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Chapter 1 : 5 big data statistical analysis methods | IoT | Big Data |

The world of client support has been generally staid and predictable for years, with innovation focused on reducing cost and streamlining efficiency, often at the customers' expense. The market is littered with either a confusing array of support choices or pre-packaged offerings that miss key.

April 15, Full Chapters Due: June 30, Submission Date: September 30, Introduction The significant increase in connected devices in Internet of Things will lead to an exponential increase in the data that an organization is required to manage. This is the point when IoT intersects wonderfully with big data and it becomes evident that the two trends fit one another very effectively. Big Data, on the other hand use analytics tools designed to handle large and fast-changing volumes of information. Big Data capacity is a prerequisite to tapping into the Internet of Things. What that means is that, without Big Data, the Internet of Things can offer an enterprise little more than noise. So, the Big Data and IoT has drawn great attention from both academia and industry, since it offers challenging notion of creating a world where all the things, known as smart objects around us are connected, typically in a wireless manner, to the Internet and communicate with each other with minimum human intervention. Another component set to help Big Data and IoT succeed is cloud computing, which acts as a sort of front end. IoT and Big Data is also fuelled by the advancement of digital technologies. The use of Artificial Intelligence technologies like deep learning will be a key differentiator to derive insights rapidly from massive streams of data. With IoT, Big Data analytics would also move at the edge for real-time decision making. Machine learning and predictive analytics open up new opportunities for enterprises, Internet of Things has moved from being hype to becoming a reality. All these new solutions require new skill sets and qualities, which also force cultural change within organizations. To sum it up, the combination of Big Data and IoT will enable new monitoring services and powerful processing of sensory data streams. These applications alongside implementation details and challenges should also be explored for successful mainstream adoption. Objective The main objective of this proposal is to encourage both researchers and practitioners exchange their thoughts and recent research in IoT between academia and industry. Contributors may present open technical evaluation and comparisons with existing standards. Theoretical, as well as experimental studies related to real-life scenarios, are encouraged. The main objective of this proposal is to encourage both researchers and practitioners exchange their thoughts and recent research in Big Data and IoT between academia and industry. The overall objectives are: Target Audience The primary target audiences for this discourse are educators and learning practitioners in higher education, industry, as well as governmental agencies and industrialist and professional those are interested in exploring and implementing the Big Data, IoT and related technologies. This book will serve as a reference book of scholarly value for advanced level students, researchers, and professionals. Graduate students, researchers, academicians,industrialists and professionals that are interested in exploring and implementing the IoT and related technologies of Big Data and IoT Research Groups. Recommended Topics The technical contents should be within but not limited to the following domains: Authors will be notified by April 30, about the status of their proposals and sent chapter guidelines. Full chapters are expected to be submitted by June 30, , and all interested authors must consult the guidelines for manuscript submissions at http: All submitted chapters will be reviewed on a double-blind review basis. Contributors may also be requested to serve as reviewers for this project. There are no submission or acceptance fees for manuscripts submitted to this book publication, Handbook of Research on Big Data and the IoT. All manuscripts are accepted based on a double-blind peer review editorial process. IGI Global specializes in publishing reference books, scholarly journals, and electronic databases featuring academic research on a variety of innovative topic areas including, but not limited to, education, social science, medicine and healthcare, business and management, information science and technology, engineering, public administration, library and information science, media and communication studies, and environmental science. For additional information regarding the publisher, please visit www. This publication is anticipated to be released in Important Dates Chapter proposal submission deadline:

Chapter 2 : RESEARCH PAPER: IoT and Big Data Reshape Support | Moor Insights & Strategy

This white paper aims to explain the challenges and discuss how big data analytics is used to architect IoT solutions. 'Big data' efforts have solved many IoT analytics challenges, particularly system challenges related to large-scale data management, learning, and data visualizations.

