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Coffee Maker Robotic Arm

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Abstract: ***Now a days every fields are getting smarter and smarter. People looks for more ease and comfort in there life. For the ease and comfortness of the life everyone is looking for automation of everything of there life. That's the reason why the new edge technologies are given for importance. These new edge technology are emerging very fast. One of the advantage of these technologies is giving more comfort and ease to do daily activities. Robotics is one of such kind of technology which is gaining lot of importance in various activities of life. The use of industrial robots are increasing day by day in the field of food, consumer goods, plastics and electronics, but is still mostly concentrated in the automotive industry. The aim of coffee maker robotic arm has developed a concept of a lightweight robot using lightweight materials such as pvc pipe, ACP sheet and aluminium.***

I. INTRODUCTION

Robots is now a day are very much in the treads of new technologies. People are in the race of finding solutions in every aspect of life with the help of robots. One of the latest trend is to use robots in food industry. Robots are ferment javas is the latest technology trend working towards eliminating labor shortages and diminishing ever increasing workforce-related expenses. Unmanned cafes and bars, furnished with similar mechanism, are not mere dreams about the future anymore. The devices are already being tested in interaction with real people in the United States, China, and Taiwan—at stores, food outlets, cafes, etc. In the food industry, it seems, the robot revolution are well underway with machines mastering skilled tasks that have been performed by people. In Boston, robots have replaced chefs. In Prague, machines taking orders through an app are dislodge and serves. In Denver, they're taking orders at fast-food drive-through robots, taking charge of an art that has remained in human hands for thousands of years. Removing the human efforts from ordering a cup of coffee is one of the company's selling points.

II. PROBLEM STATEMENT

To enhance the productivity in various industry using automation and resolve issues regarding workers. The project is designed to prove development of robotic arm in core technology and the plate form of other teams to use in feature. The control is accomplished through feedback control based on variety of different sensors. The complexity of control becomes obvious as soon as one become a robotic arm with small fraction of human dexterity. This project takes the liberty to design and implement an effective automation system to achieve this specific task without any work force in order to demonstrate the importance of automation technology. However, the design must be a simple and cost effective system. Therefore, this project was designed for simple 4 axis robotic arm to achieve the task.

III. LITERATURE REVIEW

In this paper, The design methodology involves the hardware, software part and implementation of both designs The results obtained were very satisfactory. The use of Robotic arm is highly recommended for industries especially for safety and productivity reasons [1] .This paper also discusses an approach for demonstration of a robot arm for people who cannot easily lift simple things such as lifting a glass of water [2]. We had described a formalization of the robot manipulation learning problem that blend existing research into a single coherent framework and intensify various research opportunities and challenges [3]. From this robotic arm the exploration of afterwards will be a full body which is controlled by body switch. The final step of this robot is auto learner, in this stage this robot can learn automatically [4]. The increased use of high DOF robots that must perform tasks in real time in complex dynamic environments spurs the need for fast motion planning algorithms we discuss several types of strategies for motion planning in high dimensional spaces and dissect some of them, namely grid search based, sampling based and trajectory optimization based approaches [5]. In this paper, a novel method for continuous path refinement that uses covariant gradient techniques to improve the quality of sampled trajectories. This paper had optimized technique which converges over a wide range of input paths and is able to optimize higher-order dynamics of trajectories than previous path optimization strategies[8].

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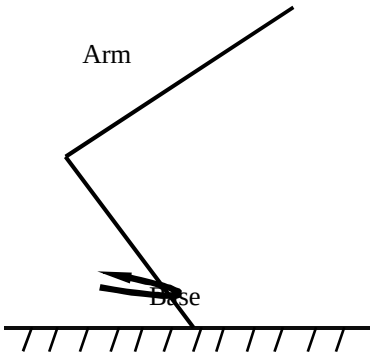
IV. DESIGN OF LINKS

