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VEHICLE CONTROL USING IOT

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ABSTRACT

Presently our generation is leading the technological developments on a huge scale. Development of certain technologies which are helpful to solve the problem arising due heavy population growth, multiple industrial problems to huge production demand, pollution growth problems, mass construction growth etc.., which result in implementation of smart cities, smart enhanced products, autonomous vehicles, transportation portals using embedded systems, multiple industrial embedded systems. Now, all these mentioned systems can be possible only on data transferring at high rate this data transferring and processing can be only possible by using it as a major thing. As we know that it is based the network of physical objects— "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. Vehicle controlling using iot is system of implementing smart parking system, autonomous control using mobile, voice assistant control etc. integrated automobile is a sophisticated technology and the features available in this system will help all the needs the present generation is looking for if we go through the IOT platform is totally connection of different system designed to do different works.so, by merging all the system and help them to transfer data among themselves will be creation of an perfect embedded device with high accuracy, perfection.

Now the chosen vehicle control is totally linked with this iot platform all working system responsible different purposes in an automobile can be controlled like fuel consumption, collision avoidance system for parking, adaptive cruise control for smooth ride, engine management system etc.., likewise all these different things are controlled on a platform using iot like by using a mobile application, Bluetooth system, voice assistant, remote sensor. This is possible by connecting the automobile system with different sensors all the date form engine management system is received all shared with an analysis format of instructions.

INTRODUCTION

These new application possibilities not only improve the overall resource management and utilization by providing idle resources as utility, but also enable research and development of newer applications, thus enhancing the overall services infrastructure for intelligent transportation systems (ITS) in smart cities.

--There are a wide variety of services as well as applications offered through VANETs, IoT, and VC that add value to daily lives by providing consolation, improved accessibility, and overall citizenship as well as asset security and safety.

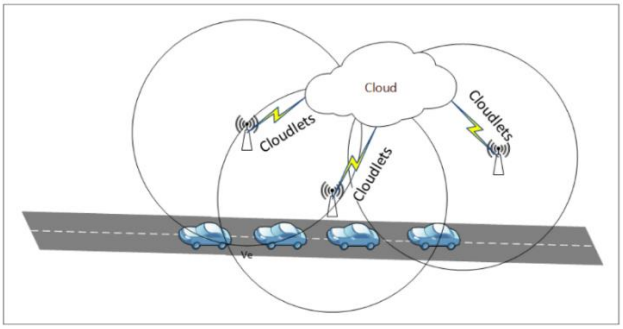

FIG: -1. Vehicular clouds meet the Internet of Things, enabling smart cities to leverage vehicular fog computing

Various applications and service infrastructures have been realized through leveraging IoT. Android, as a significant device management platform, has been a pivotal force in realizing numerous applications for smart cities.

2.1: INTEGRATED SERVICES OVER VCOT STANDARDS AND PROTOCOL

The proposed vehicular cloud architecture consists of different types of entities such as vehicles equipped with onboard units (OBUs), infrastructural components such as RSUs, and management authorities responsible for registration, monitoring, and control of vehicles connected to the cloud.

2.2: ARCHITECTURAL FRAMEWORK

The goal of integration through our proposed generalized infrastructural framework for Cot is to ensure that the nodes from vehicular networks enabled with VC and IoT qualify ed smart city applications share data and interact in a very seamless way for service data exchange and enhanced user experience. There are three main parts of such integration: IoT infrastructure, middleware components, and the vehicular cloud paradigm.

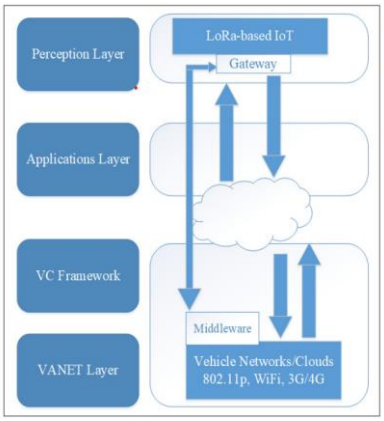

FIG: -2. Layer design for VCoT connecting IoT with VANET for service enhancements

2.3: WORKING OF IOT

The E-VMS is also familiar with the GPS system. This will allow the E-VMS to maintain track of the cars' location in real time. This information will be used to locate the car in the event of an accident or theft. The E-VMS system's results were promising in terms of accurately identifying accidents, determining the severity of the accident, and determining the position of the vehicle.

