and Begoli, 2014). (6) Privacy issues in the Health Insurance Portability and Accountability Act (HIPAA) are frequently refered to as boundaries to gathering big data (Warner, 2013). In telecardiology and tele-counsel, data classification in the cloud, data interoperability among recuperating offices and system inactivity and availability are challenges (Hsieh et al., 2013). (7) Even if the security of the patient can be ensured, various medicinal services suppliers are hesitant to share data in light of market rivalry. It is difficult to decide the best possible harmony between ensuring the patient's data and keeping up the trustworthiness and comfort of the data. Open access, incorporation, organization of coherent and useable data is a test (White, 2014). (8) Data programmers have turned out to be all the more hurting in big data. Data spillage can be extreme. In March 2012, programmers broke into Utah's Department of Health database and downloaded individual data from 780,000 patients (Social Security Numbers were downloaded for 280,000 patients) (Schmitt et al., 2013). Biometrics, for instance, a unique mark enhances data security and ensure against data spillage. Be that as it may, it is generally difficult to ensure finish data security. (9) Both suppliers and payers indicated asset misfortunes, for instance, staffing, spending plan and framework as the big hindrances to the gathering of Big Data. Nonappearance of framework and arrangements, measures and practices that make by far most of big data in medicinal services were moreover refered to as a worry (Bulletin Board, 2014). (10) De-recognizable proof is the procedure by which by and by identifiable data is expelled from wellbeing data so that there can't be any linkage back to the individual in any way. HIPAA plots two methods for de-recognizing the data: Safe harbor and master assurance. The ability to accumulate and examine de-distinguished data is basic to driving down cost and improving quality. Concerns exist that data can't generally be totally de-recognized (Warner, 2013).

Big Data innovation challenges, for instance, date mix, data portrayal and data security will be overwhelmed with the advances of software engineering, logical estimation and different orders. Different difficulties, for instance, standards, data protection and possession and data sharing and cross-disciplinary joint exertion, and so forth require supports from organizations and governments in approaches. It is basic and important to solidify e-Infrastructures as constant stages to guarantee movement in Big Data.

V. Conclusion and Future Research

Big Data is based on data obtained from the whole process of diagnosis and treatment of each case. Big Data analytics can perform predictive modeling to determine which patients are well on the way to benefit from a care management design. It is pushing ahead rapidly in populace health and quality measurement. Big Data offers a ton of benefits, for example, disease prevention, reduced medical errors and the correct care at the opportune time and better medical outcomes. Also, Big Data can improve the Research and Development (R&D) and interpretation of new therapies. Big data can possibly improve medicine, guide clinicians in delivering value-based care.

Big Data has challenges in medical applications and healthcare. These challenges include solidifying and processing segmented or siloed data, aggregating and investigating unstructured data, indexing and processing consistently streaming data, privacy, data leakage, information security and absence of infrastructure and unified guidelines, etc.

A large portion of the above challenges can be future research themes. These future research subjects can be: Aggregating and breaking down unstructured health care data, indexing and processing of constantly stream data, medical data confidentiality and interoperability, health care data security and e-Infrastructures as persistent stages for health care big data, etc. The creators of the paper will center around Big Data in medical sensor data and streaming data processing, privacy-preserving data mining in health care, sentiment investigation of medical big data and personalization and behavioral modeling.

References

[1] Bellini, P., M. d. Claudio, P. Nesi and N. Rauch, 2013. Tassonomy and Review of Big Data Solutions Navigation. In: Big Data Computing, Akerkar, R. (Ed.), Chapman and Hall/CRC, pp: 57-101.

[2] Bottles, K. what's more, E. Begoli, 2014. Understanding the upsides and downsides of big data analytics. Doctor Exec., 40: 6-12.

[3] Bulletin Board, 2014. Industry assesses potential, challenges of big data. J. AHIMA.

