iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** III **Month of publication:** March 2022

DOI: https://doi.org/10.22214/ijraset.2022.41018

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue III Mar 2022- Available at www.ijraset.com

Minning Safety System

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Abstract: Today In This World Safety Of Miners Is Major Challenge. Miner's health and life is vulnerable to several critical issues, which includes not only the working environment, but also the after effect of it. Mining activities release harmful and toxic gases in turn exposing the associated workers into the danger of survival. This puts a lot of pressure on the mining industry. To increase the productivity and reduce the cost of mining along with consideration of the safety of workers, an innovative approach is required.

Miner's health is in danger mainly because of the toxic gases which are very often released in underground mines. These gases cannot be detected easily by human senses. A real time monitoring system using wireless sensor network, which includes multiple sensors, is developed. This system monitors surrounding environmental parameters such as temperature, humidity and multiple toxic gases. This system also provides an early warning, which will be helpful to all miners present inside the mine to save their life before any casualty occurs. The system uses wireless sensor network technology to establish wireless sensor network.

Keywords: html5, css3, Jscript.

I. INTRODUCTION

Safety of workers should always be of major consideration in any form of mining, whether it is coal or any other minerals. Real time monitoring of toxic gases and other parameters present in underground mine has analysed using wireless sensor network. A real time monitoring system is developed to provide clearer and more point to point perspective of the underground mine Mining environment often has hidden dangers within such as toxic gases, which may present severe health exposures to the people working within mining. These gases need to be detected at times and informed the dangerous situation in right time for the safety of miners. Wired network monitoring systems have assisted the mine safety significantly, but it is not idea for all types of mining environment.
A real-time monitoring systems may assist in monitoring and control over the mining environment. Wireless sensor network technology offers its most of the advantages ideal for the real-time monitoring system. Thus, the primary objective of this project is decided to design an efficient real-time monitoring system so that various leaked mine gases could be identified and it can prevent accordingly

II. LITERATURE SURVEY

A structured coal mine administration framework to handle the progressing checking and extremely compelling spare issues of underground work stages. The sensor network substation is fixed at fitting between times in mine laneways to (RFID) position and gas intensities. What's more, a short time later the information is full and exchanged to checking [1]. Use for observance and revelation of fireplace in coal mines exploitation remote detector frameworks (WSNs). the appliance uses BDI (Belief, need and Intention) primarily based multi-administrator model and its utilization on detector frameworks. The argot used for execution is deciphered by Jason; associate extension of Agent Speak that depends upon the BDI style[2].The BDI director area unit responsive orchestrating frameworks; frameworks that don't seem to .be expected to method the estimation of a limit what is additional, finish but rather projected to be constantly running what is all the additional, reacting to some kind of event. The scattered model of the condition is gotten to beat the correspondence overhead, management use, organize deferral and unafraid quality on a sure along base station [3]. The building of highways in China has led to an increasingly serious problem leaving more and more coal under highways. Having as much as possible the unexploited coal and maintaining highway safety at the same time becomes a problem that must be addressed as a matter of urgency [4]. The paper addressed the characteristics of road deformations caused by underground mining, suggesting the rules to be followed while mining under highway protective coal pillar. Methods for the security mining of protective coal pillar under highway were put forward in the study on the basis of improving and integrating the existing methods for mining protective coal pillar [5]. The importance of the Coal Mine Production Safety Supervision and the specific issues that might occur under the concept of safety supervision function is proposed to create the Coal Mine Safety Production Supervision Program.

