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IMPLEMENTATION PAPER FOR BIO HAZARD WASTAGE DISPOSAL BY USING WIRELESS HUMANOID ROBOTIC ARM

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Abstract -In this research, a six axis robot manipulator arm is designed and constructed for industrial applications. Then the robot arm and the base rover are controlled by a single unit Raspberry Pi. The robotic Arm and its application using the object sorting and the controlled position mode's by user which presented in this project. Focusing on the robot controlled system, the specific angular motion of each joint so that robot arm can move to desired locations with high accuracy even with load variation. Such architecture has been used to test compliance strategies; specifically, this work shows the implementation of sorting an object by demonstration based on manual guidance using a force/torque (F/T) stepper motor and a wireless android or a pc interface. In Earlier Systems Mobile Robotic Arm Control was not there. Only Rover or Fixed Robotic Arm was only founded and invented. The Modern Robotic Arm was manufactured by using the Vacuum tubes. In some of the previous projects Robot Hand design only designed and it can be controlled by mechanical during that time there is no proper software interface and in some of the projects robot design using alloy was made.

Keywords – Raspberry pi, robotic arm, hazardous, Sensors.

I. INTRODUCTION

Robotic manipulators and robotic arms were the very first robots to be used in industry (they have been in use since the 1960s). Although the robotic arm was designed for manufacturing and production processes, it has long been used for other purposes and researchers. A large number of Studies have focused on robots for helping individuals with the continued progress in computing power, computer vision, and advanced sensors, research have started to focus on uses of robotic arms in daily life and work environments in project.

In general a robotic arm is a mechanical arm which is programmable and functions like a human arm. The robotic arm is used to perform complex tasks in place of human beings and it is capable of doing tasks like welding, shielding, sorting gripping spinning etc. In recent years the usage of robotic arm has increased because the tasks are easily performed by them with no errors when compared to human beings. Nowadays the presence of human being is required in hazardous area, which is a life threat to them. Among many opinions and discussions of using robots the most important is to shield people from such dangerous situations, in such cases robots can be used for handling hazardous materials like radioactive substance, so here in our project we have implemented a robotic arm instead of human beings to handle situations in hazardous environments.

A locomotion robot can replace human to do work. The robot is controlled wirelessly to ensure it can be used a long way from the user. This project describes the build of a real time mobile robot system based on using internet communication. Through this the human need not be present in that place and can make use of the arm connected to the wireless network do their work which prevents them for inhaling the
Toxic gases which are released through the substances thereby saving human life's and also the human can monitor the robotic arm consistently through online video streaming.

The mobile robot can be controlled by web page programmed in JavaScript language. Necessary programs are installed to run server and camera correctly, and then the system is connected wirelessly. Mobile robots are those which are designed to move on ground. Mobility gives a robot a much greater flexibility to perform new, complex, exciting tasks. The robots can move where needed. Fewer robots can be used. Robots with mobility can perform more natural tasks where the environment is not designed especially for them. These robots can work in a human-centered space and cooperate with men by sharing a workspace together. This can also be implemented in the oil rig felids where it can save people from major explosions by making them stay away from their work place and doing their work from a certain distance away.

II. LITRATURE SURVEY

SNO	TITLE	AUTHOR	CONCEPT	YEAR	ADVANTAGE
1	Humanoid Robot Arm for Intelligent Haptic Interaction with the Environment.	Dzmitry Tsetserukou , Naoki Kawakami and Susumu Tachi	The purpose was to increase the robot functionality and also to achieve the human like interactions by performing tasks in broad variety of environment. Intelligence variable admittance control and reflex action based impact control were used to realize smooth, safe and natural human –robot interaction.	2007	A whole-sensitive robotic arm iSoRA was developed to provide human like capabilities in variety of environment.
2	Extracting scientific results from robotic arm support operations: A technique for estimating the density and composition of rocks on Mars	BradleyJ. Thomson, PeterH. Schultz, and Nathan T. Bridges	The concept of this project is using a robotic arm in planets such as mars to analyze the surface samples and by displacing a sampling arm near it , its physical properties and volume of mass is calculated.	2008	We can estimate the density and composition of rocks in mars.
3	A Geometric Approach for Robotic Arm Kinematics with Hardware Design, Electrical Design, and .Implementation	Kurt E. Clothier and Ying Shang	The main concept used in this project is to find whether the discovered objects are capable of manipulating or not they have used geometric approach to solve unknown joints angles which is required to find the autonomous positioning, mainly based on trigonometric complex functions.	2010	The advantage is that the geometric approach can be easily modified for similar robotic architectures and has a capability of local autonomy to control a system manually.

