ISSN: 2666-2795 Vol. 6 No.1 June, 2021, Netherland

International Journal of Applied Engineering Research

Smart Agriculture Monitoring System using IoT

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ABSTRACT- The vehicle is likewise considered under robot even cars (electromechanical) are considered robots since the robot is a gadget that can be utilized as a device to make work simpler and easy. Today Robots assume an imperative part in ventures like line trackers. We can't present the innovation and make a new upgrade. We just made a project with minimal expense and utilization of fewer parts. It's dependably really difficult for designers to simplify things and be less expensive than they were previously. We attempted to underscore those ideas, which is why we constructed a remote motion control robot. This undertaking is about the plan and manufacture of a remote motion-controlled camera observation Robot utilizing an esp32 camera included and an Android worked application to control the signals through HC-05 Bluetooth module with less, and modest equipment necessities. My work is to execute in the car, for example, vehicle, transports, and streetcar without the utilization of labor supply we just control these is our Smartphone. Utilizing a PDA the robot headings can be controlled through an android application and view the live video in the program application in portable. These robots may be swapped out and reprogrammed to serve a variety of purposes.

Index Terms- Gesture, ESP32 Cam, Motor Driver, Bluetooth Module, Android Mobile

I. INTRODUCTION

With supported CPUs, higher storage limits, lavisher gaming capabilities, and more specialised methods, modern sophisticated mobile phones are becoming ever more astounding. Bluetooth is mostly used for information exchange; provide PDAs new features. ESP32 Camera is a prototype (open-source) due to its user-friendly hardware and programming. It consists of a circuit board with a microcontroller that can be updated and immediate programming using the ARDUINO IDE (Integrated Development Environment), which is used to create and transfer PC code to the actual circuit board. alongside an inbuilt camera. Specialists have shown interest in motion acknowledgments and have fabricated a few robots and gadgets that are constrained by human signals. There is a consistent improvement in the field of 3 signal-controlled gadgets. Aside from hand signal acknowledgment, profound motion acknowledgment from the face is likewise finished now and again. Notwithstanding, the famously utilized method for correspondence is done through RF, Bluetooth, or Wifi. Utilizing RF restricts the separation from which the robot can be controlled.

Utilizing too many devices while driving diverts attention away from the road and is 1 out of 3 times the cause of accidents. Human-Machine Interfaces, which enable operating car electronics without distracting the drivers' attention, are the subject of several testing initiatives. In this study, a comprehensive architecture for hand signals-based infotainment hardware control is explained. The framework is based on a combination of several noteworthy and new PC vision computations, and it utilises a visible-infrared camera that is located on the vehicle's roof and highlights the shift-stick Area. Twelve of the results from 23 workers' testing of the framework on a real car and a vehicle test system indicate that the clients only slightly favour it.

II. RESEARCH ELABORATIONS

The reason for our exploration is to give less complex robot equipment design in any case, with strong computational stages so that the robot's planner can zero in on their examination furthermore, tests rather than the Bluetooth association framework. This basic design is likewise helpful for instructive advanced mechanics since understudies can construct their robots with minimal expense and use them as a stage for tests in a few courses. The fundamental motivation behind this venture is to foster a distant UI to control a robot using a remote innovation. There is a need to speak with the robot somewhat in request to control the robot development and pass basic information the two different ways.

i. Algorithm

Motion Control Robot with Remote Camera algorithms is helpful in understanding the model in detail. The step-by-step algorithm can be seen below:

Step-1: Start
Step-2: Now switch on the power supply of the kit.
Step-3: Now download and install the Bluetooth controller app.
Step-4: Now turn on the Bluetooth in the android mobile and connect the Bluetooth of the kit.
Step-5: Open the Bluetooth control app and scan for the desired device and in that connect to the HC-05 Bluetooth.
Step-6: In the Bluetooth control app we can turn on the gesture mode.
Step-7: The code should immediately function when you provide your network credentials.
Step-8: You may upload the code to your ESP32 CAM board after providing your network credentials.