[4] Chawla, N.V. what's more, D.A. Davis, 2013. Bringing big data to personalized healthcare: A patient-centered framework. J. General Internal Med., 28: S660-S665. DOI: 10.1007/s11606-013-2455-8

[5] Chen, H.C., R.H.L. Chiang and V.C. Story, 2012. Business intelligence and analytics: From big data to big effect. MIS Q., 36: 1165-1188.

[6] Demchenko, Y., P. Grosso and C. de Laat, 2013. Addressing big data issues in scientific data infrastructure. Proceedings of the International Conference on Collaboration Technologies and Systems, May 20-24, IEEE Xplore Press, San Diego, CA, USA, pp: 48-55.

[7] DOI: 10.1109/CTS.2013.6567203

[8] Dumbill, E., 2013. Understanding Big Data. Big Data. Eaton, C., D. Deroos, T. Deutsch, G. Lapis and P.

[9] Zikopoulos, 2012. Understanding big data. McGraw-Hill Companies.

[10] Erdman, A.G. what's more, D.F. Keefe, 2013. Excellent challenge: Applying regulatory science and big data to improve medical device advancement. IEEE Ttrans. Biomed. Eng., 60: 700-706.

[11] DOI: 10.1109/TBME.2013.2244600

[12] Halamka, J.D., 2014. Early experiences with big data at an academic medical center. Health Affairs, 33: 1132-1138. DOI: 10.1377/hlthaff.2014.0031

[13] Helm-Murtagh, S.C., 2014. Use of Big Data by Blue Cross and Blue Shield of North Carolina. NCMJ, 75: 195-197.

[14] Hsieh, J.C., A.H. Li and C.C. Yang, 2013. Mobile, cloud and big data figuring: Contributions, challenges and new directions in telecardiology. Int. J. Environ. Res. General Health, 10: 6131-6153.

[15] DOI: 10.3390/ijerph10116131

[16] Jagadish, H.V., J. Gehrke, A. Labrinidis, Y. Papakonstantinou and J.M. Patel et al., 2014. Big data and its technical challenges. Interchanges ACM, 57: 86-94. DOI: 10.1145/2611567

[17] Lee, J.H. also, E.J. Lee, 2014. Computer-aided diagnosis sensor and system of breast sonography: A clinical report. Sensors Transducers, 180: 1-10.

[18] Manyika, J., M. Chui, B. Dark colored, J. Buhin and R. Dobbs et al., 2011. Big data: The next frontier for advancement, competition and efficiency. USA: McKinsey Global Institute.

[19] Megahed, F.M. also, L.A. Jones-Farmer, 2013. A Statistical Process Monitoring Perspective on "Big Data", Frontiers in Statistical Quality Control, eleventh Edn., Springer, New York.

[20] Miller, K., 2012. Big data analytics in biomedical research. Biomedical Computation Review.

[21] Minelli, M., M. Chambers and A. Dhiraj, 2013. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Business. first Edn., John Wiley and Sons, Inc. Hoboken, New Jersey, USA, ISBN-10: 111814760X, pp: 187.

[22] Ngufor, C. also, J. Wojtusiak, 2013. Learning from large-scale distributed health data: An approximate strategic regression approach. Proceedings of the 30th International Conference on Machine Learning, Atlanta, Georgia, USA, JMLR: W&CP, pp: 1-8.

[23] O'Reilly Radar Team, 2012. Anticipating big data. O'Reilly.

[24] Priyanka, K. also, N. Kulennavar, 2014. A survey on big data analytics in health care. Int. J. Comput. Sci. Educate. Technologies, 5: 5865-5868.

[25] Raghupathi, W. also, V. Raghupathi, 2014. Big data analytics in healthcare: Promise and potential. Health Inform. Science Syst., 2: 1-10.

[26] DOI: 10.1186/2047-2501-2-3

[27] Rajpathak, T. what's more, A. Narsingpurkar, 2013. Overseeing knowledge from big data analytics in item development. White Paper, Tata Consultancy Services.

