International Innovative Research Journal of Engineering and Technology
ISSN: 2456-1983 Vol: 4 No: 3 March 2019

Maximizing the Network Topology Lifetime using Sink Relocation

S.Nageswari[1], S.Navaneetha Krishnan[2]
[1]Department of Computer Science, Bharath Niketan Engineering College, Theni, India
[2]Professor, Department of Electronic and Communication Engineering, SACS MAVMM Engineering College, Madurai
[1]saimonissh@gmail.com, [2]msnk1974@gmail.com

Abstract: Wireless sensor networks, the energy consumption is important one. The sensor hubs are fixed in the static spot or Region of interest (ROI). The sensor hubs are sense the natural parameter and they send the detected information to the sink and sink will do different procedure every sensor node will act as a intermediate In node to each other. Mostly the sensor nodes uses the solar energy for transmission and it will enters into the less network lifetime at night time due to the unavailability of energy because the energy gets drained at the day time. In this project, it concentrating about the network lifetime with respect to the energy consumption. In this project the sink relocation approach is proposed, which should be possible dependent on the problem area identification and distinguishing the vindictive hub for expelling it. Here it monitors the residual battery energy of each sensor for hotspot detection. The presence of Malicious node is informed to all other nodes in that range to beware all the other nodes to avoid communicating it.

Keywords: Sink Relocation, ROI, WSN, Nodes.

1. INTRODUCTION

The WSN is worked of "hubs" – from a couple to a few hundreds or even thousands, where every hub is associated with one (or now and then a few) sensors [1-5]. Each such sensor organize hub has normally a few sections: a radio handset with an inward recieving wire or association with an outside reception apparatus, a microcontroller, an electronic circuit for interfacing with the sensors and a vitality source, ordinarily a battery or an inserted type of vitality collecting.

A sensor hub may differ in size from that of a shoebox down to the extent of a grain of residue, albeit working "bits" of authentic minute measurements still can't seem to be made. The expense of sensor hubs is correspondingly factor, running from a couple to many dollars, contingent upon the unpredictability of the individual sensor hubs. A sensor hub, otherwise called a bit is a hub in a sensor arrange that is fit for playing out some preparing, gathering tangible data and speaking with other associated hubs in the system. A bit is a hub yet a hub isn't generally a bit.

2. EXISTING SYSTEM

The "big data" developed as a hotly debated issue on account of the colossal development of the Information and Communication Technology (ICT).

One of the profoundly foreseen key patrons of the enormous information later on systems is the disseminated Wireless Sensor Networks (WSNs). In spite of the fact that the information created by an individual sensor may not seem, by all accounts, to be critical, the general information produced over various sensors in the thickly appropriated WSNs can deliver a noteworthy bit of the big data [2-10].

Vitality productive huge big data assembling in the thickly conveyed sensor systems is, in this way, a difficult research region. A standout amongst the best answers for location this test is to use the sink hub's versatility to encourage the information gathering. While this strategy can decrease vitality utilization of the sensor hubs, the utilization of versatile sink displays extra difficulties, for example, deciding the sink hub's direction and group development preceding information gathering. In this undertaking, we propose another versatile sink steering and information gathering strategy through system bunching dependent on adjusted Expectation-Maximization (EM) procedure.

Also, we infer an ideal number of bunches to limit the vitality utilization. While the ordinary portable sink plans can decrease vitality utilization of the sensor hubs, they lead to some of extra difficulties, for example, deciding the sink hub and group development preceding information accumulation. To address these difficulties, we proposed a portable sink based information

Copyright © 2019 Mélange Publications

International Innovative Research Journal of Engineering and Technology
ISSN: 2456-1983 Vol: 4 No: 3 March 2019

accumulation strategy by presenting another bunching technique. [3-15]Our grouping strategy depends on a changed Expectation-Maximization procedure.

In existing system, it has a mechanism of sink relocation with random location. In that mechanism the sink is relocated only when the hotspot is detected. If the hotspot is detected means, the sink is relocated to a random place and the sink will receives the sensed data from the sensor node.

The existing system has the following disadvantages as IT consumes more energy. Life time of node is not maintained as well. The delay is more due to the speed of sink relocation (i.e.), switching of sink. The detected hotspot makes path failure due to the lack of energy. It degrades the network lifetime. The delay is more due to the speed of sink relocation (i.e.), switching of sink.