4	Design and development of a competitive low cost robotic arm with four degrees of freedom	Ashraf Elfasakhany, Eduardo Yane, Karen Bayne Ricardo salgado	The main concept involves the use of robotic arm which is comparatively low cost and has a lab view, designed with four degrees of freedom to accomplish simple tasks such as light material handling.	2011	The advantage of using lab view is that it is easy to communicate properly with micro controller.	Several test process are to be carried out.
5	Design, Analysis and Implementation of a Robotic Arm-The Animator	Md. Anisur Rahman1 , Alimul Haque Khan , Dr. Tofayel Ahmed , Md. Mohsin Sajjad	The purpose is to create a humanoid robot not only have the form and structure of human beings but also behavior regarding the motion communication and behavior .The arm is designed in such a way that it can pick an object from one place to another place and it can be used in the industrial applications.	2013	Fastest completion time with lowest errors.	The approach does not concern the dynamics of the robot arm.
6	Android operated educational robot arm with 6 DOF	Neerparaj rai, Palzor gyatso bhutia,udit pradhan	The robotic arm is designed in such a way that it can pick an object from one place and place it in the desired location by through Bluetooth communication. Initially the robot arm is made to completely memorize the trajectory and	2014	The robot can be controlled through the smart phone .	The distance is restricted since it uses Bluetooth as the mode of communication.

			continuously follows the same on the target.			
7	Humanoid Robotic Arm for Tactual Interaction with Industrial Environment by using Mobile	Golap Kanti Dey,Palash Kanti Dey,Moham mad Hassan Ul Islam	The main aspect of the project is to build a humanoid robot ic arm from the garbage materials that can be used for daily life and industrial purpose especially in risky situations.	2014	The advantage is that garbage materials can be used to make the robotic arm and the arm can be used to lift heavy weight materials.	The disadvantage is ,it uses 5 dc motors and there is no live video streaming.
8	Design and Analysis of Robot Arm using Matlab & ANYSYS	Ramanideept hi Tanneeru Ajay Jandrajupalli B. Kiran Kumar	The main concept involved in this paper is the use of design control algorithm and MATLAB software which can be used in many fields such as hazard environment, tele medicine and missile.	2015	Remote control is easy to access from desired locations.	The disadvantage here is it needs internet connection and there is no live streaming for the process.
9	Implementation of wireless gesture controlled robotic arm	Saurabh A. Khajone , Dr. S. W. Mohod , V.M. Harne	The aim is to eradicate the use of buttons or joysticks for controlling the robots and use an intuitive technique by controlling the robotic arm by hand gesture. The system identifies the hand gesture performed in-front of webcam and transmits the signal wirelessly through RF module to the robotic arm and the arm performs the actions at the	2015	By using Hand gesture the robotic arm performs the actions instead of using remote or buttons to control them.	The method implements only one hand gesture and the hand must be kept properly against webcam otherwise the gesture are not recognized properly.

			receiving end.			
10	**Hand Gesture Based Wireless Robotic Arm Control for Agricultural Applications**	Rajesh Kannan Megalingam, Shiva Bandhyopadhyay, Gedela Vamsy Vivek, Muhammad Juned Rahi	This paper is implemented in the agricultural fields where robotic arm can be used in place of humans to plant and pluck fruits control it remotely using hand glove fixed with various sensors. The user wear the glove and the camera attached over the rover images/video the felid to the user and they can collect the harvested fruit in the basket attached to the rover.	2017	This can be used in the agriculture sector where the user will be in the control room rather than the field and can control the arm.	This project has to be implemented in the real time scenario.

