Literature survey

Title : Smart Farmer-IOT Enabled Smart Farming Application.

- **Team Leader: P.Varalakshmi**
- **Team members:**
  > **S.Subashini**
  > **S.Swathi**
  > **R.Vasuki**
  > **R.Rathna**

1)**Topic**: Emerging Smart Logistics and Transportation Using IoT and Blockchain

Author: Mamoona Humayun, NZ Jhanjhi, Bushra Hamid, Ghufran Ahmed.

Abstract: Transportation and logistics management play a vital role in the development of a country. With the advancement of the Internet of Things (IoT) devices, smart transportation is becoming a reality. However, these abundant connected IoT devices are vulnerable to security attacks. Recently, Blockchain has emerged as one of the most widely accepted technologies for trusted, secure and decentralized intelligent transportation systems. This research study aims to contribute to the field of logistics and transportation by exploring the potential of IoT and Blockchain technology in smart logistics and transportation. We propose a layered framework, namely BCTLF, for smart logistics and transportation that integrates IoT and Blockchain to provide an intelligent logistics and transportation system. Finally, we

present two real-life IoT and Blockchain-based case studies to highlight the contribution of IoT and Blockchain in logistics and transportation.

2)Topic: Multitier Fog Computing With Large-Scale IoT Data Analytics for Smart Cities.

Author: Jianhua He, Jian Wei, Kai Chen, Zuoyin Tang, Yi Zhou, Yan Zhang.

Published : IEEE Internet of Things Journal (Volume: 5, Issue: 2, April 2018)

Abstract: Analysis of Internet of Things (IoT) sensor data is a key for achieving city smartness. In this paper a multitier fog computing model with large-scale data analytics service is proposed for smart cities applications. The multitier fog is consisted of ad-hoc fogs and dedicated fogs with opportunistic and dedicated computing resources, respectively. The proposed new fog computing model with clear functional modules is able to mitigate the potential problems of dedicated computing infrastructure and slow response in cloud computing. We run analytics benchmark experiments over fogs formed by Rapsberry Pi computers with a distributed computing engine to measure computing performance of various analytics tasks, and create easy-to-use workload models. Quality of services (QoS) aware admission control, offloading, and resource allocation schemes are designed to support data analytics services, and maximize analytics service utilities. Availability and cost models of networking and computing resources are taken into account in QoS scheme design. A scalable system level simulator is developed to evaluate the fog-based analytics service and the QoS management schemes. Experiment results demonstrate the efficiency of analytics services over multitier fogs and the effectiveness of the proposed QoS schemes. Fogs can largely improve the performance of smart city analytics services than

cloud only model in terms of job blocking probability and service utility.

3)Topic: Smart community: an internet of things application

Author: Xu Li, Rongxing Lu, Xiaohui Liang, Xuemin Shen, Jiming Chen, Xiaodong Lin.

Published: IEEE Communications Magazine (Volume: 49, Issue: 11, November 2011)

Abstract: In this article, we introduce an Internet of Things application, smart community, which refers to a paradigmatic class of cyber-physical systems with cooperating objects (i.e., networked smart homes). We then define the smart community architecture, and describe how to realize secure and robust networking among individual homes. We present two smart community applications, Neighborhood Watch and Pervasive Healthcare, with supporting techniques and associated challenges, and envision a few valueadded smart community services.

4)Topic: An Integrated IoT Architecture for Smart Metering

Author: Jaime Lloret, Jesus Tomas, Alejandro Canovas, Lorena Parra

Published: IEEE Communications Magazine (Volume: 54, Issue: 12, December 2016)

Abstract: Advanced meter infrastructures (AMIs) are systems that measure, collect, and analyze utilities distribution and consumption, and communicate with metering devices either on a schedule or on request. AMIs are becoming a vital part of utilities distribution network and allow the development of Smart Cities. In this article we propose an integrated Internet of Things architecture for smart meter networks

to be deployed in smart cities. We discuss the communication protocol, the data format, the data gathering procedure, and the decision system based on big data treatment. The architecture includes electricity, water, and gas smart meters. Real measurements show the benefits of the proposed IoT architecture for both the customers and the utilities.