3. PROPOSED SYSTEM

To overcome the drawbacks of the existing system this project approaches the sink relocation before the hotspot detection by monitoring the residual energy of each sensor node. It also Increases the speed of the switching time and reduces the delay. The malicious node attack can be protected by the grade based approach. Remaining nodes are protected by providing the information about the malicious node.

In this proposed the sink migration approach is proposed, which should be possible dependent on the problem area location and distinguishing the malevolent hub for evacuating it[5]. Our task consolidates the highlights of vitality mindful transmission run convention and sinks movement component.

A.1 Sink Relocation

In general, WSNs can be characterized into two classes, stationary and re-locatable WSNs, contingent upon whether the hubs are fit for moving or not. At the point when a stationary WSN is conveyed in a detecting field [4-20], every sensor hub situates at a fixed position to perform all around of detecting and message detailing/transferring undertakings until a sensor hub (or a bit of the sensor hubs) channel out their battery vitality; at that point the WSN bites the dust. For the class of re-locatable WSNs, sensor hubs or the sink are equipped for moving. A few research works have proposed instruments for the sink migration approach.

A.2 Block diagram

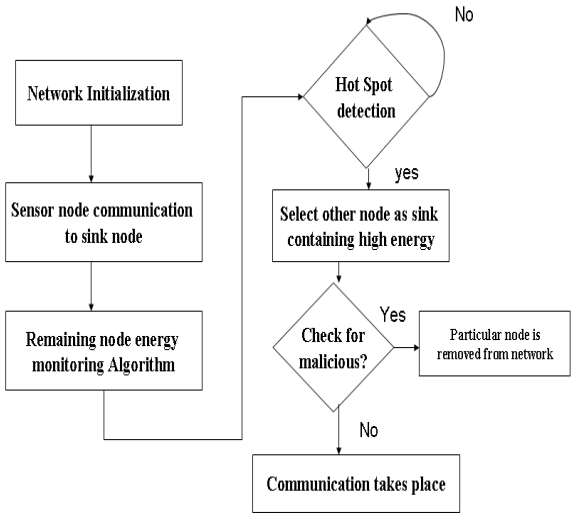

Figure 1. Block diagram of proposed system

From fig.1, the network is initialized by initiating the number of nodes, topology and type of connection. The network is ready for communication [21-30]. The Communication takes place between the sensor nodes to the sink node. The sink will collect all the information from the network and provide it to the sensor node. The energy consumed by the sink will be more when compared to the energy level of other nodes. Hence, it is necessary to monitor the energy level of remaining nodes by this it is possible to avoid network drain out. The remaining node energy will monitor for energy level of sink node. If the sink node energy decreases below the threshold range means it will choose the neighbor node with more energy as sink node. Once the communication is started it will check for the presence of malicious node.

A. 3 Communication

The Communication takes place between the sensor nodes to the sink node. The sink will collect all the information from the network and provide it to the sensor node.

A.4 Remaining Node Energy Monitoring algorithm:

The energy consumed by the sink will be more when compared to the energy level of other nodes. Hence, it is necessary to monitor the energy level of remaining nodes by this it is possible to avoid network drain out. This algorithm will choose the neighbor node with more energy level than the sink node and assume it as sink node. Hence the new sink will be used for communication until it reaches certain threshold level. By this way the dying of network is avoided.

Copyright © 2019 Mélange Publications

International Innovative Research Journal of Engineering and Technology
ISSN: 2456-1983 Vol: 4 No: 3 March 2019

A.5 Hot spot detection

The remaining node energy will monitor for energy level of sink node. If the sink node energy decreases below the threshold range means it will choose the neighbor node with more energy as sink node. Otherwise, it will continuously monitor for energy level.

A.6 Checking for malicious node

Once the communication is started it will check for the presence of malicious node. If malicious node is node detected means, then that particular node will be eliminated from the network. Otherwise, the communication will takes place.