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The results, show that the addition of independent third parties to the coal mine production process implementation services in compliance with applicable guidelines, laws, rules and regulations and technical standards and the conduct of coal mining companies to establish an effective restriction framework can compensate for the government's macroscopic control and its own limitations. The establishment of the system to provide a reliable guarantee for coal mine safety production [6]. In the supply chain management (SCM) of coal companies, the volatility of the occurrence of raw coal and coal quality and the various limitations on mine production capacity are the major factors that need to be taken into account. This paper combines a supply chain model for coal mine planning with a linear programming model for production scheduling to allow coal companies respond quickly to change

III. PROPOSED SYSTEM

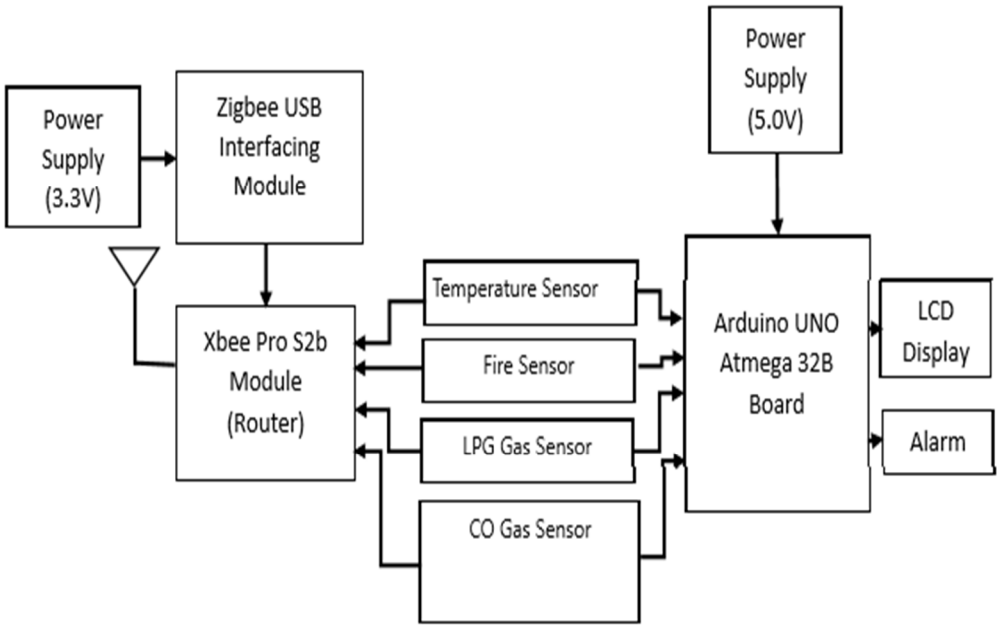


Fig.1 Block diagram of sensor unit

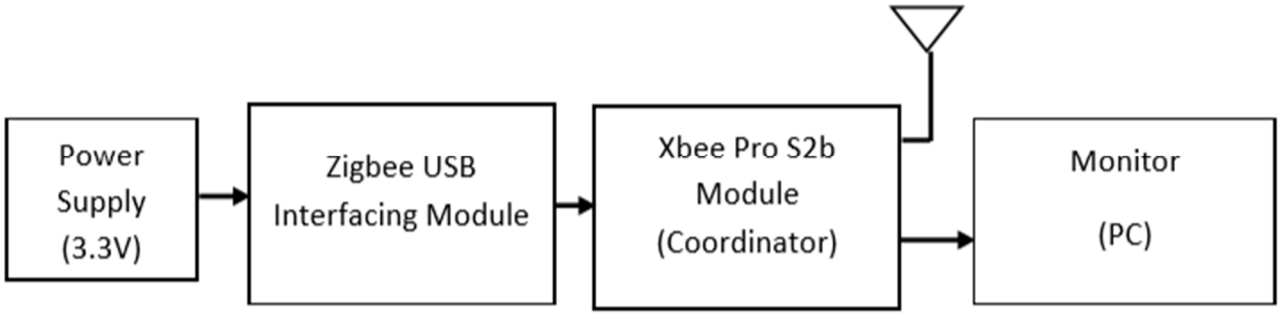


Fig.2 Block diagram of monitoring system

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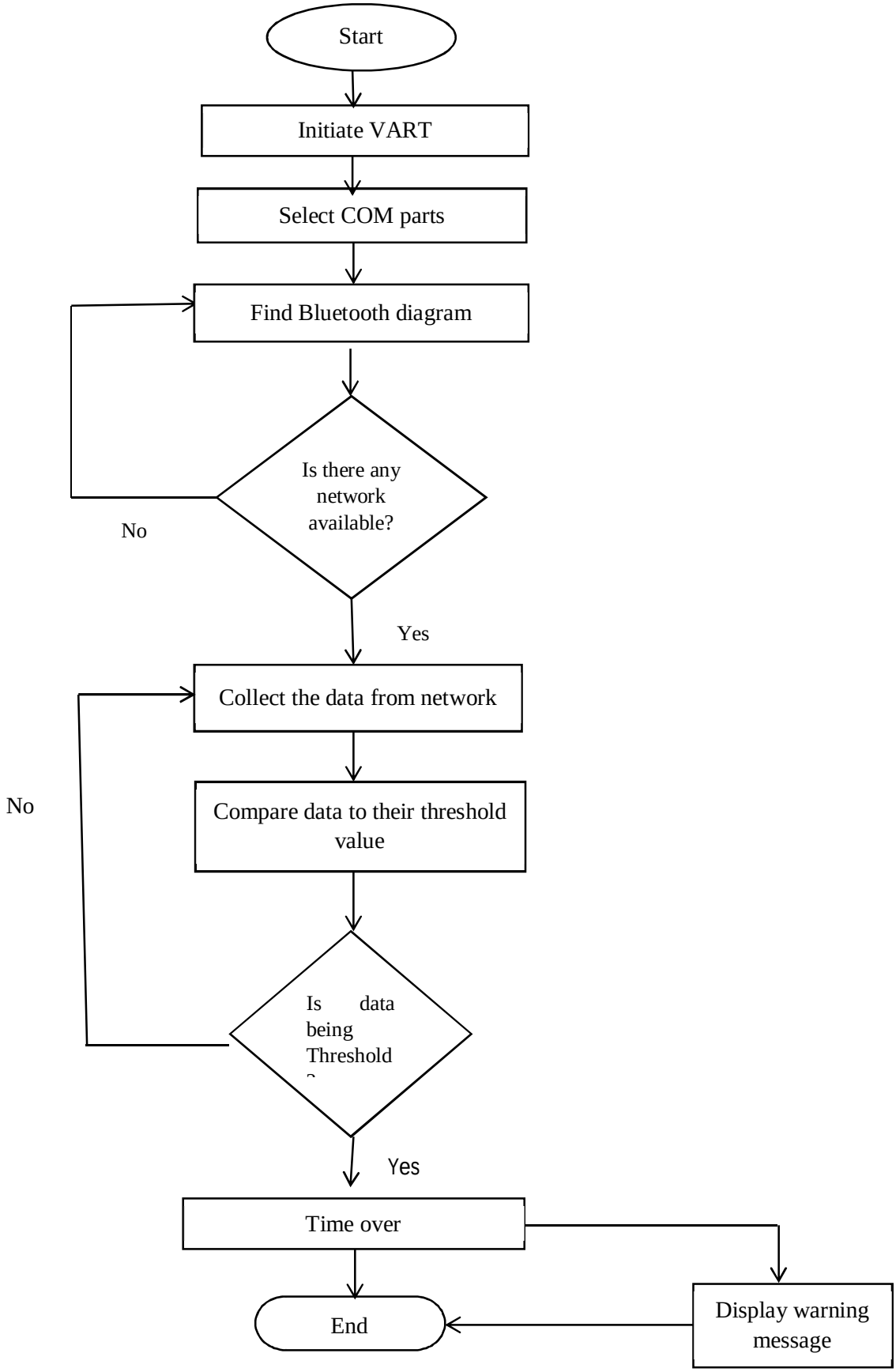
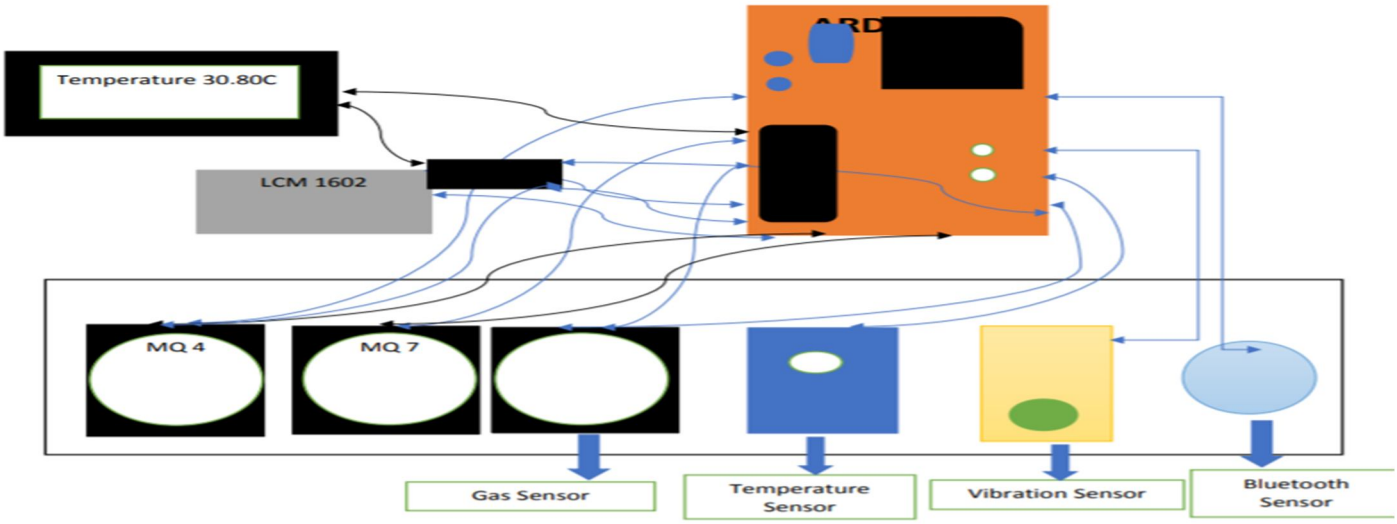