A. Movement Diagram

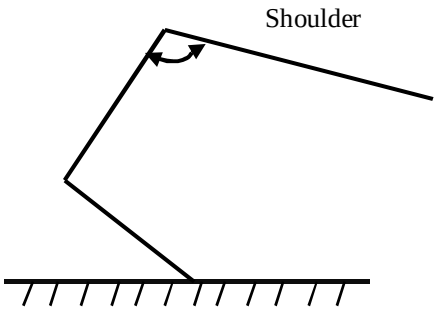
Number of Movement (DOF) = 4

1) Base movement (180^0)
2) Shoulder Movement (150^0)
3) Wrist Movement (150^0)
4) Clove (Gripper) Movement (65^0)

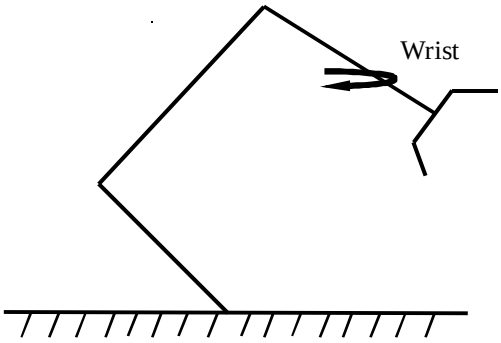
1) Base Movement



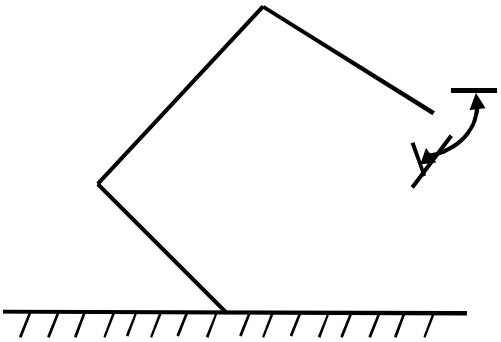
2) Shoulder Movement



3) Wrist Movement

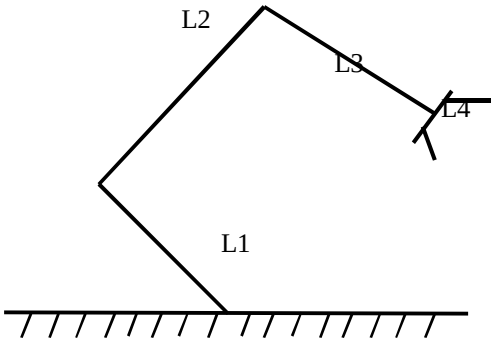


4) Clove (Gripper) Movement



B. Link Details

1) Total number of Link = 4



V. WORKING

The working principal of the robot is based on the pick and place process In the food industry, it seems, the robot revolution is well underway, with machines mastering skilled tasks that have always been performed by people. robots have replaced chefs and creating complex bowls of food for customers. Now in coffee maker robotic arm ,the robot will pick the glass and put it on conveyor belt ,at this point the belt is in stationary position then the arm pick another glass which is placed at certain distance from robotic arm assembly and tilt accordingly .the glass is filled with the milk .similarly the robotic arm will pick the glass of sugar and coffee which is placed in different glass at particular distance and tilt in glass which are at conveyor .the operation of picking the sugar coffee , milk are done with the help of coding. When all the ingredients are put in glass which is at conveyor belt then the robotic arm pick the steering mechanism. the arm consist of two gripper ,first to hold the cup and another to perform the steering mechanism . as the process is complete the steer get pick up and rotate in cup of water to get clean .in this way the safety factor are also take into consideration .after all this operation the conveyor will start and cup of coffee will reach at customers and the customers will enjoy the brew taste of coffee

VI. CONCLUSION

The objectives of coffee maker robotic arm has been achive which was to develop the hardware and software for an accelerometer controlled robotic arm. From observation that has been conclude , it clearly shows that the movement is very precise, accurate, and is easy to control and user friendly to use. It is inexpensive and the cost of building robot is low. Hence this robots can be installed in any café. Exploiting common-sense physical knowledge Better algorithms for transfer across substantially different families of tasks Drastically improving the sample complexity of policy learning algorithms, while avoiding having to empirically tune hyper-parameters. The assistive robotic arm will must be able to contribute most of the challenges in our daily life. However, the resulting configuration is not guaranteed to be human-like.