Big Data is transforming science, engineering, medicine, healthcare, finance, business, and ultimately society itself. Of those, 44 regular papers and 53 short papers were accepted, which translates into a selectivity that is on-par with top tier conferences. Also, there were 14 workshops associated with IEEE Big Data covering various important topics related to various aspects of Big Data research, development and applications, and more than participants from 40 countries attend the 4-day event. It will provide a leading forum for disseminating the latest research in Big Data Research, Development, and Applications. This includes but is not limited to the following: Big Data Science and Foundations a. Novel Theoretical Models for Big Data b. New Computational Models for Big Data c. Data and Information Qualityfor Big Data d. New Data Standards a. Energy-efficient Computing for Big Data e. Big Data Open Platforms h. Big Data Management a. Algorithms and Systems for Big DataSearch c. Distributed, and Peer-to-peer Search d. Visualization Analytics for Big Data g. Computational Modeling and Data Integration h. Link and Graph Mining k. Semantic-based Data Mining and Data Pre-processing l. Mobility and Big Data m. Big Data Search and Mining a. Social Web Search and Mining b. Algorithms and Systems for Big DataSearch d. Distributed, and Peer-to-peer Search e. Visualization Analytics for Big Data h. Computational Modeling and Data Integration i. Link and Graph Mining l. Semantic-based Data Mining and Data Pre-processing m. Mobility and Big Data n. Intrusion Detection for Gigabit Networks b. High Performance Cryptography d. Visualizing Large Scale Security Data e. Threat Detection using Big Data Analytics f. Privacy Threats of Big Data g. User Studies for any of the above j. Sociological Aspects of Big Data Privacy 6. Big Data Applications a. Big Data as a Service f. Big Data Industry Standards g. The focus of industry track is on papers that address the practical, applied, or pragmatic or new research challenge issues related to the use of Big Data in industry. We accept full papers up to 10 pages and extended abstracts pages. Please submit a full-length paper upto9 page IEEE 2-column format through the online submission system.

Chapter 3 : Special report: Sensor'd enterprise: IoT, ML, and big data (free PDF) - TechRepublic

In this call, we seek high quality papers that can demonstrate proofs-of-concept, services, solutions for research challenges, case studies, analytics, real world examples and successful deliveries of Big Data and IoT fusion.