Fig.3 Flowchart of monitoring system

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IV. SYSTEM ARCHITECTURE



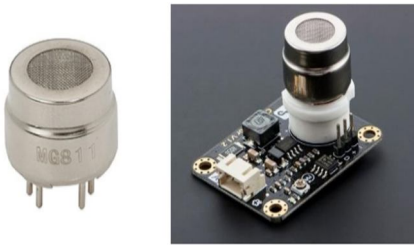
V. APPLICATIONS



Methane gas sensor (MQ-4)

MQ-4 gas sensor composed of ceramic tube and Tin Dioxide. Electrode and heater are fixed into a layer. The heater provides required work conditions for the work of sensitive components.

When the target combustible gas present, the conductivity of sensor is higher along with the gas concentration rising. The MQ-4 sensor has 6 pins in which 4 of them are used to fetch signals and other 2 are used.

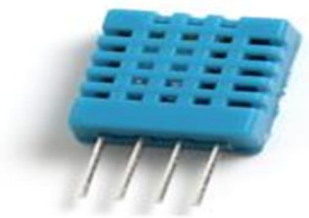


Carbon Dioxide Sensor (MG811)

This CO2 sensor is designed by DFRobot engineer. The MG-811 sensor is highly sensitive to CO2 and less sensitive to alcohol and CO. The MG-811 sensor has low humidity and temperature dependency. Its structure same as MQ-7 but parts material are different.