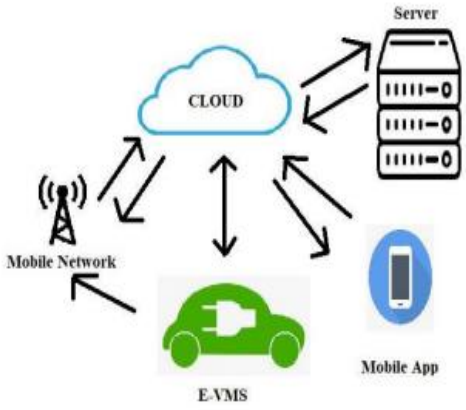

FIG: -3. Car connected to the IOT application

Now, all these mentioned systems can be possible only on data transferring at high rate this data transferring and processing can be only possible by using iot as a major thing. As we know that iot is based the network of physical objects— “things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. Vehicle controlling using iot is system of implementing smart parking system, autonomous control using mobile, voice assistant control etc.,

CONTROLLING FEATURES OF VEHICLE

1.OBSTACLE AVOIDANCE: -

In this case, the robot car moves along using the Obstacle avoiding. The ultrasonic sensor is mainly used for this purpose. Study the previous articles for more information.

2.BLUETOOTH CONTROL

In this case, we can control the robot through an app on the smartphone. The Bluetooth module is used for this.

3.VOICE CONTROL

In this case, we can control this robot using several voice commands. This also requires a Bluetooth module and mobile app.

BASIC DESIGN AND ARCHITECTURE:

- ✓ Basic sensors, controllers, modules etc.,
- ✓ Design created by using CAD/CAE.
- ✓ Basic importance of GPS/GSM modules.
- ✓ Image processing danger detection algorithm.
- ✓ Microcontroller like Arduino, Raspberry etc.,

The inverter then transmits a specified quantity of electrical energy to the motor when the controller is set. Electrical energy is converted into mechanical energy by an electric motor. The gearbox spins while the motor rotor turns, causing the wheels to revolve and the automobile to drive.

LITERATURE REVIEW

Efficient and trusted autonomous vehicle routing protocol for 6G networks with computational intelligence

The Internet of Things (IoT) and wireless sensors have collaborated with many real-time environments for the collection and processing of physical data. The sixth generation (6G) technologies provide support for emerging applications using Connected and Autonomous Vehicles (CAV) and observe critical conditions. However, there are numerous research obstacles in terms of data delivery and transmission latency due to the unpredictable environment and changing states of IoT sensors.

This work presents an efficient and trusted autonomous vehicle routing protocol using 6G networks, which aims to guarantee high quality of service and data coverage.

Firstly, the proposed protocol establishes a routing process using a simulated annealing optimization technique and improves energy optimization between IoT based vehicles, and under difficult circumstances, it statistically guarantees the optimal solution.

Secondly, it provides a risk-aware security system due to reliable session-oriented communication with network edges among connected vehicles and avoids uncertainties in the autonomous system.

The proposed protocol is verified using simulations for varying vehicles and varying iterations that indicates a green communication system for the autonomous system with authenticity and system intelligence.

DESIGN OF AUTONOMOUS VEHICLE CONTROL USING IOT

In this paper a prototype autonomous vehicle system is explained. A car has been driven by the internet to be more secure.

There are three types of detection like Traffic light detection, Obstacle detection and Lane detection. It is the main theme of this project

The main purpose of this concept is to reduce accidents and human life. The important components are used a Raspberry Pi, a Pi camera, a Web interface and Internet modem.