[28] Russom, P., 2011. Big data analytics. TDWI Best Practices Report, Fourth Quarter.

[29] Schmitt, C., M. Shoffner and P. Owen, 2013. Security and privacy in the era of big data: The SMW, a technological answer for the challenge of data leakage. RENCI, University of North Carolina at Chapel Hill.

[30] Schultz, T., 2013. Transforming healthcare challenges into big data opportunities: A use-case review over the pharmaceutical development lifecycle. Bull. Affiliation Inform. Sci. Technol., 39: 34-40.

[31] DOI: 10.1002/bult.2013.1720390508

[32] Shrestha, R.B., 2014. Big data and distributed computing.

[33] Applied Radiology.

[34] Tene, O. also, J. Polonetsky, 2013. Big data for all: Privacy and user control in the age of analytics. Northwestern J. Intellectual Property, 11: 239-272.

[35] Terry, N.P., 2013. Protecting patient privacy in the age of big data. UMKC Law Rev., 81: 385-415.

[36] B. Srinivas, Shoban Babu Sriramoju, "A Secured Image Transmission Technique Using Transformation Reversal" in "International Journal of Scientific Research in Science and Technology", Volume-4, Issue-2, February-2018, 1388-1396 [Print ISSN: 2395-6011 | Online ISSN: 2395-602X]

[37] B. Srinivas, Gadde Ramesh, Shoban Babu Sriramoju, "A Study on Mining Top Utility Itemsets In A Single Phase" in "International Journal for Science and Advance Research in Technology (IJSART)", Volume-4, Issue-2, February-2018, 1692-1697, [ISSN(ONLINE): 2395-1052]

[38] B. Srinivas, Gadde Ramesh, Shoban Babu Sriramoju, "An Overview of Classification Rule and Association Rule Mining" in "International Journal of Scientific Research in Computer Science, Engineering and Information Technology", Volume-3, Issue-1, February-2018, 643-650, [ISSN : 2456-3307]

[39] B. Srinivas, Shoban Babu Sriramoju, "Managing Big Data Wiki Pages by Efficient Algorithms Implementing In Python" in "International Journal for Research in Applied Science & Engineering Technology (IJRASET)", Volume-6, Issue-II, February-2018, 2493-2500, [ISSN : 2321-9653]

[40] Shoban Babu Sriramoju, "Analysis and Comparison of Anonymous Techniques for Privacy Preserving in Big Data" in "International Journal of Advanced Research in Computer and Communication Engineering", Vol 6, Issue 12, December 2017, DOI 10.17148/IJARCCE.2017.61212 [ISSN(online) : 2278-1021, ISSN(print) : 2319-5940]

[41] Shoban Babu Sriramoju, " Review on Big Data and Mining Algorithm" in "International Journal for Research in Applied Science and Engineering Technology", Volume-5, Issue-XI, November 2017, 1238-1243 [ISSN : 2321-9653], www.ijraset.com

[42] Shoban Babu Sriramoju, "OPPORTUNITIES AND SECURITY IMPLICATIONS OF BIG DATA MINING" in "International Journal of Research in Science and Engineering", Vol 3, Issue 6, Nov-Dec 2017 [ISSN : 2394-8299].

[43] Guguloth Vijaya, A. Devaki, Dr. Shoban Babu Sriramoju, "A Framework for Solving Identity Disclosure Problem in Collaborative Data Publishing" in "International Journal of Research and Applications" (Apr-Jun © 2015 Transactions), Vol 2, Issue 6, 292-295

[44] Shoban Babu Sriramoju, "Heat Diffusion Based Search for Experts on World Wide Web" in "International Journal of Science and Research", https://www.ijsr.net/archive/v6i11/v6i11.php, Volume 6, Issue 11, November 2017, 632 - 635, #ijsrnet

[45] Dr. Shoban Babu Sriramoju, Prof. Mangesh Ingle, Prof. Ashish Mahalle "Trust and Iterative Filtering Approaches for Secure Data Collection in Wireless Sensor Networks" in "International Journal of Research in Science and Engineering" Vol 3, Issue 4, July-August 2017 [ISSN : 2394-8299].