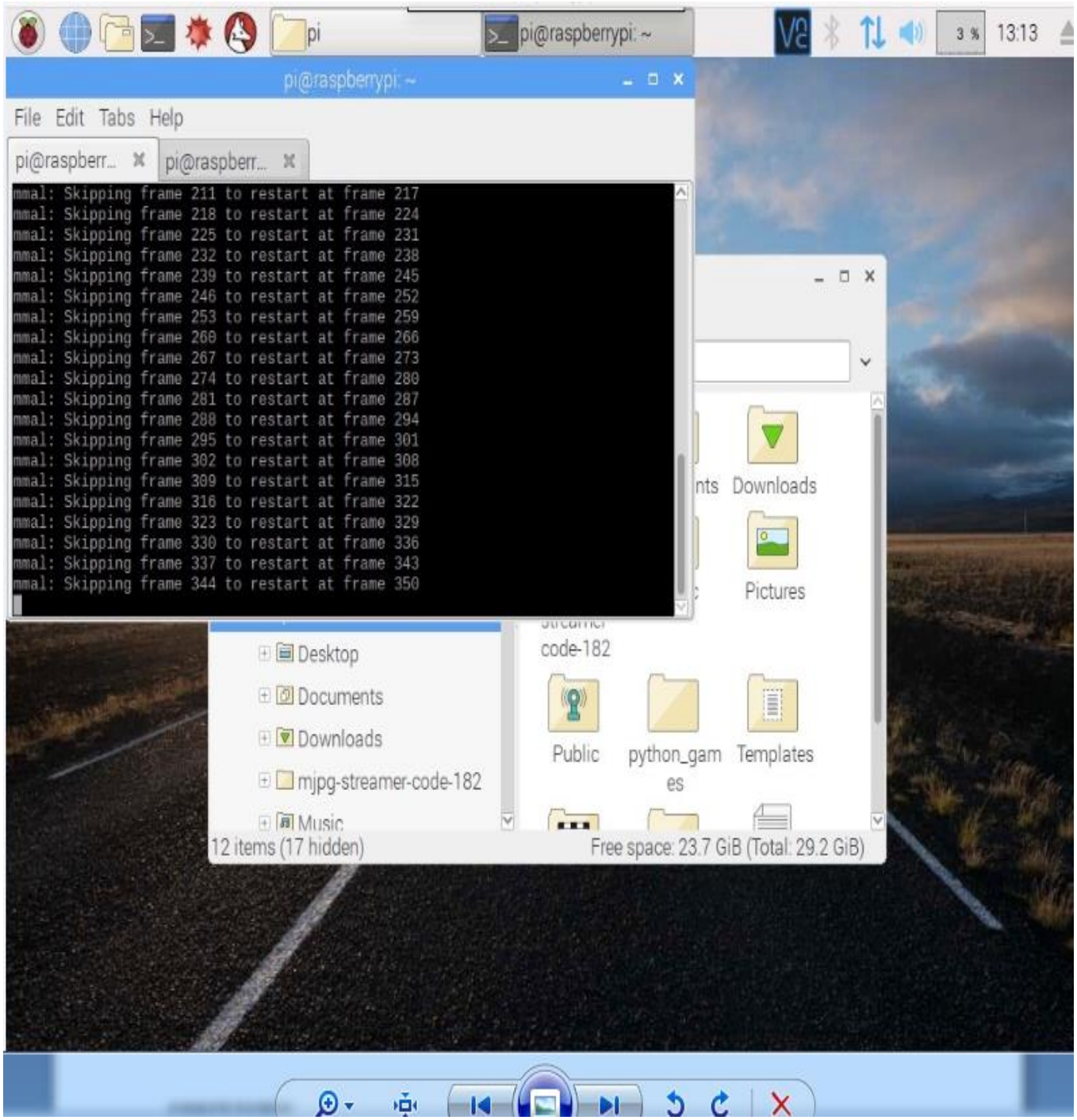
III. PROPOSED WORK

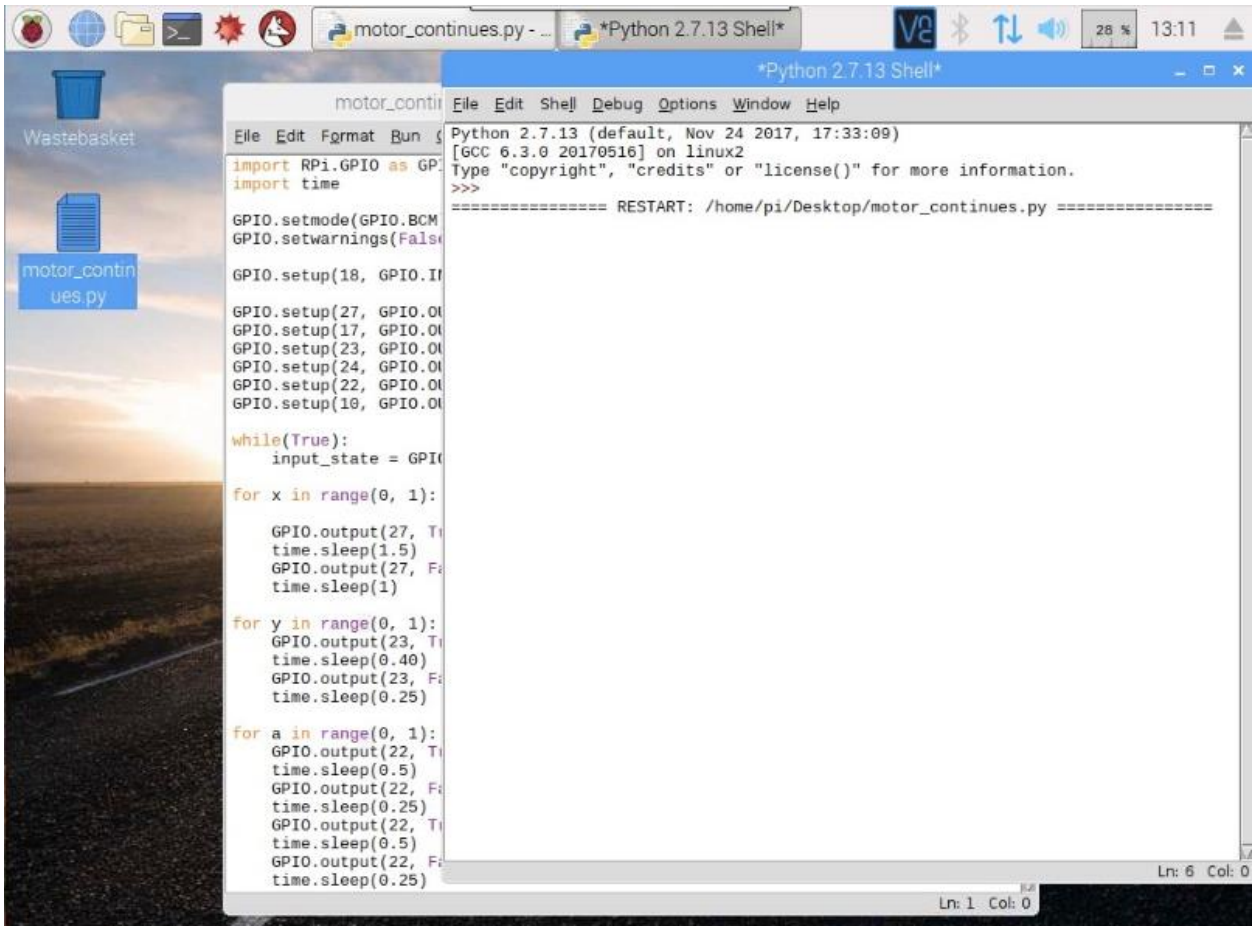
In the proposed system we built a real time mobile robot system based on using internet communication. This project shows how to implement mobile robot system by interface the microcomputer (Raspberry Pi). The Raspberry Pi is programmed in python language, the mobile robot system contain camera moving in two axes and 5-DOF arm robot to hold objects. The mobile robot can be controlled by web page programmed in JavaScript language.