This sensor composed by solid electrolyte layer, Heater, Platinum Lead, Gold electrodes, Porcelain Tube, 100m double-layer steeliness net, Nickel and copper plated ring.

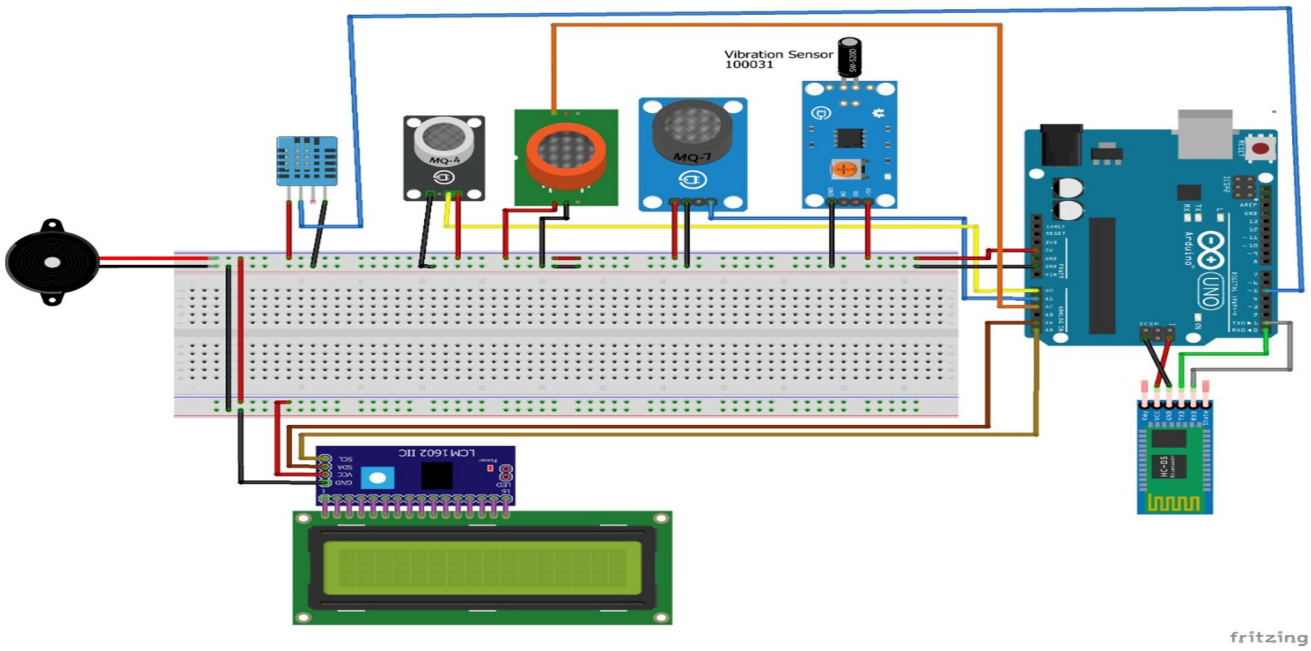
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DHT-11 Sensor

This DHT11 Sensor measures the temperature and humidity. The sensor has greater reliability and very good stability. A resistive-type humidity measuring component with negative temperature coefficient is used. It connects to a microcontroller and shows excellent quality, anti-interference and fast response ability.

VI. RESULTS



VII. CONCLUSION

The development of coal mining protection for employees using Arduino, Gas Sensor, LDR, Temperature and Humidity Sensor continues to track the safety of mining and update information to the IoT site. By using this tool, we guarantee the safety of workers

