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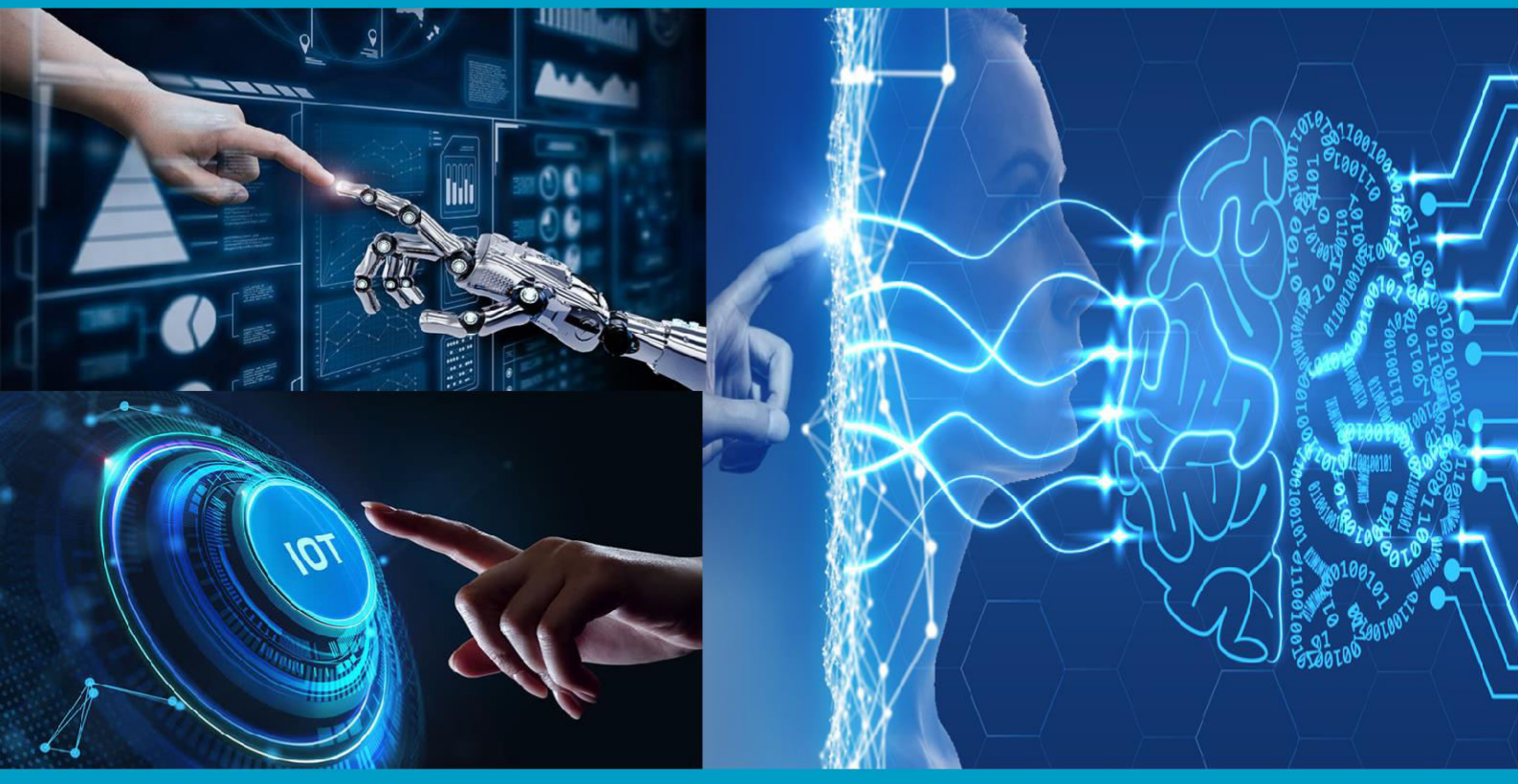

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Flex Sensor Based Robotic Vehicle Using Arduino