These Microsoft Azure infrastructure-as-a-service IaaS training courses cover key technical topics for IT pros and developers, including Azure Virtual Machines and virtual networks. In addition, IT pros can gain insight into platform-as-a-service PaaS implementation, including using PowerShell for automation and management, using Active Directory, migrating from on-premises to cloud infrastructure, and important licensing information. Enroll in our Azure training courses and discover the advantages of cloud computing with Microsoft Azure. One year ago, The Turing first opened its doors to 37 PhD students, Turing Fellows and visiting researchers, 6 research software engineers and more than 5,â€¦ Measuring human happiness and frustration using data science in the cloud Emotions make us human. Researchers at The Alan Turing Institute in the United Kingdom are using artificial intelligence and machine learning to push the state of the art in data science to better understand what makes us happy, angry and frustrated. Researchers in the United Kingdom are harnessing the large-scale data-processing power of Microsoft Azure to map the location of every person on Earth to provide the accurate population statistics needed to achieve this international humanitarian goal. In fact, water availability is a cause for worry in the entire country. According to an estimate by The Asian Developmentâ€¦ From cancer to crop genomics â€" using Research as a Service at the intersection of computers and biology Ever since Nicola Bonzanni was a little boy playing in the tiny Italian village of Bonate Sotto, just north of Milan, he was fascinated by nature and by building things. As he grew up, he wondered how computing and nature might be intertwined. But how do they know that they are making the best decisions? Can artificial intelligence AI help? What has happened in the last 20, 30 years is that the healthâ€¦ A new understanding of the world through grassroots Data Science education at UC Berkeley While some may regard data science as an easy passport to a job for the tech savvy, Luis Macias has different ideas. The fourth-year undergraduate student, who is majoring in American Studies at University of California, Berkeley UC Berkeley , wants to turn the hype of data science into hope for low-incomeâ€¦ Cloud computing changes the way we practice public speaking People often rank public speaking as the number one fear that they face. New cloud-based technology from researchers at the University of Rochester lets speakers polish and practice at home in front of their computer camera, while the analysis provides instant feedback about improvement. Ehsan Hoque, an assistant professor ofâ€¦ Preventing flood disasters with Cortana Intelligence Suite On October 31, , the city of Austin, Texas, faced a destructive flood. The day before the flood, we had been discussing research and analytics around the long-standing drought conditions across western Texas. Now he is part of a research team at the University of Oxford using cloud computing and mobile sensors to monitor water wells and help ensure that thousands of villages in rural Africa and Asia have a safe, secure supply of water. Millions of people across the world fear not havingâ€¦ Buckled up and ready to go? Untangling airports using open source tools on Microsoft Azure Nobody likes a delay at the airport. Many of us have spent time buckled up, ready for takeoff, wondering why our plane is stuck on its way between the gate and the runway. Scientists in the United Kingdom are working hard to help untangle these airport operations, to help save fuel, money, and impact on the environmentâ€¦ Predicting ocean chemistry using Microsoft Azure Shellfish farmer Bill Dewey remembers the first year he heard of ocean acidification, a phrase that means a change in chemistry for ocean water. It was around , and Dewey worked for Taylor Shellfish, a company that farms oysters in ocean waters off the coast of Washington. His daughter, worried by his increasing frailty, took him to the emergency room at the local hospital. Her concern was amply justified: Stuart was suffering from heart failure. Cars stack up bumper-to-bumper, clogging our highways, jangling our nerves, taxing our patience, polluting our air, and taking a toll on our productivity. In short, traffic jams impair on our emotional, physical, and economicâ€¦ Cloud computing helps make sense of cloud forests The forests that surround Campos do Jordao are among the foggiest places on Earth.

Chapter 4 : IoTBDS - CallForPapers

Topics include IoT system architecture, IoT enabling technologies, IoT communication and networking protocols such as network coding, and IoT services and applications. Examples are IoT demands, impacts, and implications on sensors technologies, big data management, and future Internet design for various IoT use cases, such as smart cities.