VIII. ACKNOWLEDGMENT

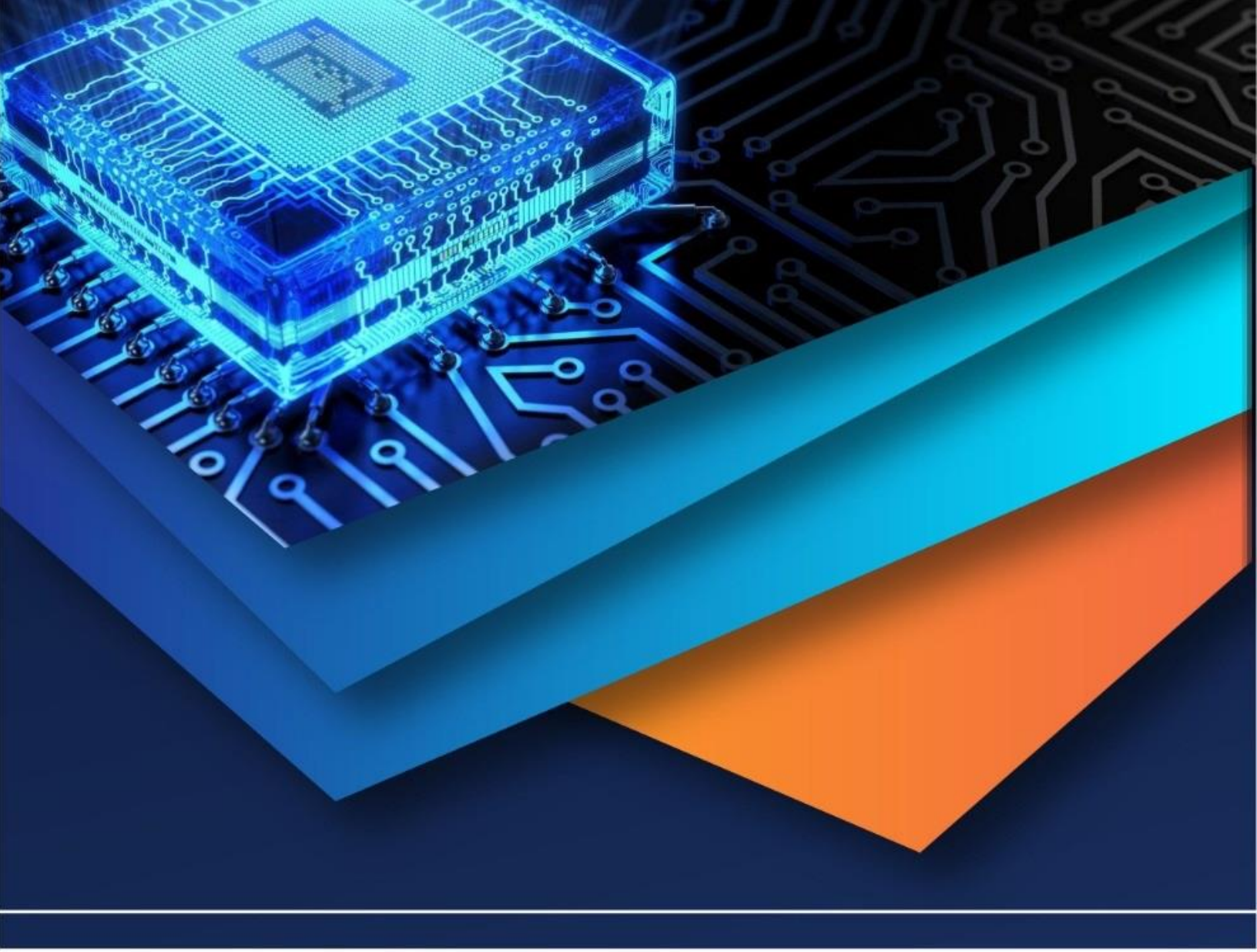
We express sincere gratitude to the HOD of computer department prof. Uttara gogate and core faculty of computer department of shivajirao s. jondhale college of engineering dombivli(e) for providing an opportunity to acquire knowledge from corporate world and understand it business.

We sincerely wish to thank the project guide Prof. Samita Patil for her encouragement and inspiring guidance, she helped us to make our project successful. Our project guide makes us endure with her expert guidance, kind advice and timely motivation which helped us to determine our project.