Step-9: After uploading, open the serial monitor in the Arduino Ide to get its IP address.
Step-10: Once you enter the ESP IP address in a browser, a page similar to that should load.
Step-11: Next, tilt the Android device to check the browser to see if it is receiving commands and streaming content without any latency.
Step-12: When we tilt the phone in forward, then the robot moves in the forward direction.
Step-13: When we tilt the phone in backward, then the robot moves in the backward direction.
Step-14: When we tilt the phone in the left, then the robot moves in the left direction.
Step-15: When we tilt the phone in the right, then the robot moves in the right direction.
Step-16: Then switch off the power supply of the kit.

ii. Flow Chart

The stream chart to control the robot vehicle with an Android-based versatile application:

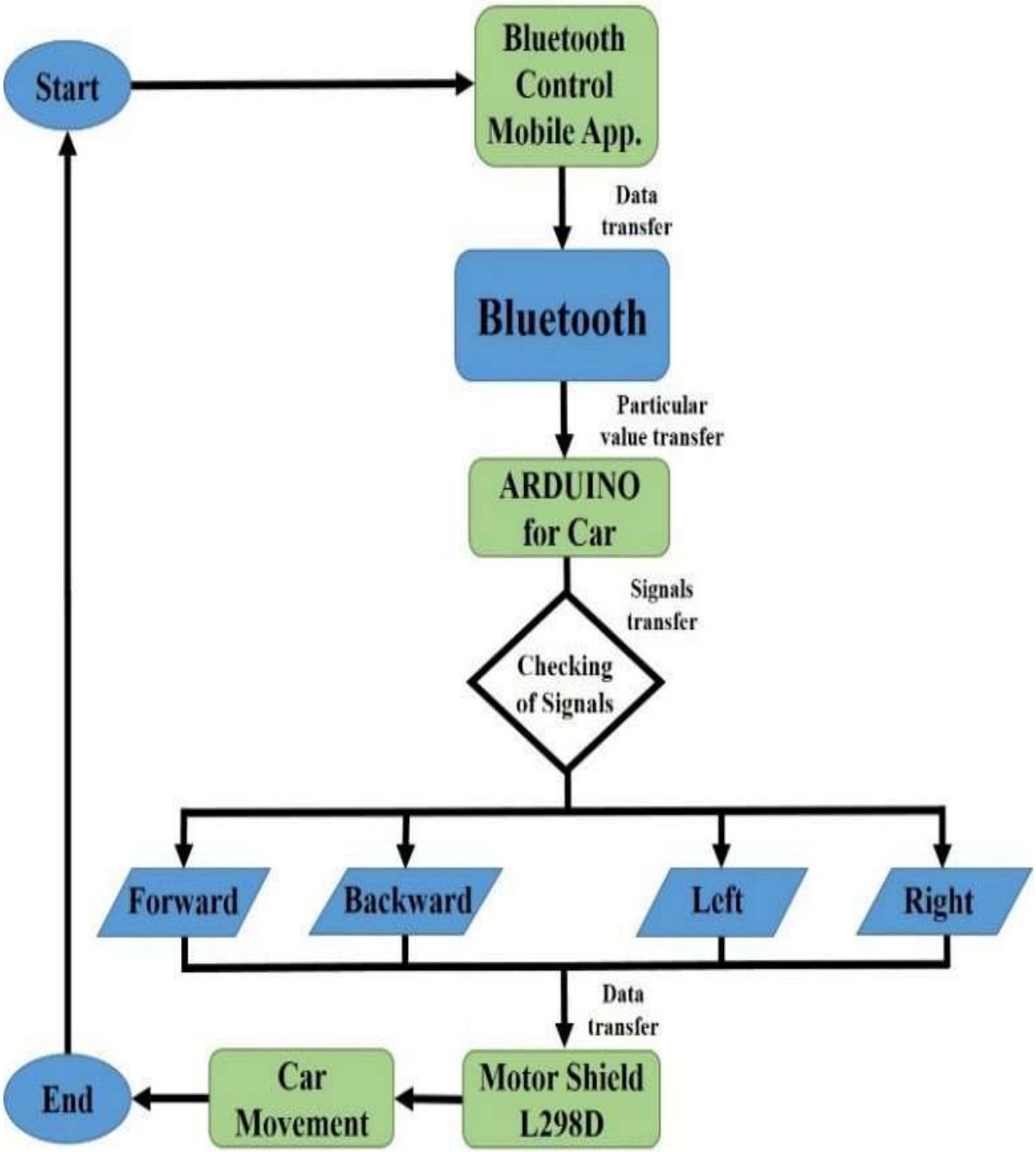

Figure 1: Flow Chart of the system

iii. Block Diagram

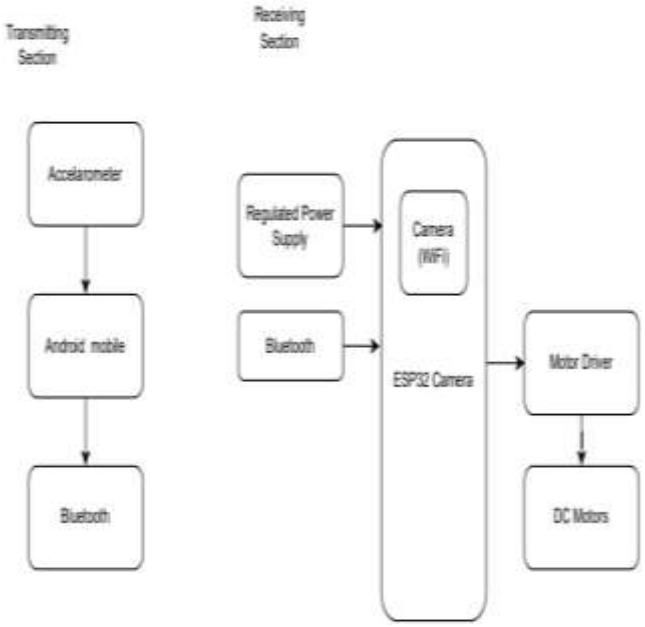

Figure 2: Block Diagram of the system

Motion-controlled robot remote camera that will be constrained by a hand gloved mounted with the transmission circuit gathering. The circuit gathering will comprise an ESP32 Camera and Arduino board alongside an HC-05 Bluetooth, which together are capable as an input gadget to the robot. The essential goal is to do a fundamental utilization of controlling a vehicle with your hand with live video observation.