If objects have a life that is innate, what would happen if these objects go further and were capable of storing data, sensing the environment and communicating with each other? That is the kind of life that the Internet of Thing offers to new electronic devices. The IoT includes different technology infrastructure, devices and services such as the cloud, computing, data analytics and mobile communications. The IoT is not a prediction; it is a plausible trend that is moving forward, rapidly. It is estimated that by , 50 billion devices around the world will be connected to the Internet. There are major platforms and discoveries that have had a rich wage of complexity, global reach and novelty. But the IoT is for sure a trend that takes the development of interconnectivity to another level, one that once was only imaginable. While it is true that the IoT will signify a major shift in the economy, politics and regulations from all government agencies, companies, and non-profit organizations, this paper will only focus on the effects that it will have on citizens by arguing that, although the development of the IoT is still on early phases regarding its development and spread, it is potentially a threat to both security and privacy. Since the IoT is a rapidly growing trend, most major companies are seeking to get involved, there are enormous efforts to trigger this trend as something positive in the forthcoming future. A frequent discourse that is present in the media mentions the major positive technological improvement that the IoT represents. How fantastic it would be that your car could save information about what routes you take every day? Who would not want a house that can monitor and regulate the temperature to save energy? Or a watch that can save your sleep pattern information? If all devices are connected to the Internet, this means that they are vulnerable to be hacked. Many devices connected to the Internet collect valuable personal information from users, such as name, address, date of birth, health information and credit cards numbers. What the HP study reveals is that all this information is vulnerable to potential hacker attacks. Insurance companies have embraced with joy the arrival of the IoT, claiming that they could develop ways to gather data on health-related behavior and habitus to design their rate offerings. Devices that measure physical activity, blood pressure, blood sugar, weight and other health related metrics could provide useful health information about individuals to insurance companies. What could insurance companies do when they notice that there is an increase on blood sugar levels in adults over 35 years old? What does the data show about the most common disease for adults over 60 years old? What they decide to do with this information is unknown. The fact that the infrastructure that supports the Internet-connected devices is unreliable and can fail represents a disadvantage to the IoT as well. The infrastructure that supports the Internet works differently across diverse geographical areas. For example, in Mexico Telmex has the monopoly as the company that provides Internet to users and companies. It is expensive, unreliable and it fails frequently. Furthermore, since the Internet service is expensive, many individuals do not have this service, therefore the IoT could increase the damage caused by the digital divide. Furthermore, changes in the environment and weather conditions remain as an obstacle to objects connected to the Internet. What happens during a power electricity cut? What happens to these objects during a time of catastrophe or natural disaster? Finally, there is the environmental impact that the development and spread of the global IoT will bring. If we take into consideration this information and the fact that by , 50 billion devices around the world will be connected to the Internet, it is crucial that we think about the environmental impact that the IoT will cause and question what can be done to prevent it. The IoT will be here sooner rather than later, for now it is a trend that is running fast to become a reality. Under this fact it is essential that we demand public access to technological knowledge about the IoT. Technology moves faster than the development of proper legal measures and action to regulate it. We need to ask how can we be certain that the IoT is something that will not harm our privacy and safety. Who is building this technology and who owns it? What institutions could we approach in case of concern or discomfort? Where is the line between what is legal and what is illegal? What happens if we choose not to participate in this technology? What is it necessary to arise greater public interest in what are the implications of the interconnectivity of all the devices that rule our environmental daily life and habitus? All these questions are genuine and each one of them deserves an answer. HP, 29 July Parks, Lisa, and Nicole Starosielski. Critical Studies of Media Infrastructures. U of Illinois, Security Risks From the Smart Home. The New York Times, 07 Jan.

Chapter 5 : Research Paper â€“ The Internet of Things â€“ Future of New Media

Therefore, Big Data Analytics is a current area of research and development that has become increasingly important. This article investigates cutting-edge research efforts aimed at analyzing Internet of Things (IoT) data.

