A

PROJECT SYNOPSIS

ON

“Embedded Robot Control System Based On an Embedded Operating System”



In the partial fulfillment of **Master Technology in Electronics**

**Technology** under the Faculty of Technology

By

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**Under the guidance of**

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CERTIFICATE

This is to certify that, **Mr. Vikram Balu Galphade**, the student of M.Tech (Electronics Technology) have satisfactorily completed her seminar work entitled

“Embedded Robot Control System Based On an Embedded Operating System”

During the year 2012-2013 to our satisfaction & submitted the seminar report in the partial fulfillment of the requirement for the award of the degree of **MASTER OF TECHNOLOGY** in **ELECTRONICS** **TECHNOLOGY** prescribed by International School of Engineering & Technology, Shivaji university, Kolhapur. Maharashtra state under the curriculum of masters degree course, as a record of student own work carried out by her under our supervision & guidance.

**Prof. P. C. Bhaskar Prof. S. B. Chavan**

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**Shivaji University, Kolhapur.**

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**Mr. Vikram Balu Galphade**

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* ***INTRODUCTION:***

By the advancement of electronics, embedded technology has become a challenging field in this modern age. The single functioned; tightly constrained, reactive and real-time feature of these devices enhanced its importance in industrial, consumer applications. In this paper, the configuration of the embedded system is introduced. It presents a robot control system based on an embedded operating system and ARM. Based on the combination of advanced RISC microprocessor (ARM), this paper involves development of embedded robot control systems through Wi-Fi. The design of embedded control system includes four aspects, i.e., system structure, functions, hardware, and software design. Fixed instruction width of 32 bits to ease decoding and pipelining, at the cost of decreased code density is the feature of RISC. In the development of the system, some features are included such as hierarchy structure, modular hardware, and structured software, to make the system suitable for a variety of robots applications through some hardware adjustment and software customization only. The effectiveness of proposed approach has to be verified and tested.

As more advanced control algorithms are becoming available for the control of robotic arms, traditional fixed controller boards and associated code generators are becoming less convenient way to test such control algorithms in real-time. The process of using such boards is complex, time consuming, and inflexible. By the advancement of electronics, embedded technology has become a challenging field in this modern age. The single functioned; tightly constrained, reactive and real-time feature of these devices enhanced its importance in industrial, consumer applications.

When networking technology is incorporated with the former, there is no doubt that the scope of embedded systems would be further more. Electro-mechanical device that performs various tasks ranging from simple mechanical jobs to highly complex tasks. It can be used to pick and place small parts on a production line. The robot arm using in this paper was designed with DC motors which are driven by the driver circuit and controlled by the control circuit. The controller used in this paper was based on ARM processor.

Existing system robot generally works with microcontroller and it is basically wired robots which works on CISC microprocessor. Proposed System introduces the configuration of the embedded system, and then presents a robot control system based on an embedded operating system and ARM. Based on the combination of advanced RISC microprocessor (ARM), this project involves development of embedded robot control systems through Wi-Fi. Here we use ARM controller as the heart of the system. ARM has high speed of execution and powerful information processing capability. The capacity of multi-parameter execution, multi-level monitoring and networking of ARM processor makes it suitable for a wide variety of networking applications.

Conventional PC web servers require uninterrupted 230V A.C power supply round the clock and the implementation and maintenance of these bulky systems are very high. When this is replaced by the low power embedded web server, the power consumption could be highly reduced since it requires only a low D.C power supply of 3.3V. The system designed here is an example of embedded technology integrated with networking technology where communication and processing technology meets. Firmware development is done in embedded C language which is user friendly and also enhances the future development of the system. EWS with external Ethernet Controller for user access is designed using Visual Basic and for EWS with integrated Ethernet is designed using HTML.

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