It is based on Computer vision algorithm. Raspberry Pi is the most important one to construct. The video has been picked and passed through the internet. It is a low cost and very efficient project. Nowadays population has increased drastically due to mobility in public transport has become a challenge in our day-to-day life.

The following Facilitates have been introduced, People have started using a greater number of private transport due to inconvenience caused in the public transport system.

Major factors in public transport are crowd management and ticket issuing system. This work proposed to make an attempt to have a track of passenger's arrival and departure in to bus at a particular point and the number of vacant seats will be displayed.

This would help the public to make a decision on boarding the corresponding transport.

The ticket issuing system through cards which when provided the boarding and departure will automatically deduct the amount and the ticket will be generated.

Also, the number of vehicles arriving at a particular point will also be monitored and the requirement of further vehicles will be intimated to the central control unit.

Real-time statistics on seat availability and bus location will be displayed, as well as communication with passengers. The device also detects the drowsiness and alcohol intake of the driver and unusual behavior is reported to the control office.

Using this information, the Smart Radar is used by the Vehicle Over speeding Detection to estimate the vehicle's speed. This information is gathered and then wirelessly transmitted to the appropriate authorities at a distance via IoT technology. The device includes a GPS sensing module with a transmitter and a receiver that works in tandem with an electronic tracking device to detect the speed of a moving object. This technology logs the vehicle speed in real time and bases its road recognition accuracy on the names of the roads that are placed into Google Maps. The technology computes the vehicle's speed and shows it on an LCD screen. If a vehicle traveling too fast

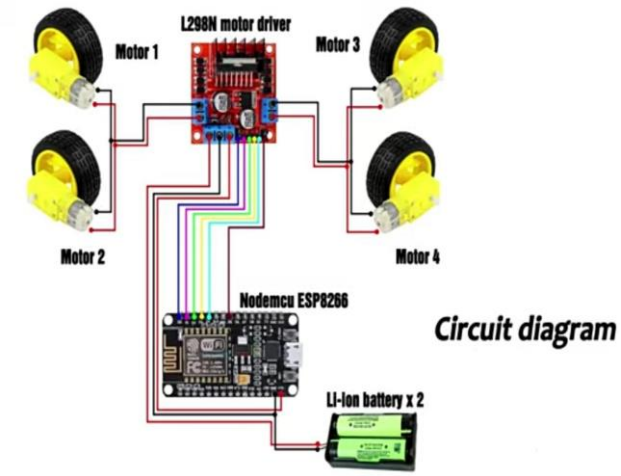

FIG: -4. Connections Circuit for Prototype

The algorithm initially calculates how long it will take a specific vehicle to travel from one location to another.

The Smart Vehicle Monitoring System (SVMS) is suggested in this study as a way to track down accidents and stop thefts. IoT technology is used to access and control the car remotely while also continuously monitoring it. To determine the seriousness of accidents, a machine learning-based picture classification model is used, and a GPS system is used to track the whereabouts of the automobiles. The results were encouraging in terms of accurately identifying accidents, determining their severity, and locating

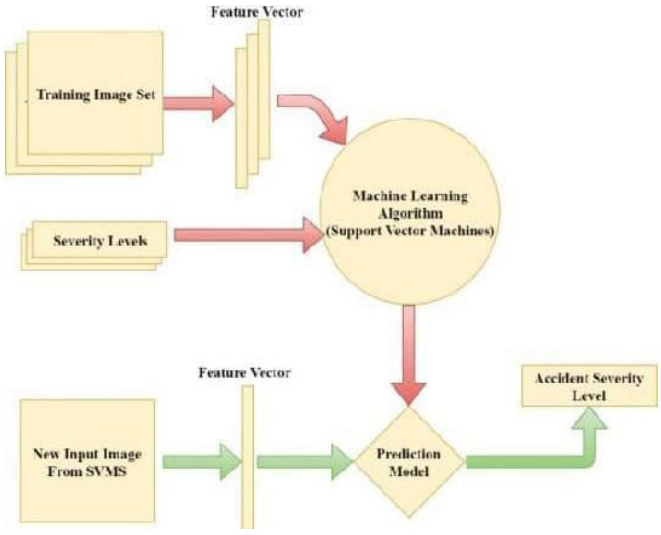

FIG: -5. Accident Severity Detection Model using Machine

One dedicated web and image processing server is part of the SVMS framework.