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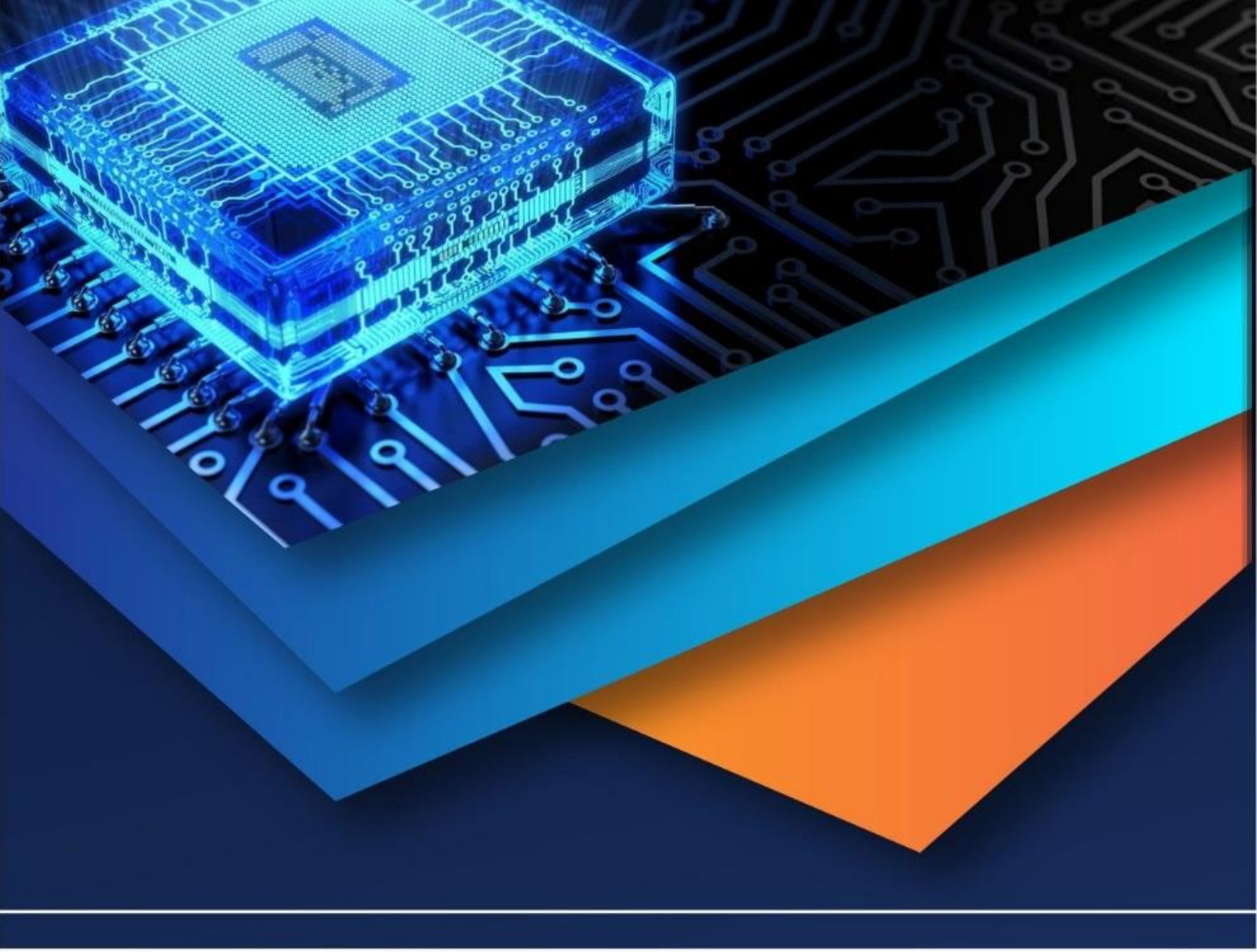

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