Web page control

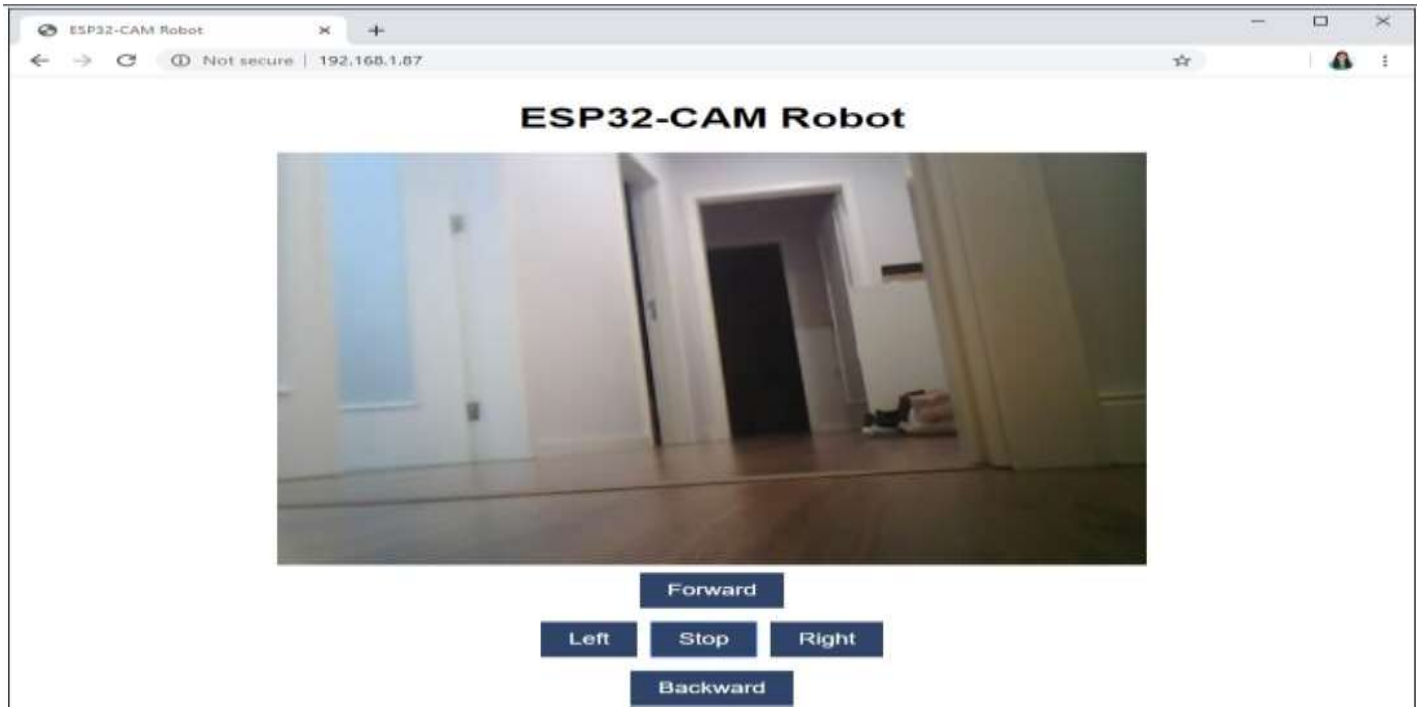

Figure 3: Web page controls

The above-given picture shows the control panel to operate the sanitization robot. This control panel is obtained by searching the Ip address 192.168.83.225 in a browser. This Ip address connects both the mobile handset and the ESP32-CAM in the robot so that operator can operate using the controls on the webpage. This method is very easy to use as there is no need for any specific controller. Any mobile handset with a Wi-Fi feature can be used as a controller. The two wheels at the rear and the freewheel at the front are used for movement. The two wheels are used for movement as the dc motors attached to them are rotating. The forward, reverse, stop, as well as right and left controls are also available.

iv. METHODOLOGY

HC-05 BLUETOOTH: HC-05 Serial Bluetooth item comprises of Bluetooth sequential point of interaction module and Bluetooth connector. The Bluetooth sequential module is used to entirely convert sequential ports to Bluetooth. With a full 2.4GHz radio handset and baseband, the sequential port Bluetooth module is fully qualified for Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation.

ESP32 CAM: ESP32-CAM is a minimal expense ESP32-based improvement board with an installed camera, little in size. It is an ideal answer for IoT applications, model developments, and DIY projects. The board incorporates Wifi, customary Bluetooth, and low-power BLE, with 2 high execution 32-digit LX6 CPUs.

MOTOR DIVER: At voltages ranging from 4.5 V to 36 V, the L293D is designed to provide bidirectional driving fluxes of up to 600 mA. A medium-power engine driver perfect for operating DC Motors and Stepper Motors is the L293D Motor Driver Module. It makes use of the well-known L293 engine driver IC. It can turn on and off four DC engines or regulate two DC engines' direction and speed.

ANDROID MOBILE AS ACCELEROMETER: When you use a compass app on your smartphone, it somehow recognises the direction in which the device is pointed. With stargazing programmes, it somehow understands where you're looking overhead to display celestial bodies properly. A little device made of pivot-based movement detecting is used by cell phones and other portable technology to distinguish their orientation.

III. RESULTS

In the system testing the mechanism is tested for movement once it receives. The accelerometer ought to find the movement of the hand and perform the movement as per the codes and also the signals square measure being sent to the Motor Driver. The wheels can then receive the signal from the motors, which may also cause the wheels to move. Once we repeatedly tilt our hand forward, backward, right, and left, the mechanism moves in all four directions. Once the hand is unbroken and parallel to the ground, the mechanism stops. There's a camera mounted on the mechanism which is capable of zooming in and out similarly to as capable of rotating in 360 degrees. We will get output video stream perpetually on our Android-based smartphone or laptop computer by that we tend to will decide the movement of our mechanism.

- The experimental setup of the kit.