Introduction A typical IoT system would comprise the architecture depicted in Figure 1; sensors would collect data and transfer them to a gateway, which in turn would send them to a processing system analytics cloud. The gateway can choose either to or not summarize or preprocess the data. The connection between sensors and gateway would be via Radio Frequency e. Zigbee , BLE, Wifi, or even wired connections. Often, the gateway is a mobile phone. Assuming that part is done, how hard is it to figure out IoT analytics? Is it just a matter of offloading the data into one of the IoT analytics platforms or are there hidden surprises? This white paper aims to explain the challenges and discuss how big data analytics is used to architect IoT solutions. IoT data, in contrast, will come from the natural world, would be more detailed, fuzzy, and large. The nature of that data, assumptions, and use cases differ between old big data and new IoT data. IoT analytics designers can build on top of big data, yet the work would be far from being done. This would generally depend on how fast you need results from the data gathered and your design changes and would vary according to each use case. You would need to consider if the value of your insights i. Speed comes in several levels A few hours â€" send your data into a data lake and use a MapReduce technology, such as Hadoop or Spark for processing A few seconds â€" send data into a stream processing system e. Apache Storm or Apache Samza , an in-memory computing system e. VoltDB, Sap Hana , or an interactive query system e. Apache Drill for processing A few milliseconds â€" send data to a system like complex event processing where records are processed one by one and produce very fast outputs. Figure 2 summarizes those observations. Figure 02 How much data should you keep? Next, we should decide how much data to keep and in what form. It is a tradeoff between cost versus potential value of data and associated risks. In recent times, companies have been acquired just for their data, while Google and Facebook have gone to extraordinary lengths to access data. Moreover, you may find a bug or improvement in the current algorithm, and might want to go back and rerun the algorithm on old data. Yet, all decisions must be made considering the bigger picture and current limits. The choices are as follows: Keep all the data and save it to a data lake the argument is that disk is cheap Process all the data in a streaming fashion and not keep any data at all Keep a processed or summarized version of the data; however, it is possible that you cannot recover all the information from the summaries later The next question is where to do the processing and how much of that logic you should push towards the sensors. Pushing logic towards sensors will let your system scale further. There are three options as follows: Do all processing at analytics servers Push some queries into the gateway Push some queries down to sensors as well The IoT community already has the technology to push the logic to gateways. Most gateways are fully-fledged computers or mobile phones, and they can run higher level logic, such as SQL-like CEP queries. However, if you want to push code into sensors, in most cases, you would have to write custom logic using a lower level language like Arduino C. Another associated challenge is deploying, updating, and managing queries over time. Hindsight, Insight, or Foresight? Hindsight, insight, and foresight are three questions that come to mind when dealing with data; to know what happened, to understand what happened, and to predict what will happen. Hindsight is possible with aggregations and applied statistics. You can aggregate data by different groups and compare those results using statistical techniques, such as confidence intervals and statistical tests. A key component is data visualization that will show related data in context2. Insight and foresight would require machine learning and data mining. This includes finding patterns, modeling current behavior, predicting future outcomes, and detecting anomalies. Refer to data science and machine learning tools e. IoT analytics will pose new types of problems and demand more focus on some existing problems. Some problems that are likely to play a key role in IoT analytics are as follows: Time series processing Most IoT data are collected via sensors over time. Hence, they are time series data, and often most readings are autocorrelated, e. However, most machine learning algorithms e. Random Forests or SVM do not consider autocorrelation. Hence, those algorithms would often do poorly while predicting using IoT data. This problem has been extensively studied under time series analysis e. However, widely used big data frameworks, such as Apache Spark and Hadoop, do not support these models yet. The IoT analytics community has to improve these models, build new models when needed, and incorporate them into big data analytics frameworks3. Anomaly detections Many IoT use cases like predictive maintenance, health warnings, finding plug points that consumes too much power, optimizations, etc. Anomaly detection poses several challenges. Lack of training data â€” most use cases would not have training data, and hence unsupervised techniques, such as clustering, should be used Class imbalance â€" Even when training data is available, often there will be a few dozen anomalies that exist among millions of regular data points. This problem is generally handled by building an ensemble of models where each model is trained with anomalous observations and resampled data from regular observations. Click and explore â€" after detecting anomalies, they must be understood in context and vetted by humans. Tools, therefore, are required to show those anomalies in context and enable operators to explore data further starting from the anomalies. For example, if an anomaly in a turbine is detected, it is useful to see that anomaly within regular data before and after the anomaly as well as to be able to study previous similar cases. Acting on IoT data acting Once the data