The machine learning approach used to create the picture classification model employed in this system is depicted The Support Vector Machine (SVM) classifier was used to create the picture categorization model. The SVMS that is here suggested makes use of an enhanced cascade SVM training technique. OpenCV is used in Python to create the cascade SVMS classifier.

Wireless sensor networks are integrated with the Internet of Things (IoT), an emerging trend, to measure numerous vehicle metrics. The position of the vehicle, engine temperature, tire pressure, oil level, speed regulation, and load measurement are all to be monitored using a novel method. The

temperature sensor and load cell of the CC3200 microcontroller are used to track the engine's temperature as well as the vehicle's overall weight. Data collection from numerous sensors, anti-theft control, and vehicle tracking with load computation are all processed in the cloud.

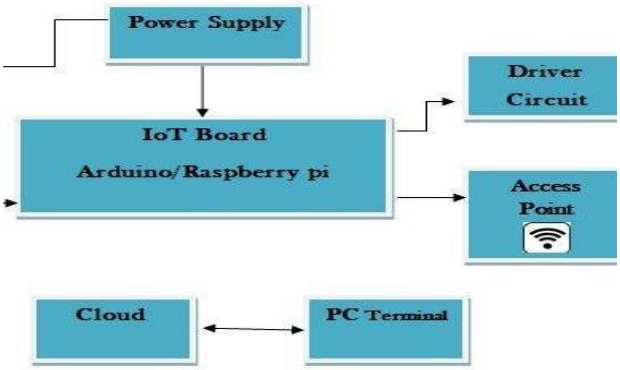

FIG: -6. Overview of the connections

The CC3200's ARM processor transmits data to the signal conditioner, and the cloud offers the logical and physical infrastructure needed to store data. The key benefit of using the cloud is that organizations can instantly access the data from anywhere in the world. The suggested device emits a buzzer signal to authorities if it detects an over speeding car. Based on connectivity and internet speed, the speed tracking accuracy predicted by the Speed App employing radar ranges from 40 to 80%.

IOT BASED SMART VEHICLE MONITORING SYSTEM

- The SVSM was not a simple system but a framework to immediately detect accidents with severity.
- SVMS also helps the user to remotely shutdown the vehicle during theft.
- It also allows the user to locate the vehicle position from anywhere in the world.
- The SVMS includes Raspberry Pi accompanied by different sensors, GSM/GPRS module and GPS module.
- Raspberry Pi also equipped with a camera to capture the driver image, when an accident happens.
- Then the image will be sent to the server that will process the image and find the severity of the accident by machine learning and image classification.
- The location of the accident can be detected with the equipped GPS module.
- When the vehicle was stolen, the users can shut down the vehicle's fuel system by simply clicking a button in the web user interface.
- Fuel relay switch in the vehicle is connected to raspberry pi to allow the user to remotely shutdown the vehicle.
- Using the Internet of Things (IoT) and cloud computing, an experimental examination of the Intelligent Vehicle Monitoring System (IVMS) is created.
- The suggested system is built on a cloud computing architecture and includes sensors that can track the vehicle's speed, position, engine temperature, battery health, tire pressure, anti-theft, load weight, and brake system.
- The suggested device emits a buzzer signal to authorities if it detects an over speeding car. Based on connectivity and internet speed, the speed tracking accuracy predicted by the Speed App employing radar ranges from 40 to 80%.