A.7. Software used

Language used : OTCL (Object Tool Command Language)
Simulation Tool : Gedit, Cygwin

A.8 Hardware description

The hardware used include: PIC a microcontroller, RFM transceiver via MAX232.
The software used include: OTCL (Object Tool Command Language), Gedit , Cygwin.A.9. Block diagram:

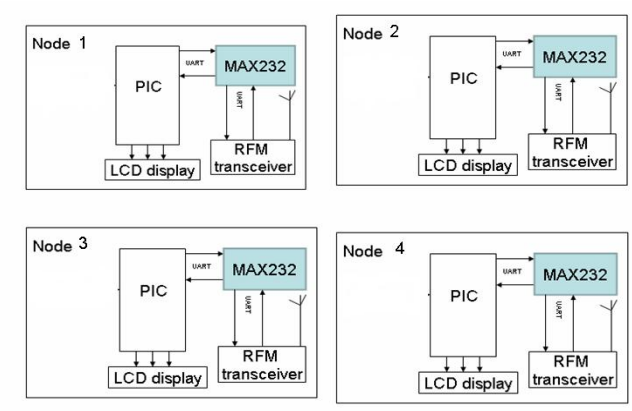

Figure 2. Circuit diagram

From fig.2, the data is given to the PIC.PIC will sense the information from the sensor node and display it on LCD. The signals from PIC are transfer the information to the RFM transceiver via MAX232.RFM transceiver will act as a transmitter and receiver. Hence, any node can transmit and receive within that network. If any node occurs has a hotspot, then sink relocation will be happening. The recevier input hysteresis is normally 0.5V with an ensured least of 0.2V. LCDs are accessible to show discretionary pictures which can be shown or covered up, for example, preset words, digits, and 7-section shows as in a computerized clock. The MAX232 is an IC, that changes over sign from a RS-232 sequential port to signals reasonable for use in TTL perfect computerized rationale circuits. These recipients have an ordinary edge of 1.3 V, and a run of the mill hysteresis of 0.5 V.

4. RELATED WORKS

Sensor systems are thick remote systems where data is accumulated by sensor components spread out in an intrigue region. The principle insufficiency of sensors is their limited wellspring of vitality. In this manner, a productive use of this vitality asset conditions the system lifetime. So as to improve the presentation of these systems, some examination endeavors have concentrated on the portability of a solitary or numerous sink hubs. In this undertaking, we propose another unique way to deal with expand the lifetime of a sensor organize dependent on both portability and assortment of sinks. As indicated by the advancement of the system, as far as vitality dispersal and appropriation, this methodology intends to locate the ideal position for every one of the sinks so as to amplify the lifetime of the system and move likewise these sinks in an insightful way.
Every one of the information gathered by a sensor are sent to a sink hub. The position of a sink hub greatly affects the vitality utilization and lifetime of WSNs [36-39]. This venture researches the vitality situated and lifetime-arranged sink hub position techniques in single-sink WSNs, and after that gives the numerical arrangement of lifetime-situated position procedure, which takes both absolute vitality utilization and sensor thickness close to the sink hub into thought. At long last, we assess the exhibition of various situation systems in the systems of non-uniform vitality circulation. Recreation results demonstrate that the systems with lifetime-arranged procedure devour vitality quicker, however have a more drawn out lifetime. Tangible data is imparted to the Base Station through Wireless jump by bounce transmissions. To preserve vitality this data is collected at middle of the road sensor hubs by applying an appropriate total capacity on the got information. The vitality mindful sink migration (EASR) strategy [31-35] gives the most significant exhibition in sink movement work.
The fundamental insufficiency of sensors is their wellspring of vitality. Hence, a proficient usage of this vitality asset conditions the system lifetime. So as to upgrade the exhibition of these systems, some exploration

Copyright © 2019 Mélange Publications

International Innovative Research Journal of Engineering and Technology
ISSN: 2456-1983 Vol: 4 No: 3 March 2019

endeavors have concentrated on the versatility of a solitary or different sink hubs.

The portability of sinks presents a tradeoff between the requirement for successive re-steering to improve the exhibition and the minimization of the overhead coming about because of this topology the board. In this task, we propose another unique way to deal with expand the lifetime of a sensor arrange dependent on both versatility and assortment of sinks.

Our methodology does not endeavor to improve the lifetime of each bunch by migrating each sink in its group however attempts to see the system as a whole and sole element. The assessment of a design depends on a vitality mindful steering calculation which was created.

