Self Driving Car using RaspberryPi

A PROJECT REPORT

Submitted by

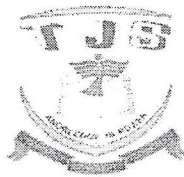**S.Y AHAMED ASIK**   **112818104901**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

T.J.S ENGINEERING COLLEGE, PERUVOYAL
PERUVOYAL (NEAR KAVARAIPETTAI)
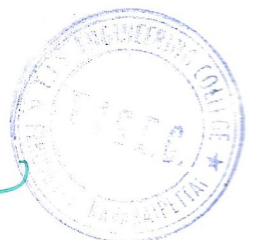
GUMMIDIPOONDI TALUK

THIRUVALLUR DISTRICT – 601206

Approved by AICTE and Affiliated to Anna University, Chennai

ANNA UNIVERSITY::CHENNAI 600 025

JUNE 2022

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

SELF-DRIVING CAR

ABSTRACT:

Self driving cars are autonomous vehicles which are capable of sensing the environment and move safely with little or no human intervention. The objective of this project is to build a self driving miniature robot car capable of driving in any road conditions and to follow traffic rules. It involves the use of artificial Intelligence and computer vision to drive the car autonomously. The processing unit of the robot car is raspberry Pi which controls the vehicle with the help of other hardware components such as arduino and motor driver shield. Pi camera senses the environment. Python opencv library is used to process the image, frame by frame and detect traffic signs and lanes in the surface of the road. Many existing algorithms like lane detection, obstacle detection are combined together to provide the necessary control to the car.

Keywords: Autonomous vehicle, raspberry Pi, self-driving car

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

ANNA UNIVERSITY : CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report "**SELF DRIVING CAR USING RaspberryPi**" is the bonafide work of "**S.Y AHAMED ASIK (112818104901)**" who carried out the project work under my supervision.

S.Y AHAMED ASIK

SIGNATURE

Dr.S.Anbu,M.E.,Ph.D.,

Professor and Head of the Department,

Department of CSE.

112818104901

SIGNATURE

SUPERVISOR

Mrs.Agnes,M.E.,

Assistant Professor,

Department of CSE.
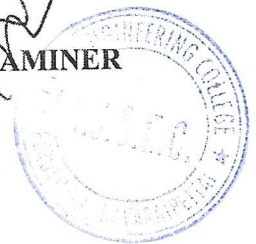
T.J.S ENGINEERING COLLEGE

PERUVOYAL (NEAR KAVARAIPETTAI)

GUMMIDIPOONDI TALUK

THIRUVALLUR DISTRICT – 601206

Submitted for viva voce held on 22|6|22 at T.J.S Engineering College, Peruvoyal.

INTERNAL EXAMINER

EXTERNAL EXAMINER

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

CS8691   ARTIFICIAL INTELLIGENCE

                                                    L T P C
                                                    3 0 0 3

OBJECTIVES:

- To understand the various characteristics of Intelligent agents
- To learn the different search strategies in AI
- To learn to represent knowledge in solving AI problems
- To understand the different ways of designing software agents
- To know about the various applications of AI.

UNIT I   INTRODUCTION   9

Introduction-Definition - Future of Artificial Intelligence - Characteristics of Intelligent Agents-Typical Intelligent Agents - Problem Solving Approach to Typical AI problems.

UNIT II   PROBLEM SOLVING METHODS   9

Problem solving Methods - Search Strategies- Uninformed - Informed - Heuristics - Local Search Algorithms and Optimization Problems - Searching with Partial Observations - Constraint Satisfaction Problems - Constraint Propagation - Backtracking Search - Game Playing - Optimal Decisions in Games – Alpha - Beta Pruning - Stochastic Games

UNIT III   KNOWLEDGE REPRESENTATION   9

First Order Predicate Logic - Prolog Programming - Unification - Forward Chaining- Backward Chaining - Resolution - Knowledge Representation - Ontological Engineering-Categories and Objects - Events - Mental Events and Mental Objects - Reasoning Systems for Categories - Reasoning with Default Information

UNIT IV   SOFTWARE AGENTS   9

Architecture for Intelligent Agents - Agent communication - Negotiation and Bargaining - Argumentation among Agents - Trust and Reputation in Multi-agent systems.

UNIT V   APPLICATIONS   9

AI applications - Language Models - Information Retrieval- Information Extraction - Natural Language Processing - Machine Translation - Speech Recognition - Robot - Hardware - Perception - Planning - Moving

                                                    TOTAL :45
                                                    PERIODS

OUTCOMES:

Upon completion of the course, the students will be able to:
- Use appropriate search algorithms for any AI problem
- Represent a problem using first order and predicate logic
- Provide the apt agent strategy to solve a given problem

- Design software agents to solve a problem
- Design applications for NLP that use Artificial Intelligence.

TEXT BOOKS:

7 S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, ThirdEdition, 2009.

8 I. Bratko, "Prolog: Programming for Artificial Intelligence", Fourth edition, Addison-WesleyEducational Publishers Inc., 2011.

REFERENCES:

16. M. Tim Jones, "Artificial Intelligence: A Systems Approach(Computer Science)", Jonesand Bartlett Publishers, Inc.; First Edition, 2008

17. Nils J. Nilsson, "The Quest for Artificial Intelligence", Cambridge University Press, 2009.

18. William F. Clocksin and Christopher S. Mellish," Programming in Prolog: Using the ISOStandard", Fifth Edition, Springer, 2003.

19. Gerhard Weiss, "Multi Agent Systems", Second Edition, MIT Press, 2013.

20. David L. Poole and Alan K. Mackworth, "Artificial Intelligence: Foundations ofComputational Agents", Cambridge University Press, 2010.

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