DEVELOPMENT OF IOT BASED VEHICULAR POLLUTION MONITORING SYSTEM

- IoT has become helpful in cities for monitoring air pollution from vehicles and also data related to the amount of pollution on different roads of a city can be gathered and analyzed.
- IoT has unique addressable things and their virtual illustration on an internet like structure.
- The designed smart intelligent environmental system monitors the pollutants produced by the vehicles and also warn the vehicle owners to control the pollution.
- The system also sends the pollutant level data to the server for future analysis.
- The air pollution agencies are able to analyze the data and also detect the vehicle registration numbers that cause more pollution in the atmosphere.
- If any vehicle exceeds the permissible pollution level, then a message is sent to the vehicle owner that advises the pollution level of the vehicle and also penalty for causing pollution.
- The developed system is low cost, simple to operate and is easily inserted in any location.
- The developed system provides better accuracy with low cost than the existing system.
- This study addresses the issue of conducting precise vehicle overspeed detection in urban environments using IoT technologies to support growing vehicular There are applications discussed.

- Future improvements that could be made to the suggested system through creating hardware implantations, integrating sensors, and creating software algorithms.

AN ATTEMPT TO DEVELOP AN IOT BASED VEHICLE SECURITY SYSTEM

- The Internet of things is expected to produce a high degree of human to machine communication along with machine-to-machine communication.
- This system is controlled by an RFID module to switch on and off.
- GPS (Global Positioning System) stores the latitude and longitude information it collects in the E2 PROM chip.
- When thieves get into the car, the vibration sensors mounted in the doors will be triggered.
- The GPS plays a major role with wireless communication for extracting the relevant information.
- It must keep the vehicle secured by notifying the user via SMS in case of any unauthorized access, theft, intrusion, and towing.
- This IOT based advanced vehicle system enables user safety by seat belt compulsion, keyless locking /unlocking system to operate the car.
- IOT based advanced vehicle systems offer utmost efficiency, convenience, safety & reliability.
- The SVMS can be used to detect accidents, alert the appropriate authorities, lessen the number of fatalities and serious injuries from accidents, and reroute traffic.
- Two sets of training photos were used to train the image classification model, however more complicated data sets are required.
- The Smart Vehicle Monitoring System (SVMS) is suggested in this study as a way to track down accidents and stop thefts. IoT technology is used to access and control the car remotely while also continuously monitoring it.

APPLICATIONS OF CR-BASED IOT

- Healthcare: We have healthcare applications of IoT already in the practical domain. Smart sensors are deployed on and around a patient to monitor critical data such as temperature, blood pressure, glucose level, and others
- Social Activities: CR-based IoT has drawn attention in social activities. One example is intelligent transportation systems (ITS), which incorporate road and vehicle-based sensors for multiple applications.
- Environment Related Applications: IoT-based applications in the environmental domain are already in progress with great interest
- In-Home Applications: IoT-based solutions are already in the working domain inside a home/ building, and it is envisioned that with the evolution in technology, the era of IoT will be a necessity in the future.
- Smart Grid: Smart grid is an emerging paradigm nowadays. Consumers want to know anything at any time and at any place related to their energy consumption.

INTERNET OF THINGS AND RELATED FUTURE TECHNOLOGIES

Cloud Computing

The two worlds of Cloud and IoT have seen a rapid and independent evolution. These worlds are very different from each other, but their characteristics are often complementary in general, in which IoT can benefit from the virtually unlimited capabilities and resources of cloud to compensate its technological constraints for example storage, processing, and communication

Big Data

Due to the rapid expansion in the networks nowadays, the number of devices and sensors in networks are increased more and more in the physical environments which will change the information communication networks, services and applications in various domains.

Security and Privacy

Due the fact that IoT applications able to access the multiple administrative domains and involve to multiple ownership regimes, there is a need for a trust framework to enable the users of the system to have confidence that the information and services being exchanged can indeed be relied upon.

Distributed Computing

Distributed computing uses groups of networked computers for the same computational goal. Distributed Computing has several common issues with concurrent and parallel computing, as all these three falls in the scientific computing field.

