AUTOMATIC SELF DRIVEN TRAIN USING MICROCONTROLLER WITH OBSTACLE DETECTION SYSTEM

A PROJECT REPORT

Submitted by

MANOJ KUMAR S	**112818106015**
PAMUJULA NAVEEN	**112816106020**
RAGHUL VIJAY R	**112816106024**
RAJESH V	**112818106026**

In partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

T.J.S. ENGINEERING COLLEGE, PERUVOYAL, CHENNAI

PRINCIPAL
T.J.S. ENGINEERING COLLEGE
Peruvoyal, Kavaraipettai,
Gummidipoondi Taluk,
Thiruvallur Dist - 601 206.

ANNA UNIVERSITY: CHENNAI 600 025

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BONAFIDE CERTIFICATE

Certified that this project report "AUTOMATIC SELF DRIVEN TRAIN USING MICROCONTROLLER WITH OBSTACL DETECTION SYSTEM." is the bonafide work of the following students

MANOJ KUMAR S	112818106015
PAMUJULA NAVEEN	112816106020
RAGHUL VIJAY R	112816106024
RAJESH V	112818106026

who carried out the project work under my supervision.

SIGNATURE

DR.S.VELMURUGAN,M.E, PhD

HEAD OF THE DEPARTMENT

Department of Electronics and Communication Engineering,
T.J.S. Engineering College,
Peruvoyal, Chennai

SIGNATURE

MRS.G.BHAVANI.M.E

ASSISTANT PROFESSOR

Department of Electronics and Communication Engineering,
T.J.S. Engineering College,
Peruvoyal, Chennai

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

Now a days train cannot run without man power , if any medical risk happens for driver, it is less safety for passengers travelling inside the train .And it requires more cost for human labour. In the existing System the train does not stops when it finds any obstacles at the front. It occurs very risk to the passengers travelling inside the train. The main objective is to prevent Human errors and see how security can be increased. By using sensors, and by today's technologies. To increasing the rate of arriving trains, or running services outside the usual hours, there are no extra costs in human labour. By removing the driver from the train, the human-risk factor is reduced and overall safety and reliability of the system increases. The trains are effectively monitored and controlled by staff based in a remote control centre. The system we introduce here is fully automatic train .we introduced it to prevent train accidents. The train stops in every station for a particular time period .It opens and closes the door automatically.Before closing the door it will be indicated by buzzer sound .Here we are indicated the open and closing of doors by led on and off. In this proposed system we can control our train from direct control room by the use of RF transmitter and RF receiver.and here we also introduced the LDR which is used to save the power. We also introduced obstacle avoiding sensor IR (Infra-Red) sensor which stops the train automatically when the sensor finds the obstacle

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EC8391 CONTROL SYSTEMS ENGINEERING **L T P C**
3 0 0 3

OBJECTIVES:

- To introduce the components and their representation of control systems
- To learn various methods for analyzing the time response, frequency response and stability of the systems
- To learn the various approach for the state variable analysis.

UNIT I SYSTEMS COMPONENTS AND THEIR REPRESENTATION **9**

Control System: Terminology and Basic Structure-Feed forward and Feedback control theory Electrical and Mechanical Transfer Function Models-Block diagram Models-Signal flow graphs models-DC and AC servo Systems-Synchronous -Multivariable control system

UNIT II TIME RESPONSE ANALYSIS **9**

Transient response-steady state response-Measures of performance of the standard first order and second order system-effect on an additional zero and an additional pole-steady error constant and system- type number-PID control-Analytical design for PD, PI,PID control systems

UNIT III FREQUENCY RESPONSE AND SYSTEM ANALYSIS **9**

Closed loop frequency response-Performance specification in frequency domain-Frequency response of standard second order system- Bode Plot - Polar Plot- Nyquist plots-Design of compensators using Bode plots-Cascade lead compensation-Cascade lag compensation-Cascade lag-lead compensation

UNIT IV CONCEPTS OF STABILITY ANALYSIS **9**

Concept of stability-Bounded - Input Bounded - Output stability-Routh stability criterion-Relative stability-Root locus concept-Guidelines for sketching root locus-Nyquist stability criterion.

UNIT V CONTROL SYSTEM ANALYSIS USING STATE VARIABLE METHODS **9**

State variable representation-Conversion of state variable models to transfer functions-Conversion of transfer functions to state variable models-Solution of state equations-Concepts of Controllability and Observability-Stability of linear systems-Equivalence between transfer function and state variable representations-State variable analysis of digital control system-Digital control design using state feedback.

TOTAL:45 PERIODS

OUTCOMES: Upon completion of the course, the student should be able to:

- Identify the various control system components and their representations.
- Analyze the various time domain parameters.
- Analysis the various frequency response plots and its system.
- Apply the concepts of various system stability criterions.
- Design various transfer functions of digital control system using state variable models.

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Ponneri Taluk,
Thiruvallur Dist - 601 206.