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***ABSTRACT*:** For The usage of arduino for robotic vehicle movement and control is an assistive robot system for user-friendly support, medical operations, and hazardous situations, as well as to boost the autonomy of physically disabled persons. It is a type of functional replacement that is incorporated with a moving vehicle and helps amputees who face physical challenges. The system's main goal is to make it possible for physically challenged persons to interact with robots by recognising hand signals. This is an electrochemical system in which the robdrive is controlled by the Flex sensor, a basic inertial navigation sensor. The arduino controller processes the gesture commands measured by the flex sensor. At the robot, an Arduino controller is used. The Arduino controller is utilised on the robot side, and the robotic vehicle may travel in any direction by using wired communication from the sensors attached to the hand. The robotic arm can move left, right, and forward among other things.For controlling the motor driver, I.e., an Arduino controller, as well as simple ways to convey their intentions and interactions with the environment.

KEYWORDS: Flex Sensor, Arduino and Motor driver are some of the terms used to describe the project.

I. INTRODUCTION

To stay one step ahead of competition, today's industry is primarily concentrating on computer-based interaction and robotics to boost production and deliver finished goods with consistent quality. Robots nowadays are faster, smarter, more cautious, precise, and more reasonable than in previous years, making them increasingly suitable for high mix-low volume and low mix-high volume manufacturing. Collaborative robots, sometimes known as "cobots," may work alongside people and physically engage with them in a shared office. Furthermore, cobots employ sensor technology, which allows them to operate alongside humans in dangerous environments while preventing them from performing dangerous tasks. Robots are typically utilized to undertake hazardous, difficult, and repetitive tasks, as well as to reduce the presence of humans. due to its error-free operation, has greatly increased and has been universally approved by various countries. Aside from industries, robots are ideal for building a home automation system for the elderly and a support system for the physically disabled. Gesture recognition is a flexible interface between robots and humans. It permits complex machinery to be operated with only hand movement, avoiding physical interaction. The gesture-controlled robots offer a way to integrate disabled individuals into their regular working lives while also increasing their autonomy in daily routines. This level of control could provide a practical means for impaired persons to gain more freedom. They may even be able to assist with military and defence activities They may even be able to assist with military and defence activities. They're also useful in surgical procedures.In some cases, surgeons were unable to execute procedures on time, which might be fatal in many cases, and patient relocation became impossible. Using multiple motion instructions, thissystem may investigate the remote robot in a variety of environments

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II. LITERATURE SURVEY

Sakshi Sharma and Piyush Yadav: The goal is to alter people's perceptions of remote controllers for manually operated Robotic-Hand devices. Well, this study proposes a method for replacing buttons and joysticks with a more novel technology, namely, commanding the entire Robotic Hand with the user's hand movement, motion, or gesture. The design and development of a Five Fingered Robotic Hand (FFRH) using an Arduino board, sensors, and wireless feedback are discussed in this work. The system is designed with a simple, flexible, and minimum control technique in mind. The Robotic Hand has its own set of controls for all five fingers, wrist up and down, base clockwise and counterclockwise, bot movement, Pick and Place, and home position.

Kumar Aaditya, Divesh Kumar Pande and Preksha Moondra, with the goal of changing people's perceptions of remote controllers for actuating manually controlledRobotic vehicles. This work elucidates the reality that humans will always wish to follow safety procedures at work and in their surroundings in order to perform specific jobs, such as sending a robotic vehicle into a hazardous environment to collect samples for chemical analysis. It is a microcontroller-based control system that works in conjunction with an Android app. It may be accessed via an android application, which can manage the vehicle's mobility as well as its robotic arms. This study presents a design analysis of an Android Controlled "Pick and Place" Robotic vehicle system includes a Bluetooth module that serves as the vehicle's receiver.