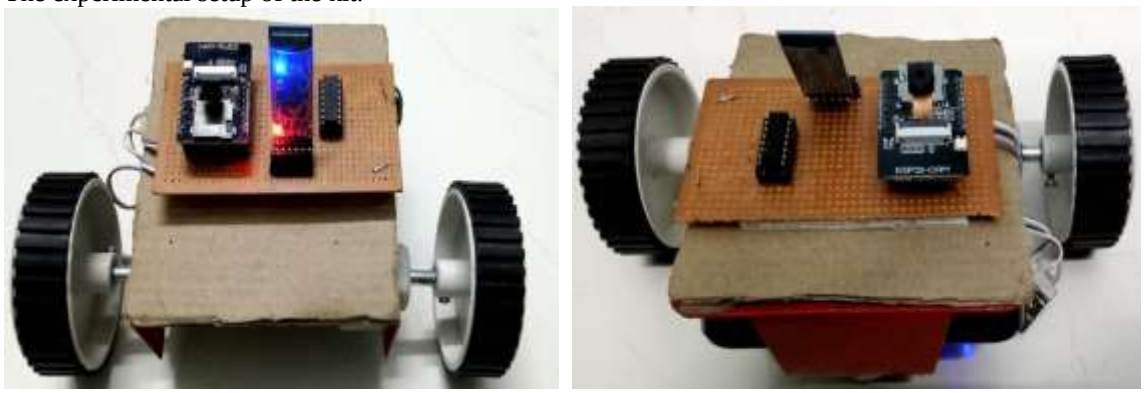

Figure 4: Experimental setup of the kit

- The robot moves in a Forwarding direction.

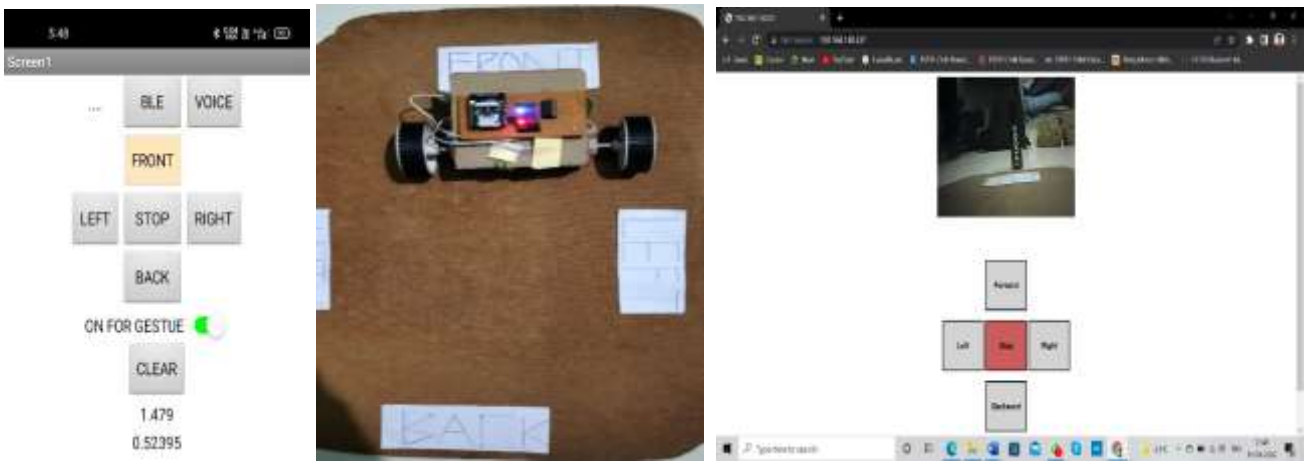

Figure 5: Result of a robot in forwarding direction

- Robot moves in a backward direction

Figure 6: Result of a robot in a backward direction

- Robot moves in a left direction

Figure 7: Result of a robot in the left direction

- Robot moves in a right direction

Figure 8: Result of a robot in the right direction

- The robot is at a stop position

Figure 9: Result of a robot is at a stop position

IV. CONCLUSION

It's dependably quite difficult for specialists to simplify things and less expensive the way they were previously. Likewise, our fundamental objective was to make it more affordable so we were more cognizant about picking the parts. Even though we attempted to make it less costly however we didn't think twice about the quality. We attempted to make it more dependable what's more, straightforward. The greatest benefit of our task is that it's exceptionally simple to control and live surveillance. The Gesture-controlled robot planned in this work has numerous future scopes. In this paper, the plan and execution of Gesture Controlled Robot are introduced and created utilizing ESP32 Camera and Android Smartphone. A calculation has been given and its working is nitty-gritty completely. Since the refreshing potential outcomes are unending, refreshing the framework has been kept as a future extension. The assembled gadget is modest and is not difficult to convey starting with one spot and then onto the next. The expansion of the few extra sensors or cameras will make it more useful.

V. ACKNOWLEDGEMENT

The authors want to extend thanks to the Department of Electronics and Communication Engineering and QIS management.

