DECLARATION BY THE CANDIDATE

JULY 2014

Date:_____

I here by declare that the work presented in this thesis entitled "**Tracking the Objects in Motion**" has been carried out by me under the guidance of **Mr. Rajesh Rohilla**, Associate Professor, Department of Electronics & Communication Engineering, Delhi Technological University, Delhi and hereby submitted for the partial fulfilment for the award of degree of Master of Technology in Signal Processing & Digital Design at Electronics & Communication Engineering Department, Delhi Technological University, Delhi.

I further undertake that the work embodied in this thesis has not been submitted for the award of any other degree elsewhere.

Varun Sangwan
2K12/SPD/22
M.Tech (SPDD)

CERTIFICATE

It is to certify that the above statement made by the candidate is true to the best of my knowledge and belief.

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ABSTRACT

Visual surveillance especially for humans, has recently been one of the most active research topics in machine vision because of its applications such as deter and response to crime, suspicious activities, terrorism or human behaviour recognition. In this dissertation, we have proposed a model which combines features and appearance so as to make the system robust for multiple object tracking. The system works on the principal of background subtraction for which the background is learned using Gaussian Mixture Model. The system uses Kalman filter for the prediction and tracking. So the system is able to predict the position of the object in case of full occlusion. To deal with partial occlusion, the system performs the matching of features. Color, edge, texture and FAST features are extracted and compared with previous frame during partial occlusion. Bhattacharyya distance is evaluated for the matching of color, edge and texture. Texture feature has been extracted using Gabor filter which uses multiple scales and orientations. The key points in the objects are extracted using FAST features. These key points are matched so as to make the system robust. Experimental results on several real videos sequences from different conditions have shown the effectiveness of our approach.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATION USED

MOT Multiple Object Tracking

MTT Multiple Target Tracking

GMM Gaussian Mixture Model

MoG Mixture of Gaussian

LoG Laplacian of Gaussian

DoG Differentiation of Gaussian

SIFT Scale Invariant Feature Transform

SURF Speed Up Robust Feature

FAST Features from Accelerated Segment Test

SUSAN Smallest Univalue Segment Assimilating Nucleus

USAN Univalue Segment Assimilating Nucleus

MS Mean Shift

PF Particle Filter