III. PROPOSED METHODOLOGIES

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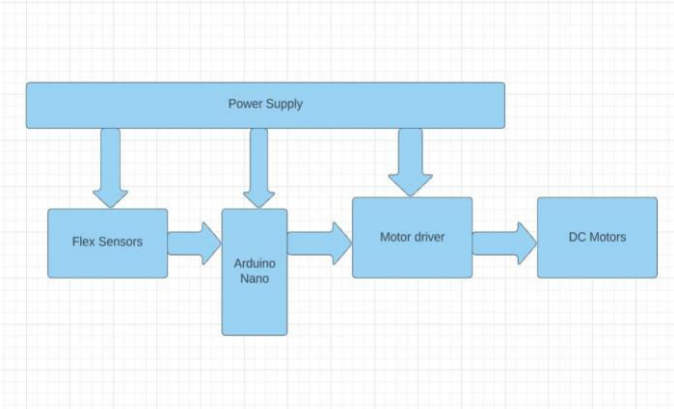

Fig 1. The proposed methodology of the block diagram

In this project we have used the flex sensor, arduno nano, motor driver and dc motors.. when we bend flex sensorsthe deflection of angle occur and information goes to Arduino nano through connected wires dc motors also connected to Arduino nano in between motor driver is present because if we give direct connection to motors through supply it may damage so motor driver is used.

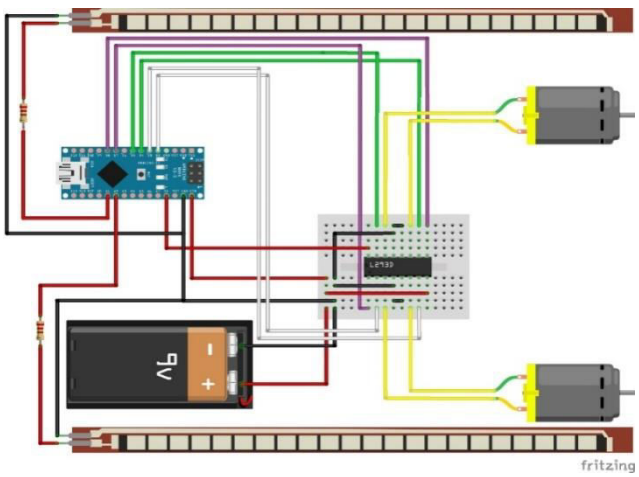

Fig 2. The proposed methodology of the circuit diagram

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From the circuit diagram consists of Arduino Nano, Flex sensors, Motor Driver, DC motors and connecting wires .Arduino digitalpins are connected to motor driver and analog pins of Arduino nano are connected to flex sensors through resistors through soldiering and two dc motors are connected to motor driver. Supply pins are also connected to motor driver. When we bend flex sensors connected to glove placed on hand when we bend flex sensors it will move corresponding directions.

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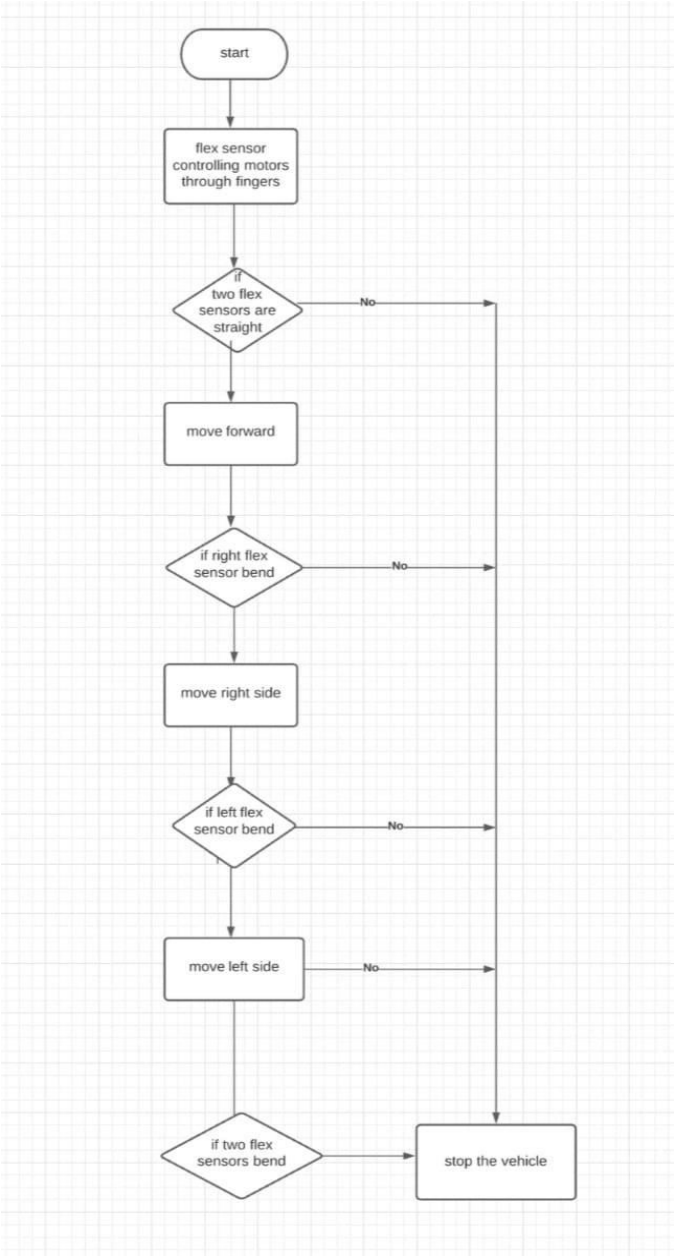