VI. REFERENCES

[1] Xing-Han Wu, Mu-Chun Su, Pa-Chun Wang. A Hand-Gesture-Based Control Interface for a Car-Robot. Proceedings of 2010 IEEE/RSJ International Conference on Intelligent Robots
and Systems, October 18-22, 2010, Taipei, Taiwan.

[2] Gordon McAllister, Stephen, J. McKenna, Ian W Ricketts. Towards a non-contact driver-vehicle interface. Proceedings of 2000 IEEE Intelligent Transportation Systems Conference Proceedings. Dearborn (MI), USA October l-3, 2000.

[3] Martin Zobl, Michael Geigel, Bjom Schullec, Manfred Lang, Gerhard Rigoll. A real-time system for hand gesture-controlled operation of in-car devices. Proceedings of 2003 IEEE, ICME 2003.

[4] David Bannach, Oliver Amft, Kai S. Kunze, Ernst A. Heinz, Gerhard Tr¨oster, Paul Lukowicz . Waving Real Hand Gestures Recorded by Wearable Motion Sensors to a Virtual Car and Driver in a Mixed-Reality Parking Game. Proceedings of the 2007 IEEE Symposium on Computational Intelligence and Games (CIG 2007).

[5] Carl A. Pickering, Keith J. Burnham, Michael J. Richardson. A Research Study of Hand Gesture Recognition Technologies and Applications for Human Vehicle Interaction. Jaguar and Land Rover Technical Research, UK, Jaguar Cars, Engineering Centre, Whitley, Coventry. Coventry University, UK, Control Theory and Applications Centre, Priory Street, Coventry.

[6] Ren C. Luo. Confidence Fusion Based Human-Robot Interaction with Hand Gesture and Emotion Recognition for Service Robotics. Proceedings of CINTI 2012, 13th IEEE International Symposium on Computational Intelligence and Informatics, 20–22 November, 2012, Budapest, Hungary.

[7] Sha Zhao, Shijian Li, Longbiao Chen, Yang Ding, ZemingZheng, Gang Pan. iCPS-Car: An Intelligent Cyber-Physical System for Smart Automobiles. Proceedings of 2013 IEEE. DOI 10.11.09

[8] Han Jia Qi, Markus Santoso. Immersive Driving Car Simulation for Children using Natural User Interface Controller. Proceedings of 2013 IEEE. DOI 10.11.09/ISUVR.2013.17.

[9] Francisco Parada-Loira, Elisardo González-Agulla, José L. Alba-Castro. Hand Gestures to Control Infotainment Equipment in Cars. Proceedings of 2014 IEEE Intelligent Vehicles Symposium (IV), June 8-11, 2014. Dearborn, Michigan, USA.