[46] Dr. Shoban Babu, Prof. Mangesh Ingle, Prof. Ashish Mahalle, "HLA Based solution for Packet Loss Detection in Mobile Ad Hoc Networks" in "International Journal of Research in Science and Engineering" Vol 3, Issue 4,July-August 2017 [ISSN : 2394-8299].

[47] Shoban Babu Sriramoju, "A Framework for Keyword Based Query and Response System for Web Based Expert Search" in "International Journal of Science and Research" Index Copernicus Value(2015):78.96

[48] [ISSN : 2319-7064].

[49] Sriramoju Ajay Babu, Dr. S. Shoban Babu, "Improving Quality of Content Based Image Retrieval with Graph Based Ranking" in "International Journal of Research and Applications" Vol 1, Issue 1,Jan-Mar 2014 [ISSN : 2349-0020].

[50] Dr. Shoban Babu Sriramoju, Ramesh Gadde, "A Ranking Model Framework for Multiple Vertical Search Domains" in "International Journal of Research and Applications" Vol 1, Issue 1,Jan-Mar 2014 [ISSN : 2349-0020].

[51] Mounika Reddy, Avula Deepak, Ekkati Kalyani Dharavath, Kranthi Gande, Shoban Sriramoju, "Risk-Aware Response Answer for Mitigating Painter Routing Attacks" in "International Journal of Information Technology and Management" Vol VI, Issue I, Feb 2014 [ISSN : 2249-4510]

[52] Mounica Doosetty, Keerthi Kodakandla, Ashok R, Shoban Babu Sriramoju, "Extensive Secure Cloud Storage System Supporting Privacy-Preserving Public Auditing" in "International Journal of Information Technology and Management" Vol VI, Issue I, Feb 2012 [ISSN : 2249-4510]

[53] Shoban Babu Sriramoju, "An Application for Annotating Web Search Results" in "International Journal of Innovative Research in Computer and Communication Engineering" Vol 2,Issue 3,March 2014
[54] [ISSN(online) : 2320-9801, ISSN(print) : 2320-9798]

[55] Shoban Babu Sriramoju, "Multi View Point Measure for Achieving Highest Intra-Cluster Similarity" in "International Journal of Innovative Research in Computer and Communication Engineering" Vol 2,Issue 3,March 2014 [ISSN(online) : 2320-9801, ISSN(print) : 2320-9798]

[56] Shoban Babu Sriramoju, Madan Kumar Chandran, "UP-Growth Algorithms for Knowledge Discovery from Transactional Databases" in "International Journal of Advanced Research in Computer Science and Software Engineering", Vol 4, Issue 2, February 2014 [ISSN : 2277 128X]

[57] Shoban Babu Sriramoju, Azmera Chandu Naik, N.Samba Siva Rao, "Predicting The Misusability Of Data From Malicious Insiders" in "International Journal of Computer Engineering and Applications"
[58] Vol V,Issue II,Febrauary 2014 [ISSN : 2321-3469]

[59] Ajay Babu Sriramoju, Dr. S. Shoban Babu, "Analysis on Image Compression Using Bit-Plane Separation Method" in "International Journal of Information Technology and Management", Vol VII, Issue X, November 2014 [ISSN : 2249-4510]

[60] Shoban Babu Sriramoju, "Mining Big Sources Using Efficient Data Mining Algorithms" in "International Journal of Innovative Research in Computer and Communication Engineering"
[61] Vol 2, Issue 1,January 2014 [ISSN(online) : 2320-9801, ISSN(print) : 2320-9798]

