**CHAPTER 6**

**DISCUSSIONS, CONCLUSION AND FURTHER EXTENSION**

**6.1. Discussions**

This thesis has been successfully presented Arduino microcontroller based robotic arm control system using Bluetooth module and DC motors and servo motors. The robotics arm control system is designed using Arduino Mega board, motor driver (L298), Bluetooth module (HC06), DC motors, Servo motors. For this system, an Arduino Mega board is written on C programming language.

This robotics arm control system is successfully built which can be controlled with wireless technology using Bluetooth module from the android phone and this robot follows the command and moves to the desired location and performs picked and placed operation of items. The Arduino microcontroller circuit successfully processes the data from input circuit and controls the output circuit. The major advantages of this system involve easily and safety in a short span of time. For this design, hardware design can be changed by adding other electronic components and soft design can be changed by changing the appropriate program for advanced system.

**6.2. Conclusion**

The operating system of smart phone is android which can develop effective remoted control program. At the same time, this program uses Bluetooth connection to communicate with robot. It has proven to allow for meaningful two way communication between the Android phone and the robot which allows a non-expert to interact and adjust the functionality of a system. A single board microcontroller intended to make the application of interactive objects or environments more accessible. The surveillance has always been a quite sensitive task. And it includes so many risks. So, it is better to use robot for this job instead of people. And if users are able to control the robots with efficiency and accuracy then users can guarantee with good results and success. The system is a good step for secure surveillance using robots.

Wireless control is one of the most important basic needs for all people over the

world. But unfortunately, the technology is not fully utilized due to a huge amount of data and communication overheads. Generally, many of the wireless controlled robots use RF modules. But user’s project for robotic control makes use of Android mobile phone which is very cheap and easily available. The available control commands are more than RF modules. For this purpose, the android mobile user has to install a designed application on mobile.

**6.3. Further Extension**

Ultrasonic sensor can also be placed on the arm so that it can detect and simultaneously pick the object and keep it on other places. It can be extended for accurate holding and inspection application in the industries. It can be used for a picked and placed applications in industries like soap manufacturing pharmacy etc. The challenge for the feature has been analyzed and evaluated because more effort has gone into developing automated system to improve productivity than has gone into the appropriate matching of people technology. The versatility of the robots used in all the application is important, as in applying that capability efficiently. Future applications of robots have been explored and critical areas have been analyzed.