10. G.Sabarmathi , Dr.R.Chinnaiyan (2018),"Envisagation and Analysis of Mosquito Borne Fevers – A Health Monitoring System by Envisagative Computing using Big Data Analytics" in ICCBI 2018 – Springer on 19.12.2018 to 20.12.2018 (Recommended for Scopus Indexed Publication IEEE Xplore digital library)
11. G.Sabarmathi , Dr.R.Chinnaiyan, Reliable Data Mining Tasks and Techniques for Industrial Applications, IAETSD JOURNAL FOR ADVANCED RESEARCH IN APPLIED SCIENCES, VOLUME 4, ISSUE 7, DEC/2017,PP- 138-142, ISSN NO: 2394-8442
12. Dr. M. Thangamani, Jafar Ali Ibrahim, Information Technology E-Service Management System, International Scientific Global Journal in Engineering Science and Applied Research (ISGJESAR). Vol.1. Issue 4, pp. 13-18, 2017. http://isgjesar.com/Papers/Volume1,Issue4/paper2.pdf
13. Ibrahim, Mr S. Jafar Ali, K. Singaraj, P. Jebaroopan, and S. A. Sheikfareed. "Android Based Robot for Industrial Application." International Journal of Engineering Research & Technology 3, no. 3 (2014).
14. Ibrahim, S. Jafar Ali, and M. Thangamani. "Momentous Innovations in the Prospective Method of Drug Development." In Proceedings of the 2018 International Conference on Digital Medicine and Image Processing, pp. 37-41. 2018.
15. Ibrahim, S. Jafar Ali, and M. Thangamani. "Prediction of Novel Drugs and Diseases for Hepatocellular Carcinoma Based on Multi-Source Simulated Annealing Based Random Walk." Journal of medical systems 42, no. 10 (2018): 188. https://doi.org/10.1007/s10916-018-1038-y ISSN 1311-8080, https://acadpubl.eu/hub/2018-119-16/1/94.pdf
16. Jafar Ali Ibrahim. S, Mohamed Affir. A "Effective Scheduling of Jobs Using Reallocation of Resources Along With Best Fit Strategy and Priority", International Journal of Science Engineering and Advanced Technology(IJSEAT) – ISSN No: 2321- 6905, Vol.2, Issue.2, Feb-2014, http://www.ijseat.com/index.php/ijseat/article/view/62
17. M. Thangamani, and Jafar Ali Ibrahim. S, "Knowledge Exploration in Image Text Data using Data Hiding Scheme," Lecture Notes in Engineering and Computer Science: Proceedings of The International MultiConference of Engineers and Computer Scientists 2018, 14-16 March, 2018, Hong Kong, pp352-357 http://www.iaeng.org/publication/IMECS2018/IMECS2018_pp352-357.pdf
18. M. Thangamani, and Jafar Ali Ibrahim. S, "Knowledge Exploration in Image Text Data using Data Hiding Scheme," Lecture Notes in Engineering and Computer Science: Proceedings of The International MultiConference of Engineers and Computer Scientists 2018, 14-16 March, 2018, Hong Kong, pp352-357 http://www.iaeng.org/publication/IMECS2018/IMECS2018_pp352-357.pdf
19. S. Jafar Ali Ibrahim and M. Thangamani. 2018. Momentous Innovations in the Prospective Method of Drug Development. In Proceedings of the 2018 International Conference on Digital Medicine and Image Processing (DMIP '18). Association for Computing Machinery, New York, NY, USA, 37–41. https://doi.org/10.1145/3299852.3299854
20. S. Jafar Ali Ibrahim and Thangamani, M "Proliferators and Inhibitors Of Hepatocellular Carcinoma", International Journal of Pure and Applied Mathematics (IJPAM) Special Issue of Mathematical Modelling of Engineering Problems Vol 119 Issue. 15. July 2018
21. Thangamani, M., and S. Jafar Ali Ibrahim. "Ensemble Based Fuzzy with Particle Swarm Optimization Based Weighted Clustering (Efpso-Wc) and Gene Ontology for Microarray Gene Expression." In Proceedings of the 2018 International Conference on Digital Medicine and Image Processing, pp. 48-55. 2018. https://dl.acm.org/doi/abs/10.1145/3299852.3299866
22. Testing" , IEEE International Conference on Intelligent Computing and Control Systems, ICICCS 2017, 512 – 517
23. Dr.R.Chinnaiyan, Abishek Kumar(2017) ,"Construction of Estimated Level Based Balanced Binary Search Tree", 2017 IEEE International Conference on Electronics,Communication, and Aerospace Technology (ICECA 2017), 344 - 348, 978-1-5090-5686-6.
24. R.Chinnaiyan, S.Somasundaram (2012) , Reliability Estimation Model for Software Components using CEP", International Journal of Mechanical and Industrial Engineering (IJMIE) , ISSN No.2231-6477, Volume-2, Issue-2, 2012, pp.89-93.
25. R.Chinnaiyan, S. Somasundaram (2011) ,"An SMS based Failure Maintenance and Reliability Management of Component Based Software Systems", European Journal of Scientific Research, Vol. 59 Issue 1, 9/1/2011, pp.123 (cited in EBSCO, Impact Factor: 0.045)
26. R.Chinnaiyan, S.Somasundaram(2011), "An Experimental Study on Reliability Estimation of GNU Compiler Components - A Review", International Journal of Computer Applications, Vol.25, No.3, July 2011, pp.13-16. (Impact Factor: 0.814)
27. R.Chinnaiyan, S.Somasundaram(2010) "Evaluating the Reliability of Component Based Software Systems " ,International Journal of Quality and Reliability Management , Vol. 27, No. 1., pp. 78-88 (Impact Factor: 0.406)
28. Dr.R.Chinnaiyan, Abishek Kumar(2017), Estimation of Optimal Path in Wireless Sensor Networks based on Adjancy List, 2017 IEEE International Conference on Telecommunication,Power Analysis and Computing Techniques (ICTPACT2017) ,6,7,8th April 2017,IEEE 978-1-5090-3381-2.