5)Topic: Everything you wanted to know about smart cities: The Internet of things is the backbone

Author: Saraju P. Mohanty, Uma Choppali, Elias Kougianos

Published: IEEE Consumer Electronics Magazine (Volume: 5, Issue: 3, July 2016)

Abstract: This article is a single-source introduction to the emerging concept of smart cities. It can be used for familiarizing researchers with the vast scope of research possible in this application domain. The smart city is primarily a concept, and there is still not a clear and consistent definition among practitioners and academia. As a simplistic explanation, a smart city is a place where traditional networks and services are made more flexible, efficient, and sustainable with the use of information, digital, and telecommunication technologies to improve the city's operations for the benefit of its inhabitants. Smart cities are greener, safer, faster, and friendlier. The different components of a smart city include smart infrastructure, smart transportation, smart energy, smart health care, and smart technology. These components are what make the cities smart and efficient. Information and communication technology (ICT) are enabling keys for transforming traditional cities into smart cities. Two closely related emerging technology frameworks, the Internet of Things (IoT) and big data (BD), make smart cities efficient and responsive. The technology has matured enough to allow smart cities to emerge. However, there is much needed in terms of physical infrastructure, a smart city, the digital technologies

translate into better public services for inhabitants and better use of resources while reducing environmental impacts. One of the formal definitions of the smart city is the following: a city "connecting the physical infrastructure, the information-technology infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city". Another formal and comprehensive definition is "a smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operations and services, and competitiveness

6)Topic: Smart Rural Village's Healthcare and Energy Indicators—Twin Enablers to Smart Rural Life

Author: PW Maja, J Meyer, S von Solms

Abstract: Poverty in rural areas remains rife and high despite the rapid societal developments and technological advancements the world is riding on, brought about by the advent of the Fourth Industrial Revolution. Most communities and individuals in many rural areas of the world often face near zero to limited access to basic services such as access to energy and healthcare. The study's objective is to develop linkages between smart rural health indicators and smart rural energy indicators. This is achieved by using a six-stage method developed over a two year period. The method uses sustainable development goals as a point of departure; however, in this study, the focus is on healthcare and energy access. The following indicators has been derived: the number of patients in a village monitored remotely, the number of persons having access to a mobile health clinic powered by a renewable energy source, the number of network routers powered by renewable energy to enable drone usage in a village, and the accessibility of a patient's database by the village surgeon remotely due to reliable and

accessible servers powered by a mixture of sustainable and renewable energy. The paper concludes that a sustainable, renewable energy mix acts as the enabling link that renders healthcare services in rural villages accessible to all.

7)Topic: Trust management with fault-tolerant supervised routing for smart cities using internet of things

Author: Khalid Haseeb, Tanzila Saba, Amjad Rehman, Zara Ahmed, Houbing Herbert Song, Huihui Helen Wang.

Abstract: The Internet of Things (IoT) connects heterogeneous sensors with dynamic networks to monitor smart communication and collect real-time data. Such systems are well adapted to satisfy the needs of smart cities and facilitate remote locations. Many cloud-based solutions for effective routing along with scalable data storage have been presented for constraint IoT systems. However, because of the unpredictable nature of mobile networks and communication links, most of the solutions may not be suitable for realistic applications and usually result in path failure with increasing resource utilization. Hence, data forwarding is only reliable and valuable if the proposed algorithms are trust-aware with low overheads and consume balanced energy among nodes. Therefore, this paper proposed a fault-tolerant supervised routing (Trust-FTSR) model for trust management in IoT network, to improve trustworthiness and collaborative communication in smart cities. Each node evaluates the behavior of its neighbors and establishes a direct trust for a reliable and optimized network structure. In addition, using a supervised machine learning technique, a fault-tolerant relaying system is provided without imposing additional overheads. Moreover, it removes the additional load in determining the optimal decision and training the IoT system to balance network cost. In the end, a secure algorithm is proposed to ensure the privacy and

authentication of the relaying system in the presence of critical attacks with secured keys. The proposed model is tested and its performance has significant improvement as compared to existing work.

