

AUTOMATIC IRRIGATION SYSTEM WITH ANDROID APPLICATION

A MINI PROJECT REPORT

Submitted by

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In partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONIC ENGINEERING

T.J.S. ENGINEERING COLLEGE, PERUVOYAL

ANNA UNIVERSITY: CHENNAI 600 025

JUNE 2022



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BONAFIDE CERTIFICATE

Certified that this mini project report "AUTOMATIC IRRIGATION SYSTEM WITH ANDROID APPLICATION" is the bonafide work of the following students.

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Who carried out the mini project work under my supervision


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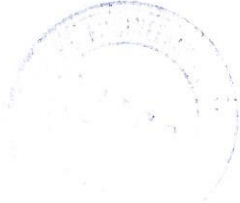
T.J.S. Engineering College,


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Submitted for viva voce held on 21/06/2022 at T.J.S. Engineering College, Peruvoyal.


INTERNAL EXAMINER
21/6/22

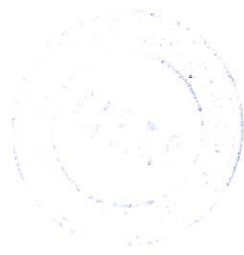

EXTERNAL EXAMINER
21/06/22




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ABSTRACT

The efficient irrigation management practices based on the monitoring of the moisture in the soil provide a great benefit for the appropriate amount of water applied in the fields. This project presents design and development of a soil moisture sensor and a response monitoring system. The probes used in this sensor are made of nickel which is an anti-corrosive and robust material for use in agricultural related applications. The response monitoring system measure the moisture of the soil, compare it with the desired values given by the user and generate alert if soil moisture goes below desired value. It helps in problems related to growing of crops in which irrigation is required at irregular interval. It is also helpful in monitoring of soil moisture in golf fields. Introduction India is a developing nation with a very large population. Due to increasing population, the basic need such as food and water is increasing day by day. Thus there is a need of saving these resources and utilize them in an efficient manner. Since water is one of the most important elements in our daily life, thus we must use efficient ways to utilize water and save it for future generations. One of method is efficient irrigation management practices for fields. Irrigation water management practices could greatly benefit by the knowledge of moisture in the soil. To determine the soil moisture we have designed and developed a nickel probes based soil moisture sensor and a response monitoring system. By knowing the moisture value, we can estimate when to water and how much to water the fields so that there is no over-watering.



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EMBEDDED SYSTEMS

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OBJECTIVES:

To impart knowledge on the following Topics

- Building Blocks of Embedded System
- Various Embedded Development Strategies
- Bus Communication in processors, Input/output interfacing.
- Various processor scheduling algorithms.
- Basics of Real time operating system and example tutorials to discuss on one real time operating system tool.

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS 9
Introduction to Embedded Systems -Structural units in Embedded processor , selection of processor & memory devices- DMA - Memory management methods- Timer and Counting devices, Watchdog Timer, Real Time Clock, In circuit emulator, Target Hardware Debugging.

UNIT II EMBEDDED NETWORKING 9
Embedded Networking: Introduction, I/O Device Ports & Buses- Serial Bus communication protocols RS232 standard - RS422 - RS 485 - CAN Bus Serial Peripheral Interface (SPI) - Inter Integrated Circuits (I²C) -need for device drivers.

UNIT III EMBEDDED FIRMWARE DEVELOPMENT ENVIRONMENT 9
Embedded Product Development Life Cycle- objectives, different phases of EDLC, Modelling of EDLC; issues in Hardware-software Co-design, Data Flow Graph, state machine model, Sequential Program Model, concurrent Model, object oriented Model.

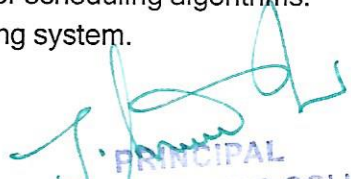
UNIT IV RTOS BASED EMBEDDED SYSTEM DESIGN 9
Introduction to basic concepts of RTOS- Task, process & threads, interrupt routines in RTOS, Multiprocessing and Multitasking, Preemptive and non-preemptive scheduling, Task communication shared memory, message passing-, Inter process Communication - synchronization between processes-semaphores, Mailbox, pipes, priority inversion, priority inheritance.

UNIT V EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT 9
Case Study of Washing Machine- Automotive Application- Smart card System Application-ATM machine -Digital camera

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to understand and analyze Embedded systems.
- Ability to suggest an embedded system for a given application.
- Ability to operate various Embedded Development Strategies
- Ability to study about the bus Communication in processors.
- Ability to acquire knowledge on various processor scheduling algorithms.
- Ability to understand basics of Real time operating system.

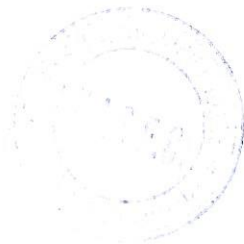

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TEXT BOOKS:

1. Peckol, "Embedded system Design", John Wiley & Sons, 2010
2. Lyla B Das, "Embedded Systems-An Integrated Approach", Pearson, 2013
3. Shibu. K.V, "Introduction to Embedded Systems", 2e, Mc graw Hill, 2017.

REFERENCES:

1. Raj Kamal, 'Embedded System-Architecture, Programming, Design', Mc Graw Hill, 2013.
2. C.R.Sarma, "Embedded Systems Engineering", University Press (India) Pvt. Ltd, 2013.
3. Tammy Noergaard, "Embedded Systems Architecture", Elsevier, 2006.
4. Han-Way Huang, "Embedded system Design Using C8051", Cengage Learning, 2009.
5. Rajib Mall "Real-Time systems Theory and Practice" Pearson Education, 2



A handwritten signature in blue ink, appearing to be "J. S. Kumar".

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