has been analyzed and actionable insights have been identified, you would need to decide on the next course of action. There are several choices to this end. Figure 03 Visualize the results â€" build a dashboard that shows the data in context and let users explore, drill-down, and carry out root cause analysis Alerts â€" detect problems and notify the user via email, SMS, or pager devices. Finding the balance between false positives and ignoring actual problems will be tricky Carrying out actions â€" the next level is independent actions with open control loops; however, unlike in the former case, the risk of a wrong diagnosis could have catastrophic consequences. Until we have a deeper understanding of the context, use cases would be limited to simple applications like turning off a light, adjusting heating, etc. The system would continuously monitor and control the environment or the underlying process in a closed control loop. The system has to understand the context, the environment, and should be able to work around failures of actions. Much related work has been carried out under theme autonomic computing although only a few use cases were eventually deployed. Real-life production deployment of this class, however, are several years away due to associated risks. In general, the move towards automation is prompted by the need for fast responses e. More automation can be cheaper in the long run, but is likely to be complex and expensive in the short run. As evidenced by stock market crashes, the associated risks cannot be underestimated. It is worth noting that carrying out automation with IoT will be harder than big data automation use cases. Most big data automation use cases either monitor computer systems or controlled environments like factories. In contrast, IoT data would often be fuzzy and uncertain. It is one thing to monitor and change a variable in automatic price setting algorithm. However, automating a use case in the natural world e. If you decide to pursue the automation route, you need to spend a significant amount of time to understand, test, and re-test the scenarios. Data from most devices would have the following fields: Timestamp TLocation, grouping, or proximity data TSeveral readings associated with the device, e. The first use case is to monitor, visualize, and alert about a single device data. This use case focuses on individual device owners. However, more interesting use cases occur when you look at devices as part of a larger system like a fleet of vehicles, buildings in a city, a farm, etc. Among the aforementioned fields, time and location will play a key role in most IoT use cases. By using these two, you can categorize most use cases into two classes: Their location is useful only as a grouping mechanism, but the main goal is to monitor an already deployed system in operation. Some of the use cases are as follows: View of the current status, alerts on problems, drill down, and root cause analysis Optimization of current operations Surveillance Moving dots Among examples of moving dot use cases are fleet management, logistic networks, wildlife monitoring, monitoring customer interactions in a shop, traffic, etc. The goal of these use cases is to understand and control movements, interactions, and behavior of participants as illustrated in this screencast - [Screencast] Analyzing Transport for London Data with WSO2 CEP. Some examples are as follows: Sports analytics refer to Real Time Analytics for Football - a sports analytics use case built using data from an actual football game Geofencing and speed limits Monitoring customer behavior in a shop, guided interactions, and shop design improvements Visualizing e. However, specific machine learning models, such as anomaly detection, would need expert intervention for best results. Such tools, if done right, could facilitate reuse, reduce cost, and improve the reliability of IoT systems. A key secret of big data success so far has been the availability of high quality, generic open source middleware tools. Scanalytics focuses on foot traffic monitoring and Second spectrum focuses on sport analytics. Although expensive, they would provide an integrated, ready-to-go solution. IoT system designers have a choice to either opt for a specialized vendor or build on top of open source tools e. The WSO2 Analytics platform combines into one integrated platform real-time and batch analysis of data with predictive analytics via machine learning to support the multiple demands of IoT solutions, as well as mobile and web apps. It also has the capability to organize and analyze data that would have been previously inaccessible or unusable. Moreover, it builds on the fast performance of the open source Siddhi CEP engine developed by WSO2 by adding streaming regression and anomaly detection operators to facilitate fraud and error detection. The comprehensive platform provides a single solution that enables developers to build systems and applications that collect and analyze information and communicate the results. It has been designed to treat millions of events per second, and is therefore capable to handle the volumes in big data and IoT projects.

Chapter 6 : IOT INTERNET OF THINGS IEEE PAPER

The 'internet of things' (IoT) and 'big data' are two of the most-talked-about technology topics in recent years, which is why they occupy places at or near the peak of analyst firm Gartner's most.

Chapter 7 : IOT Research Papers - calendrierdelascience.com

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Chapter 8 : IEEE International Conference on Big Data

Research: Big data and IOT - Benefits, drawbacks, usage trends Originally Published: Feb Big data and the Internet of Things, which is popularly known as IoT, are two rapidly growing technological forces which have often blended together amidst new advances and possibilities.

Chapter 9 : IoT Analytics: Using Big Data to Architect IoT Solutions

View IOT Research Papers on calendrierdelascience.com for free. The paper describes how the sensed data will be processed and stored in cloud and from cloud the data will be.