8)Topic: A Security-enabled Safety Assurance Framework for IoT-based Smart Homes

Author: Sohag Kabir, Prosanta Gope, Saraju P. Mohanty

Published: IEEE Transactions on Industry Applications (Early Access)

Abstract: The exponential growth of the Internet of Things (IoT) has paved the way for safety-critical cyber-physical systems to enter our everyday activities. While such systems have changed the way of our life, they brought new challenges that can adversely affect our life and the environment. Safety and security are two such challenges that can hamper the widespread adoption of new IoT applications. Due to a large number of connected devices and their ability to control critical physical assets, intended attacks on them and/or unintended failure events such as mechanical failure of devices, communication failure and unforeseen bad interactions between connected devices may cause an IoT-based system to enter into unsafe and dangerous physical states. By considering the importance of safety and security of IoT systems, in this article, we present a security-enabled safety monitoring framework for IoT-based systems. In the proposed framework, we utilise design-time system analysis to create an executable monitoring model that enables run-time safety assurance provision for a system via collecting and analysing operational data and evidence to determine the safety status of the system and then taking appropriate actions and securely communicating the safety status and recommended actions to the system users to minimise the risk of the system entering into an unsafe state.

9)Topic: IoT Adoption and Application for Smart Healthcare: A Systematic Review

Author: M Al-Rawashdeh, p Keikhosrokiani, B Belaton.

Abstract: In general, the adoption of IoT applications among end users in healthcare is very low. Healthcare professionals present major challenges to the successful implementation of IoT for providing healthcare services. Many studies have offered important insights into IoT adoption in healthcare. Nevertheless, there is still a need to thoroughly review the effective factors of IoT adoption in a systematic manner. The purpose of this study is to accumulate existing knowledge about the factors that influence medical professionals to adopt IoT applications in the healthcare sector. This study reviews, compiles, analyzes, and systematically synthesizes the relevant data. This review employs both automatic and manual search methods to collect relevant studies from 2015 to 2021. A systematic search of the articles was carried out on nine major scientific databases: Google Scholar, Science Direct, Emerald, Wiley, PubMed, Springer, MDPI, IEEE, and Scopus. A total of 22 articles were selected as per the inclusion criteria. The findings show that TAM, TPB, TRA, and UTAUT theories are the most widely used adoption theories in these studies. Furthermore, the main perceived adoption factors of IoT applications in healthcare at the individual level are: social influence, attitude, and personal inattentiveness. The IoT adoption factors at the technology level are perceived usefulness, perceived ease of use, performance expectancy, and effort expectations. In addition, the main factor at the security level is perceived privacy risk. Furthermore, at the health level, the main factors are perceived severity and perceived health risk, respectively. Moreover, financial cost, and facilitating conditions are considered as the main factors at the environmental level. Physicians, patients, and health workers were among the participants who were involved in the included publications. Various types of IoT applications in existing

studies are as follows: a wearable device, monitoring devices, rehabilitation devices, telehealth, behavior modification, smart city, and smart home. Most of the studies about IoT adoption were conducted in France and Pakistan in the year 2020. This systematic review identifies the essential factors that enable an understanding of the barriers and possibilities for healthcare providers to implement IoT applications. Finally, the expected influence of COVID-19 on IoT adoption in healthcare was evaluated in this study.

10)Topic: Progress of Advanced Devices and Internet of Things Systems as Enabling Technologies for Smart Homes and Health Care

Author: O Shi, Y Yang, Z Sun, C Lee.

Published: IEEE Transactions on Industry Applications (Early Access)

Abstract: The exponential growth of the Internet of Things (IoT) has paved the way for safety-critical cyber-physical systems to enter our everyday activities. While such systems have changed the way of our life, they brought new challenges that can adversely affect our life and the environment. Safety and security are two such challenges that can hamper the widespread adoption of new IoT applications.