IOT CHALLENGES

– ***Scalability:*** Internet of Things has a big concept than the conventional Internet of computers, because of things are cooperated within an open environment. Basic functionality such as communication and service discovery therefore need to function equally efficiently in both small scale and large-scale environments.

– ***Self-Organizing:*** Smart things should not be managed as computers that require their users to configure and adapt them to particular situations.

– ***Data volumes:*** Some application scenarios of the internet of things will involve to infrequent communication, and gathering information's form sensor networks, or form logistics and large-scale networks, will collect a huge volume of data on central network nodes or servers.

– ***Data interpretation:*** To support the users of smart things, there is a need to interpret the local context determined by sensors as accurately as possible.

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– ***Software complexity:*** A more extensive software infrastructure will be needed on the network and on background servers in order to manage the smart objects and provide services to support them

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CONCLUSION

- The integration of IoT with VANETs is a promising domain where we can leverage vehicular clouds for disseminating information from the vehicular domain to the IoT domain. In this article, we have proposed and evaluated an abstract-level generic framework, integrated with Cot, for overall service enhancements in smart cities.
- The need for cognitive radio networks for IoT. Both technologies are in early stages, but very little work has been done in IoT. Consequently, realizing CR-based IoT is still a new paradigm and needs to be studied in detail.
- Internet of things is a new technology which provides many applications to connect the things to things and human to things through the internet. Each object in the world can be identified, connected to each other through internet taking decisions independently.
- Internet of things may face two major challenges in order to guarantee seamless network access; the first issue relates to the fact that today different networks coexist and the other issue is related to the big data size of the IoT

REFERENCES

1. Alagarsamy, M., Kasinathan, P., Manickam, G., Duruvarajan, P. R., Sakkarai, J., & Suriyan, K. (2022). IoT based E-vehicle monitoring system using sensors and imaging processing algorithm. Int J Reconfigurable & Embedded Syst ISSN, 2089(4864), 4864.
2. Shirbhate, J., Buradkar, B., Parate, N., Gaurkhede, P., Yende, S., & Dekate, R. A REVIEW PAPER ON SPEED CONTROL & MONITORING OF INDUCTION MOTOR USING IOT.
3. Bhuvaneswari, G., & Manikandan, G. (2022). A Smart Speed Governor Device For Vehicle Using Iot. Webology (ISSN: 1735-188X), 19(2).
4. Hosny, K. M., Magdi, A., Salah, A., El-Komy, O., & Lashin, N. A. (2023). Internet of things applications using Raspberry-Pi: a survey. International Journal of Electrical & Computer Engineering (2088-8708), 13(1).
5. Le Gall, G., Montavont, N., & Papadopoulos, G. Z. (2022). IoT Network Management within the Electric Vehicle Battery Management System. Journal of Signal Processing Systems, 94(1), 27-44.
6. Mallidi, S. K. R., & Vineela, V. V. (2018). IoT based smart vehicle monitoring system. International Journal of Advanced Research in Computer Science, 9(2), 738-741.
7. Khan, M. A., & Khan, S. F. (2018, April). IoT based framework for Vehicle Over-speed detection. In 2018 1st International Conference on Computer Applications & Information Security (ICCAIS) (pp. 1-4). IEEE.
8. Alagarsamy, M., Kasinathan, P., Manickam, G., Duruvarajan, P. R., Sakkarai, J., & Suriyan, K. (2022). IoT based E-vehicle monitoring system using sensors and imaging processing algorithm. Int J Reconfigurable & Embedded Syst ISSN, 2089(4864), 4864.
9. Hu, Z., & Tang, H. (2022). Design and Implementation of Intelligent Vehicle Control System Based on Internet of Things and Intelligent Transportation. Scientific Programming, 2022, 1-11.
10. Ramson, S. J., Vishnu, S., & Shanmugam, M. (2020, March). Applications of internet of things (iot)–an overview. In 2020 5th international conference on devices, circuits and systems (ICDCS) (pp. 92-95). IEEE.
11. Manjunathan, A., Kumar, A. S., Udhayanan, S., Selvi, C. T., & Stonier, A. A. (2021, February). Design of autonomous vehicle control using IoT. In IOP Conference Series: Materials Science and Engineering (Vol. 1055, No. 1, p. 012008). IOP Publishing.
12. Rushikesh, R., & Sivappagari, C. M. R. (2015, October). Development of IoT based vehicular pollution monitoring system. In 2015 international conference on green computing and internet of things (ICGCIoT) (pp. 779-783). IEEE.
13. R. Hussain, Z. Rezaeifar, and H. Oh, "A Paradigm Shift fromVehicular Ad Hoc Networks to Vanet-Based Clouds," Wireless Personal Commun., vol. 83, no. 2, 2015, pp. 1131–58.
14. R. Hussain et al., "Secure and Privacy-Aware Traffic Information as a Service in VANET-Based Clouds," Pervasive and Mobile Computing, Special Issue on Secure Ubiquitous Computing, vol. 24, 2015, pp. 194–209.