Fig 3. The proposed methodology for Flow chart

Basically, flow chart is a systematic representation of any project or problem. In our project the first most step is when we bend any flex sensors motor should move and when we bend two flex sensors the vehicle should stop and when we bend right flex sensor the vehicle should move in right side and when left sensor bends the vehicle moves in left direction. If two flex sensors are in straight position the vehicle moves in forward direction

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IV. OBSERVATION AND RESULT

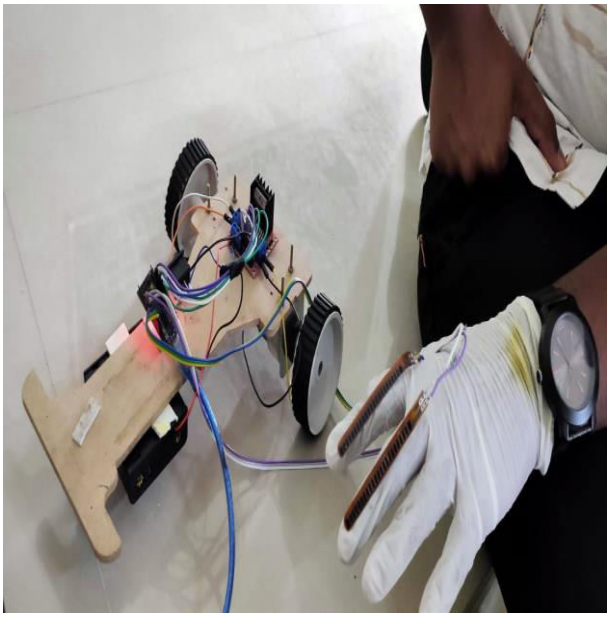

Fig 4. Circuit kit and working

We should dump the code into Arduino nano by Arduino IDE. First when we start the equipment we switch on the switch it will get power from batteries and we need to connect arduino cable to arduino nano and it connected to laptop after dump the code in to arduino .when two flex sensors are in straight position the vehicle moves in forward direction both wheels will rotate. The flex sensor connected to arduino nano we remember while doing the code with purple wire another flex sensor is connected to green wire to remember .when we bend right side flex sensor it will move right direction while moving right wheel only moves the left wheel will not move. While in the situation for when we bend left flex sensor it will move left direction and while moving left wheel only rotate and right wheel will not move. when we bend both flex sensors the vehicle will stop. The vehicle will not move in any direction. .So while travelling the physically challenged people this device will help them.

V. CONCLUSION

Flex sensor controlled vehicle helpful for mainly physically challenged people and equipment cost also less compared to previous vehicles we are used only two flex sensors to run the vehicle. In previous main projects they are used five flex sensors to run the vehicle. This device will make reduce human effort for challenged people.