5. RESULTS AND DISCUSSIONS

B.1 Hardware Diagram

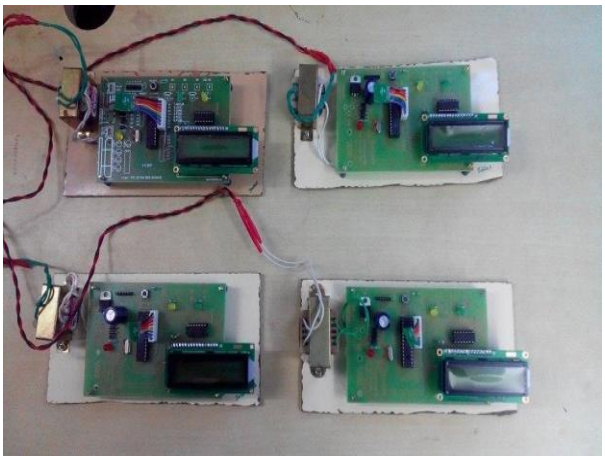

Figure 3. Hardware diagram

B.2 Simulation outputs

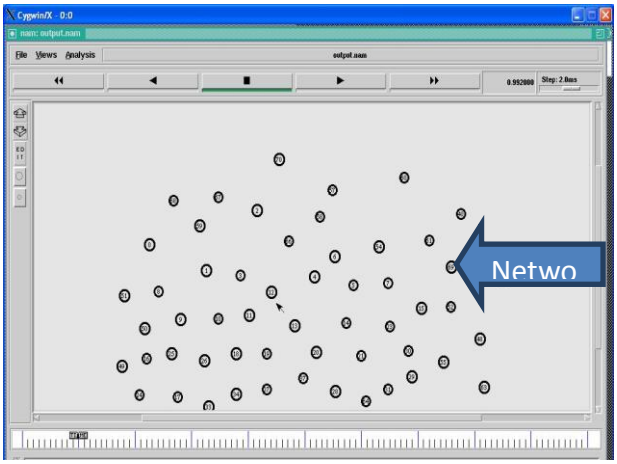

Figure 4. Nodes are created

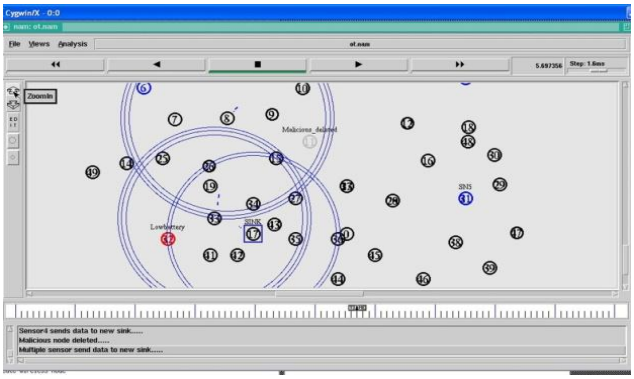

Figure 5. Malicious nodes are detected and removed

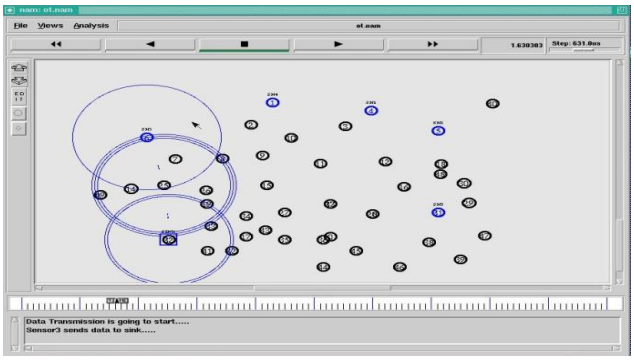

Figure 6. Node communication with sink

.