15. D. Kwak et al., “Seeing is Believing: Sharing Real-Time Visual Traffic Information via Vehicular Clouds,” IEEE Access, vol. 4, 2016, pp. 3617–31.
16. Al-Fuqaha et al., “Internet of Things: A Survey on Enabling Technologies, Protocols, and Applications,” IEEE Commun. Surveys & Tutorials, vol. 17, no. 4, Fourthquarter 2015, pp. 2347–76.
17. F. Qu et al., “A Security and Privacy Review of VANETs,” IEEE Trans. Intelligent Transportation Systems, vol. 16, no. 6, Dec. 2015, pp. 2985–96.
18. M. Nia and N. K. Jha, “A Comprehensive Study of Security of Internet-of-Things,” IEEE Trans. Emerging Topics in Computing, 2016.
19. Celesti et al., “An IoT Cloud System for Traffic Monitoring and Vehicular Accidents Prevention Based on Mobile Sensor Data Processing,” IEEE Sensors J., vol. 18, no. 12, June 2018, pp. 4795–4802.
20. K. Mikhaylov, . J. Petaejaejaervi, and T. Haenninen, “Analysis of Capacity and Scalability of the Lora Low Power Wide Area Network Technology,” Proc. European Wireless 2016, May 2016, pp. 1–6.
21. H. A. Khattak, R. Hussain, and Z. Ameer, “Internet of Vehicles: Integrated Internet of Things Services over Vehicular Ad Hoc Networks,” Proc. Smart Societies, Infrastructure, Technologies, and Applications 2017, Springer, June 2018,pp. 1–7
22. S. Mallissery et al., “Transport and Traffic Rule Violation Monitoring Service in ITS: A Secured VANET Cloud Application,” Proc. 2015 12th Annual IEEE Consumer Communications and Networking Conf., Jan 2015, pp. 213–18.
23. W. He, G. Yan, and L. D. Xu, “Developing Vehicular Data Cloud Services in the IoT Environment,” IEEE Trans. Industrial Informatics, vol. 10, no. 2, May 2014, pp. 1587–95.
24. A. Siddiqa et al., ”Social Internet of vehicles: Complexity Adaptivity Issues and Beyonds,” IEEE Access, vol. 6, 2018, pp. 62,089–62,106.
25. N. B. Truong, G. M. Lee, and Y. Ghamri-Doudane, “Software Defined Networking-Based Vehicular Adhoc Network with Fog Computing,” Proc. 2015 IFIP/IEEE Int’l. Symp. Integrated Network Management, 2015, pp. 1202–07.
26. O. A. Khan et al., ”Leveraging Named Data Networking for Fragmented Networks in Smart Metropolitan Cities,” IEEE Access, vol. 6, 2018, pp. 75,899–75,911.
27. J. Lin et al., “A Survey on Internet of Things: Architecture, Enabling Technologies, Security and Privacy, and Applications,” IEEE Internet of Things J., 2017.