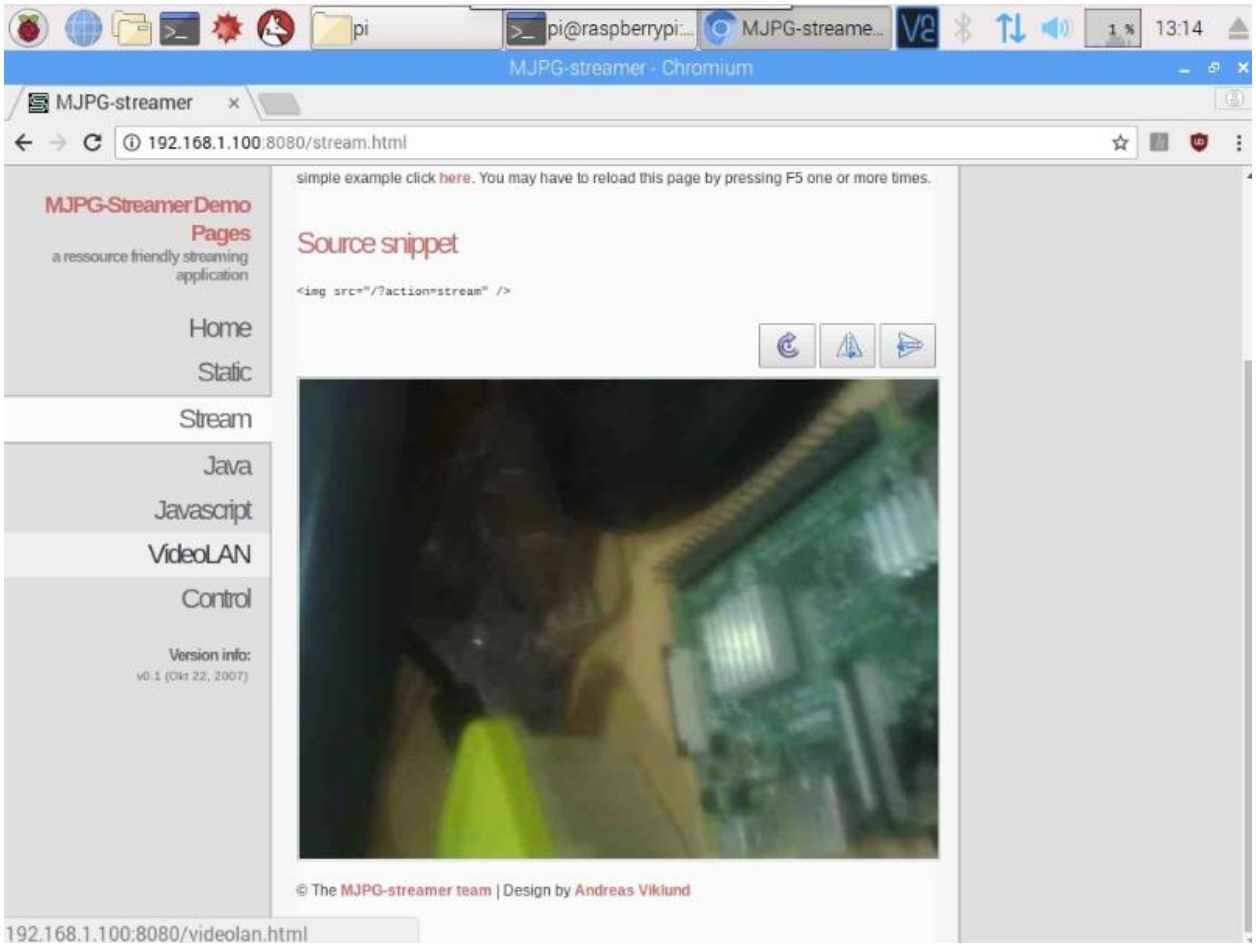
Necessary programs are installed to run server and camera correctly, and then the system is connected wirelessly. Mobile robots are generally those robots which can move from place to place across the ground. Mobility give a robot a much greater flexibility to perform new, complex, exciting tasks. The world does not have to be modified to bring all needed items within reach of the robot.