Lastly, we would like to thank our college principal Dr. Pramod R. Rodge for providing lab facilities and permitting to go on with our project. We would also like to thank everyone who helped us in our project in some way or other which includes providing us with some information.

REFERENCES

[1] D. Prabhu1, V. Naga Nikhil J. Shiva Kumar3 "IoT Based Coal Mining Safety for Workers using Arduino" ISSN 2321 3361-2019
[2] Yingli Zhu ,Guoping You. 'Performance Analysis of Routing for Wireless Sensor Network'. Proceedings of 3rd International Conference on Mechatronics Engineering and Information Technology(ICMEIT 2019), Vol. 2, pp. 755-758, March,2019.
[3] S.Kumari1, T.K Divya 2, K. Keerthana3, S.Nisha4, S.Pallavi5 "IOT based Coal Mine Safety Monitoring and Controlling"IEEE MARCH-2019
[4] S.Sujitha; Dr. J. B. Shajilin Loret; Mrs. D. Merlin Gethsy "IOT BASED SMART MINE SAFETY SYSTEM USING ARDUINOI" JCSMC, Vol. 9, Issue. 5, May 2020, pg.141 – 145
[5] Boddapati Venkata Sai Phani Gopal, Pakirabad Akash, P.S.G.Aruna Sri "Design Of Iot Based Coal Mine Safety System Using NodemcuInternational Journal of Innovative Technology and Exploring Engineering' (IJITEE)ISSN: 2278-3075, Volume-8 Issue-6, April 2019
[6] Narreddy Vamsi Krishna Reddy, Gowtham Manikanta Varma, "Design of IoT Based Coal Mine Safety System Using Arduino UNO Annals of R.S.C.B." ISSN: 1583-6258, Vol. 25, Issue 5, 2021, Pages. 5663 - 5670 Received 15 May 2021; Accepted 20 May 2021.
[7] Binghua Hao,Dan Chang,Zengping Zhang,Hailong Ji." Monitoring System for Coal Mine Safety Based on Wireless Sensor Network" (ICMEIT 2019), Vol. 2, pp. 755-758, March**,**2019**.**
[8] MuzafferKanaan, EdaŞimşek, "The Use of ZigBee Technology for Coal Mine Safety", IEEE-2016.
[9] M. Li and Y.-H. Liu, "Underground coal mine monitoring with wireless sensor networks," ACM -2009 Trans. Sens. Netw., vol. 5, no. 2, pp. 1–29. [10] Jun Dong, Yuan-Ping Cheng, Teng-Yuan Chang, Jing-Jing Zhang, ShuaiFeiGuo, Coal mine methane control cost and full cost: The case of the LulingCoal Mine, Huaibei coalfield, China, Elsevier Journal of Natural Gas Science and Engineering 26 (2015) 290-302.
[10] Sachin M. Ledange, Swarup S. Mathurkar, Robot Based Wireless Monitoring and Safety System for Underground Coal Mines using Protocol: A Review, International Journal of Science, Engineering and Technology Research (IJSETR), Volume 5, Issue 1, January 2016.
[11] XiangzhongMeng, Peng Lu, Baolei Wang, Coal Mine Safety Warning System Based on Principal Component Method and Neural Network, 6th Data Driven Control and Learning Systems Conference May 26-27, 2017, Chongqing, China IEEE-2017.
[12] Florian Liedmann, Christoph Holewa and Christian Wietfeld, The Radio Field as a Sensor - a Segmentation Based Soil Moisture Sensing Approach, 2018 IEEE.
[13] Tongyu Liu, Wei Li, Xiangjun Meng, Yubin Wei, Jie Hu, Tingting Zhang, Weiosng Zhao, Advance of fiber optic gas sensors for coal mine safety applications, 2015 International Conference on Microwave and Photonics (ICMAP) IEEE



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