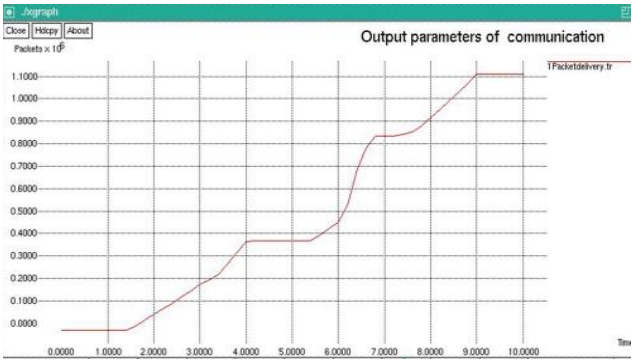

Figure 7. Packet delivery

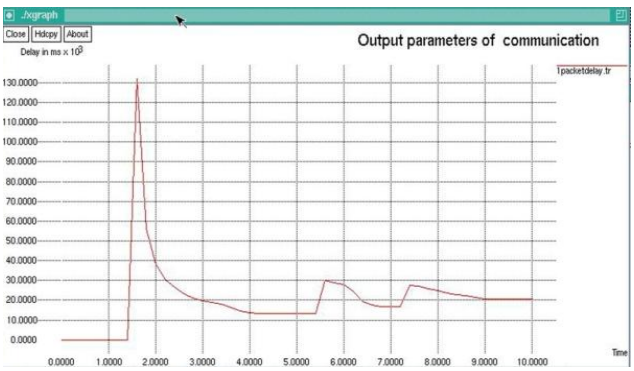

Figure 8. Packet delay

Copyright © 2019 Mélange Publications

International Innovative Research Journal of Engineering and Technology
ISSN: 2456-1983 Vol: 4 No: 3 March 2019

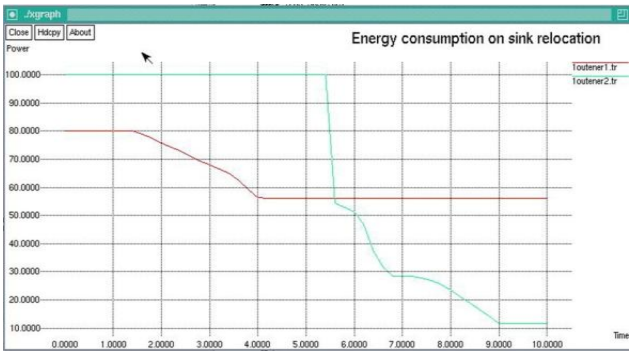

Figure 9. Energy consumption on sink relocation

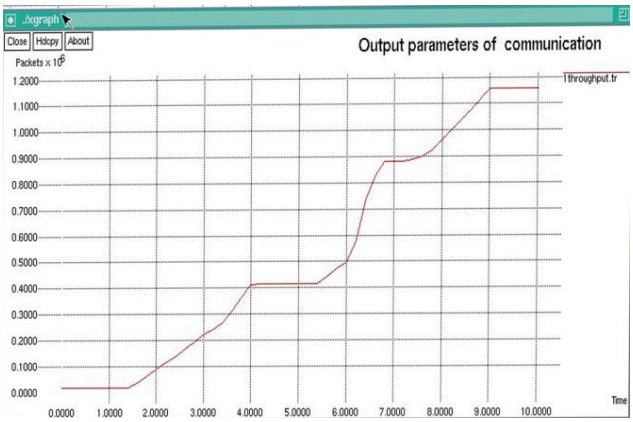

Figure 10. Throughput parameter

6. CONCLUSION AND FUTURE ENHANCEMENTS

In a remote sensor organize (WSN), how to save the constrained power assets of sensors to expand the system lifetime of the WSN to the extent that this would be possible while playing out the detecting and detected information detailing assignments, is the most basic issue in the system plan. In a WSN, sensor hubs convey detected information back to the sink by means of multi-bouncing. The sensor hubs close to the sink will by and large expend more battery control than others; thusly, these hubs will rapidly deplete out their battery vitality and abbreviate the system lifetime of the WSN. Sink migration is a productive system life time expansion technique, which abstains from expending an excessive amount of battery vitality for a particular gathering of sensor hubs. The energy of the nodes are saved by the sink relocating[40]. All the nodes in the range transmit information by the sink node. Sink node will ultimately drain out its energy which cause the wireless sensor network to die. Sink relocation will ultimately save the energy and avoid wireless network to die.

The detection of malicious node is done and informed to all other nodes to be aware and then it is removed. The sink relocation approach is proposed, which can be done based on the hot spot detection and detecting the malicious node for removing it [41]. Here it monitors the residual battery energy of each sensor for hotspot detection. My task consolidates the highlights of vitality mindful transmission run convention and sinks movement instrument. The nearness of vindictive hub which is made because of parcel drop is educated to every single other hub in that range to be careful the various hubs to abstain from imparting it.