[62] Ajay Babu Sriramoju, Dr. S. Shoban Babu, "Study of Multiplexing Space and Focal Surfaces and Automultiscopic Displays for Image Processing" in "International Journal of Information Technology and Management"
[63] Vol V, Issue I, August 2013 [ISSN : 2249-4510]

[64] Dr. Shoban Babu Sriramoju, "A Review on Processing Big Data" in "International Journal of Innovative Research in Computer and Communication Engineering" Vol-2, Issue-1, January 2014
[65] [ISSN(online) : 2320-9801, ISSN(print) : 2320-9798]

[66] Shoban Babu Sriramoju, Dr. Atul Kumar, "An Analysis around the study of Distributed Data Mining Method in the Grid Environment : Technique, Algorithms and Services" in "Journal of Advances in Science and Technology"
[67] Vol-IV, Issue No-VII, November 2012 [ISSN : 2230-9659]

[68] Shoban Babu Sriramoju, Dr. Atul Kumar, "An Analysis on Effective, Precise and Privacy Preserving Data Mining Association Rules with Partitioning on Distributed Databases" in "International Journal of Information Technology and management" Vol-III, Issue-I, August 2012 [ISSN : 2249-4510]

[69] Shoban Babu Sriramoju, Dr. Atul Kumar, "A Competent Strategy Regarding Relationship of Rule Mining on Distributed Database Algorithm" in "Journal of Advances in Science and Technology"
[70] Vol-II, Issue No-II, November 2011 [ISSN : 2230-9659]

[71] Shoban Babu Sriramoju, Dr. Atul Kumar, "Allocated Greater Order Organization of Rule Mining utilizing Information Produced Through Textual facts" in "International Journal of Information Technology and management" Vol-I, Issue-I, August 2011 [ISSN : 2249-4510]

[72] Amitha Supriya. "Implementation of Image Processing System using Big Data in the Cloud Environment." International Journal for Scientific Research and Development 5.10 (2017): 211-217.

[73] SA Supriya. "A Survey Model of Big Data by Focusing on the Atmospheric Data Analysis." International Journal for Scientific Research and Development 5.10 (2017): 463-466.

[74] Monelli Ayyavaraiah, "Review of Machine Learning based Sentiment Analysis on Social Web Data" in "International Journal of Innovative Research in Computer and Communication Engineering" Vol 4,Issue 6,March 2016 [ISSN(online) : 2320-9801, ISSN(print) : 2320-9798]

[75] Monelli Ayyavaraiah, " A Study on Large-Scale Cross-Media Retrieval of Wikipedia Images towards Visual Query and Textual Expansion" in "International Journal for Research in Applied Science and Engineering Technology", Volume-6, Issue-II, February 2018, 1238-1243 [ISSN : 2321-9653], www.ijraset.com

[76] Monelli Ayyavaraiah, "Nomenclature of Opinion Miningand Related Benchmarking Tools" in "International Journal of Scientific & Engineering Research" Vol 7,Issue 8, February 2018, [ISSN 2229-5518]

[77] Siripuri Kiran, 'Decision Tree Analysis Tool with the Design Approach of Probability Density Function towards Uncertain Data Classification', International Journal of Scientific Research in Science and Technology(IJSRST), Print ISSN : 2395-6011, Online ISSN : 2395-602X,Volume 4 Issue 2, pp.829-831, January-February 2018. URL : http://ijsrst.com/IJSRST1841198

[78] Ajmera Rajesh, Siripuri Kiran, " Anomaly Detection Using Data Mining Techniques in Social Networking" in "International Journal for Research in Applied Science and Engineering Technology", Volume-6, Issue-II, February 2018, 1268-1272 [ISSN : 2321-9653], www.ijraset.com

[79] Siripuri Kiran, Ajmera Rajesh, "A Study on Mining Top Utility Itemsets In A Single Phase" in "International Journal for Science and Advance Research in Technology (IJSART)", Volume-4, Issue-2, February-2018, 637-642, [ISSN(ONLINE): 2395-1052]