REFERENCES

[1] Kumar Aaditya, Divesh Kumar Pande and Preksha Moondra, “Android Controlled Pick and Place Robotic Arm Vehicle”, International Research Journal of Engineering and Technology, 2015.
[2] S. Senthil Kumar, “Robotic Arm Control through Internet/LAN for Patient Operation”, International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 4, Issue 7, July 2015.
[3] Ankur Dang, Vibhum Chandorkar, Aishwarya Pawar and Dhairya Pawar,”Hand Motion Controlled Robotic Vehicle with Obstacle Detection”, International Research of Engineering and Technology, Vol. 4, Issue 9, Sep. 2017
[4] Love Aggarwal, Varnika Gaur and Puneet Verma, “Design and Implementation of a Wireless Gesture Controlled Robotic Arm with Vision”, International Journal of Computer Applications, Vol. 79, Oct. 2013.
[5] Pravin Vaishnav and Shalini Tiwari, “Accelerometer Based Hand Gesture Controlled Robot”, International Journal of Science and Research, Vol. 4, Issue 3, March 2015.
[6] R. Raja Prabhu and R. Sreevidya, “Design of Robotic Arm based on Hand Gesture Control System using Wireless Sensor Networks”, International Research Journal of Engineering and Technology, Vol. 4, Issue 3, March 2017.
[7] Pradeep and Victer Paul, “Design and Implementation of Gesture Controlled Robotic Arm for Industrial Applications”, International Journal of Advanced Scientific Research and Development, Vol. 3, Issue 4, Oct. 2016.

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[8] Sakshi Sharma and Piyush Yadav, "Design and Implementation of Robotic Hand Control using Gesture Recognition", International Journal of Engineering Research and Technology, Vol. 6, Issue 4, Apr. 2017.

[9] Maruthi Sagar, Sai Manikanta Kumar and Geethanjali, "MEMS Based Gesture Controlled Robot Using Wireless Communication", International Journal of Engineering Trends and Technology, Vol. 4, Issue 4, Aug. 2014.

[10] Maruthi Sagar, Sai Manikanta Kumar and Geethanjali, "MEMS Based Gesture Controlled Robot Using Wireless Communication", International Journal of Engineering Trends and Technology, Vol. 4, Issue 4, Aug. 2014

[11] Gaurav Gautam and Abhijeet Ashish, "Wirelessly Hand Glove Operated Robot", International Journal of Advanced Research in Electronics and Communication Engineering, Vol. 3, Issue 11, Nov. 2014

[12] Roy, Kathika, et al. "Flex sensor based wearable gloves for robotic gripper control." *Proceedings of the 2015 Conference on Advances In Robotics*. 2015

[13] Vignesh, T., et al. "Design and Fabrication of 6-axis Gesture Controlled Robot." *2019 5th International Conference on Advanced Computing& Communication Systems (ICACCS)*. IEEE, 2019

[14] Zaidan, Alaa Hussein, Mousa K. Wail, and Amer Atta Yaseen. "Design and Implementation of Upper Prosthetic Controlled remotely by Flexible Sensor Glove." *IOP Conference Series: Materials Science and Engineering*. Vol. 1105. No. 1. IOP Publishing, 2021

[15] Mohith, S., S. Santhanalakshmi, and M. Sudhakaren. "Gesture and Voice Controlled Robotic Car using Arduino." *International Research Journal in Advanced Engineering and Technology (IRJAET)* (2018)

[16] Fegade, Toshika, et al. "Wireless gesture controlled Semi-Humanoid Robot." *2016 International Conference on Recent Advances and Innovations in Engineering (ICRAIE)*. IEEE, 2016

[17] Manoharan, Setal. "Gesture control of home appliances using flex sensor." *Annals of the Romanian Society for Cell Biology* (2021): 4442-4448

[18] Mapuskar, Aishwarya, et al. "Robot controlled using hand motion recognition." *Int. Res. J. Eng. Technol* 4.4 (2017): 424-427

[19] P. Pande, N. Ubale, D. Masurkar, N. Ingole and P. Mane, "Hand Gesture Based Wheelchair Movement Control for Disabled Person Using MEMS", International Journal of Engineering Research and Applications (IJERA), vol. 4, no. 4, pp. 152-158, 2014

[20] G. Soni, V. Poddar, Y. Sahu and P. Suryawanshi, "Hand Gesture Recognition Based Wheel Chair Direction Control Using AVR Microcontroller", International Journal of Advanced Research in Computer and Communication Engineering, vol. 5, no. 3, pp. 344- 348, 2016

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