REFERENCES

[1] Sivaram, M., B. DurgaDevi, and J. Anne Steffi. "Steganography of two lsb bits." International Journal of Communications and Engineering 1.1 (2012): 2231-2307.

[2] Sivaram, M., et al. "Exploiting the Local Optima in Genetic Algorithm using Tabu Search." Indian Journal of Science and Technology 12 (2019): 1.

[3] Mohammed, Amin Salih, et al. "DETECTION AND REMOVAL OF BLACK HOLE ATTACK IN MOBILE AD HOC NETWORKS USING GRP PROTOCOL." International Journal of Advanced Research in Computer Science 10.6 (2018).

[4] Viswanathan, M., et al. "Security and privacy protection in cloud computing." Journal of Advanced Research in Dynamical and Control Systems (2018): 1704-1710.

[5] Nithya, S., et al. "Intelligent based IoT smart city on traffic control system using raspberry Pi and robust waste management." Journal of Advanced Research in Dynamical and Control Systems, Pages (2018): 765-770.

[6] Dhivakar, B., et al. "Statistical Score Calculation of Information Retrieval Systems using Data Fusion Technique." Computer Science and Engineering 2.5 (2012): 43-5.

[7] Mohammed, Amin Salih, Shahab Wahhab Kareem, and M. Sivaram. "Time series prediction using SRE-NAR and SRE-ADALINE." (2018): 1716-1726.

[8] V. Manikandan, Dr.D. Yuvaraj, Amin Salih Mohammed, V. Porkodi and Dr.M. Sivaram. "ELECTRICAL ENERGY CONSERVATION AND ENERGY MANAGEMENT SYSTEM USING INTERNET OF THINGS." (2018): 2016-2023.

[9] Porkodi.V, Yuvaraj.D., Mohammed,A.S, Sivaram.M and Manikandan.V. "IoT in Agriculture." (2018): 1986-1991.

Copyright © 2019 Mélange Publications

[10] .Manikandan.V, Mohammed, A.S, Yuvaraj,D., Sivaram.M and Porkod.V. “An Energy Efficient EDM-RAEED Protocol for IoT Based Wireless Sensor Networks.” (2018): 1992-2004.

[11] Dr.Amin Salih Mohammed, Suzan Tahsein Husein, Dr. M.Sivaram, V. Porkodi and V.Manikandan. “4G and 5G Communication Networks Future Analysis” (2019): 343-349.

[12] Abraham, Steffin, Tana Luciya Joji, and D. Yuvaraj. "Enhancing Vehicle Safety with Drowsiness Detection and Collision Avoidance." International Journal of Pure and Applied Mathematics 120.6 (2018): 2295-2310.

[13] Porkodi, V., et al. "Survey on White-Box Attacks and Solutions." Asian Journal of Computer Science and Technology 7.3 (2018): 28-32.

[14] Malathi, N., and M. Sivaram. "An Enhanced Scheme to Pinpoint Malicious Behavior of Nodes In Manet’s." (2015).

[15] Sivaram, M. "Odd and even point crossover based Tabu ga for data fusion in Information retrieval." (2014).

[16] Sivaram, M., et al. "Emergent News Event Detection from Facebook Using Clustering."

[17] Punidha, R. "avithra K, Swathika R, and Sivaram M,“Preserving DDoS Attacks sing Node Blocking Algorithm.” International Journalof Pure and Applied Mathematics, Vol. 119, o. 15, 2018." 633-640.

[18] Batri, K., and M. Sivaram. "Testing the impact of odd and even point crossover of genetic algorithm over the data fusion in information retrieval." European Journal of Scientific Research (2012).

[19] Mohamme, Sivaram Yuvaraj Amin Salih, and V. Porkodi. "Estimating the Secret Message in the Digital Image." International Journal of Computer Applications 181.36 (2019): 26-28.

[20] Manikandan, V., et al. "PRIVACY PRESERVING DATA MINING USING THRESHOLD BASED FUZZY CMEANS CLUSTERING." ICTACT Journal on Soft Computing 9.1 (2018).

[21] Obulatha-II-ME-CSE, Miss O. "Position Privacy Using LocX."

[22] Sivaram, M., et al. "The Real Problem Through a Selection Making an Algorithm that Minimizes the Computational Complexity."

