REAL TIME VIDEO OBJECT DETECTION USING DEEP LEARNING TECHNIQUES

A PROJECT REPORT

Submitted by

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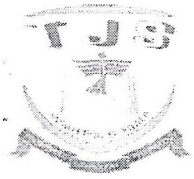
in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING



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BONAFIDE CERTIFICATE

Certified that this project report "**REAL TIME VIDEO OBJECT DETECTION USING DEEP LEARNING TECHNIQUES**" is the bonafide work of "***JEBASTI SANJANA.A(112818104020),MUGILA.K(112818104036), SUBHASHINI.A(112818104051)***" who carried out the project work under my supervision.

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Submitted for the viva voce examination held on 22.06.2022.

INTERNAL EXAMINER

EXTERNAL EXAMINER

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This paper deals with the design and implementation of "**Fast Deep Neural Networks with Knowledge Guided Training and Predicted Regions of Interests for Real-Time Video Object Detection**" using *Raspberry pi* and *Tensor flow*. This Project is Real Time Object Detection Using Tensor Flow Lite system has been developed to help visually impaired people for navigation and surrounding objects detection. This system is based on raspberry pi 3, a single board compute model and Tensor Flow lite framework. The algorithm developed is tested for detecting objects like [illegible], chair, a TV, a laptop, a mouse, a cell phone, a bottle etc. The Faster Region BasedConvolutional Neural Network model (Faster R-CNN) developed using tensor flow Lite. The processor was connected to a Raspberry Pi, Camera and Audio device. The processor was coded in python, a high level programming language, needed to process images in real time. The camera captures an image in real time which was processed by the Raspberry Pi-3 processorthe python code uses the R-CNN model to identify the obstacle with boxes and category index. The recognized image category was extracted and stored in a text file. The contents of the text file are converted to voice using the PYTTS to Speech module. This system is extremely flexible and can be used in any environment, without any priming. This system is capable of detecting people as well as objects. The detection accuracy of 85% is achieved. The testing is done in varying light, background, and distance in indoors as well as outdoor scenarios. This system uses quantized SSDLite-MobileNet-v2 object detection model, which is trained of the MSCOCO dataset and converted to run on TensorFlow Lite. The information regarding the detected object is converted into Audio for guiding the visually challenged person.

T.J.S.E.C.

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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:

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

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

REFERENCES:

6. M. Tim Jones, "Artificial Intelligence: A Systems Approach(Computer Science)", Jonesand Bartlett Publishers, Inc.; First Edition, 2008
7. Nils J. Nilsson, "The Quest for Artificial Intelligence", Cambridge University Press, 2009.
8. William F. Clocksin and Christopher S. Mellish," Programming in Prolog: Using the ISOStandard", Fifth Edition, Springer, 2003.
9. Gerhard Weiss, "Multi Agent Systems", Second Edition, MIT Press, 2013.
10. David L. Poole and Alan K. Mackworth, "Artificial Intelligence: Foundations ofComputational Agents", Cambridge University Press, 2010.

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