HUMAN OBJECT DETECTION AND TRACKING ON STREETS FOR ROAD SAFETY USING MATLAB

A project report submitted
in partial fulfilment of the requirement for the award of the degree of

Bachelor of Technology (Honors)

in

Electronics and Communication Engineering

by

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CERTIFICATE

This is to certify that this project report "HUMAN OBJECT DETECTION AND TRACKING ON STREETS FOR ROAD SAFETY USING MATLAB" is a bonafide record of work done by

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CANDIDATE' DECLARATION

We hereby declare that the work which is being presented and the project entitled "HUMAN OBJECT DETECTION AND TRACKING ON STREETS FOR ROAD SAFETY USING MATLAB" in partial fulfilment of the requirements for the reward of the degree of **Bachelor of Technology** in **Electronics and Communication Engineering** and submitted in the department of Electronics and Communication Engineering , NIT Jamshedpur is an authentic record of our own work carried under the esteemed supervision of **Amit Prakash, Associate Professor**, Department of Electronics and Communication Engineering , NIT Jamshedpur. The matter presented in this project has not been submitted by us for the award of any degree or diploma to other universities.

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This is to certify that above statement made by the candidates is true and correct to the best of our knowledge and belief. The work has been carried out by Karuturi Surya Sumanth, Jayanti Venkata Sai Kiran and Peddinti Naga Babu under my guidance.

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ABSTRACT

Object detection in videos involves verifying the presence of an object in image sequences and possibly locating it precisely for recognition. Object tracking is to monitor objects spatial and temporal changes during a video sequence, including its presence, position, size, shape, etc. This is done by solving the temporal correspondence problem, the problem of matching the target region in successive frames of a sequence of images taken at closely spaced time intervals. These two processes are closely related because tracking usually starts with detecting objects, while detecting an object repeatedly in subsequent image sequence is often necessary to help and verify tracking. Human object detection and tracking are important in many computer vision applications including activity recognition, automotive safety and surveillance. Object detection is an easy and simple task for humans, but not so for computers. It has been regarded as the most complex and challenging problem in the Field of computer vision due to large intra-class variations caused by the changes in physical appearance, lighting. Such variations result in the human object detection to be highly nonlinear and complex in any space that is linear to the original image space.

First a video is captured on the street and it is processed using an interface of GUI in MATLAB. Using the GUI this program can load any recorded video into the interface and detects the human objects and highlights them using the tracker. The tracked objects can be useful for the people travelling on the roads for road safety purpose. It can also be useful for the people away from the traffic area to recognize the traffic in that spot. It can run in Matlab or as a stand-alone application. Instead of using recorded video, if we use live video by attaching the camera to the car while moving, the pedestrians are highlighted and it helps the drivers for recognizing them in dim lights and for having an enhanced view of the street. Through this project we are aiming at improving the road safety by detecting and tracking the human objects by using digital image processing techniques.

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Fig 6: Figure showing Results of ACF

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Fig 9: Figure illustrating Output GUI

Fig 10: Figure showing Video loaded interface

Fig 11: Figure showing Output window screenshot case

Fig 12: Figure showing Output window screenshot

Fig 13: Figure showing Output window screenshot

LIST OF ABBREVIATIONS

ACF – Aggregate Channel Feature

ANN – Artificial Neural Network

EISPACK – Eigen System Package

EKF – Extended Kalman Filter

FORTRAN – Formula Translation

GPS – Global Positioning System

GUI – Graphical User Interface

GUIDE – Graphical User Interface Developing Environment

LINSPACK – Linear System Package

LQE – Linear Quadratic Estimation

MATLAB – Matrix Laboratory

ROI – Region of Interest

SVM – Support Vector Machines

UI – User Interface