[23] Sivaram, M., et al. "DETECTION OF ACCURATE FACIAL DETECTION USING HYBRID DEEP CONVOLUTIONAL RECURRENT NEURAL NETWORK."

[24] V. Porkodi, Dr.D. Yuvaraj, Dr. Amin Salih Mohammed, V. Manikandan and Dr.M. Sivaram. “Prolong the Network Lifespan of WirelessSensor Network” (2018): 2034-2038.

[25] M, Sivaram, ENABLING ANONYMOUS ENDORSEMENT IN CLOUDS WITH DECENTRALIZED ACCESS CONTROL (March 13, 2019). Available at SSRN: https://ssrn.com/abstract=

[26] M, Sivaram, INTEGER WAVELET TRANSFORM BASED APPROACH FOR HIGH ROBUSTNESS OF AUDIO SIGNAL TRANSMISSION (March 13, 2019). Available at SSRN: https://ssrn.com/abstract=

[27] M, Sivaram, HEALTHCARE VISIBLE LIGHT COMMUNICATION (March 13, 2019). Available at SSRN: https://ssrn.com/abstract=

[28] M, Sivaram, Preserving DDoS Attacks Using Node Blocking Algorithm (March 13, 2019). Available at SSRN: https://ssrn.com/abstract=

[29] M, Sivaram and Sivaram, Porkodi and manikandan, V, Securing the Sensor Networks Along With Secured Routing Protocols for Data Transfer in Wireless Sensor Networks (OCTOBER 28, 2018). Available at SSRN: https://ssrn.com/abstract=

[30] M, Sivaram, Statistical Score Calculation of Information Retrieval Systems using Data Fusion Technique (April 8, 2019). Available at SSRN: https://ssrn.com/abstract=

[31] Yuvaraj, Duraisamy, and Shanmugasundaram Hariharan. "Content-based image retrieval based on integrating region segmentation and colour histogram." learning 2.11 (2016): 12.

[32] ShanmugaPriya, S., A. Valarmathi, and D. Yuvaraj. "The personal authentication service and security enhancement for optimal strong password." Concurrency and Computation: Practice and Experience: e5009.

[33] Ahamed, B. Bazeer, and D. Yuvaraj. "Framework for Faction of Data in Social Network Using Link Based Mining Process." International Conference on Intelligent Computing & Optimization. Springer, Cham, 2018.

[34] Santhi, R., and D. Yuvaraj. "Content-Based Image Retrieval in Cloud Using Watermark Protocol and Searchable Encryption." (2017).

Copyright © 2019 Mélange Publications

[35] Karthika, M., K. Geetha, and D. Yuvaraj. "Preserving Location Based Range Query over Outsourced Data with EPLQ Using LOCX."

[36] Santhi, R., and D. Yuvaraj. "Content-Based Image Retrieval in Cloud Using Watermark Protocol and Searchable Encryption." (2017).

[37] Yuvaraj, Duraisamy, and Shanmugasundaram Hariharan. "Efficient Content Based Image Retrieval Technique using Multiple Attributes." (2013).

[38] Sivaram M., Mohammed A.S., Yuvaraj D., Porkodi V., Manikandan V., Yuvaraj N. (2019) Advanced Expert System Using Particle Swarm Optimization Based Adaptive Network Based Fuzzy Inference System to Diagnose the Physical Constitution of Human Body. In: Somani A., Ramakrishna S., Chaudhary A., Choudhary C., Agarwal B. (eds) Emerging Technologies in Computer Engineering: Microservices in Big Data Analytics. ICETCE 2019. Communications in Computer and Information Science, vol 985. Springer, Singapore

[39] Sivaram M. et al. (2019) Expert System in Determining the Quality of Superior Gourami Seed Using Forward Chaining-Based Websites. In: Somani A., Ramakrishna S., Chaudhary A., Choudhary C., Agarwal B. (eds) Emerging Technologies in Computer Engineering: Microservices in Big Data Analytics. ICETCE 2019. Communications in Computer and Information Science, vol 985. Springer, Singapore

[40] Amin Salih Mohammed et al., International Journal of Advanced Trends in Computer Science and Engineering, 8(1.2), 2019, 39- 42

[41] S. Jeya Shobana et al., International Journal of Advanced Trends in Computer Science and Engineering, 8(1.2), 2019, 43- 51

Copyright © 2019 Mélange Publications