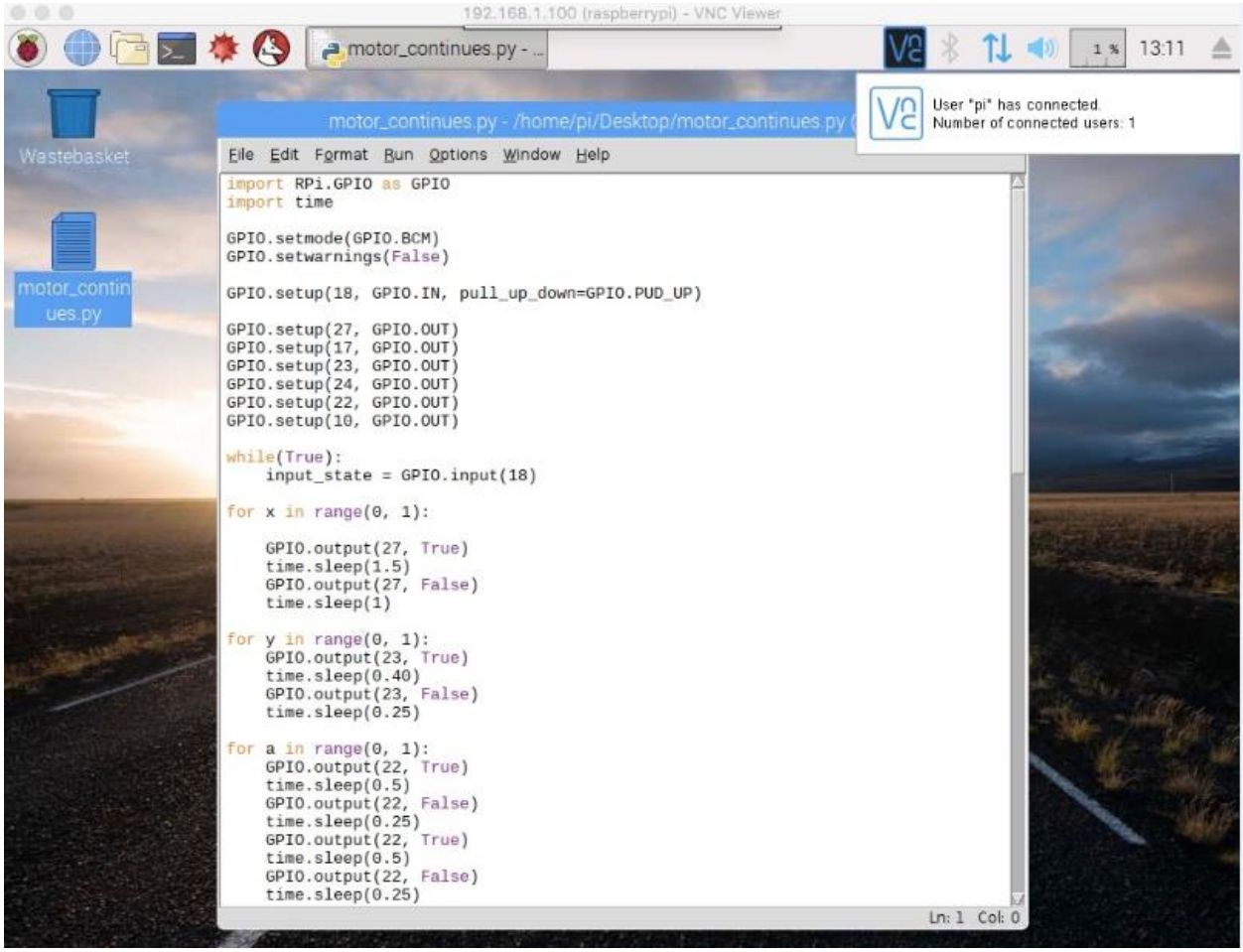
The robots can move where needed. Fewer robots can be used. Robots with mobility can perform more natural tasks in which the environment is not designed especially for them. These robots can work in a human-centered space and cooperate with men by sharing a workspace together. A CCD camera is mounted on the mobile robot to acquire information, which is displayed inside the browser for the remote operator's operation. The designed mobile robot can be remotely operated from 500 meters long as there is a set of computers with keyboard, mouse, display and connection to the Internet.

IV. IMPLEMENTATION









CONCLUSION

This project is effectively useful in the hazardous areas where there is lot of risks to human life and many dangerous situations can cause rapid destruction and it also Improves the practical usability of the hand gesture based controls which can be controlled wirelessly through a remote or by an application installed in the users mobile.