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Multi-target Tracking through Occlusions Using Extended Kalman Filter and Network Flows

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ABSTRACT: *Multi-target tracking under the condition of occlusions is one of the difficult and attractive field in video tracking. Multi-target tracking has been modelled as network flows (NF) optimization problem recently. It is one of the most popular tracking-by-detection (TBD) algorithm, which links individual detections into trajectories. NF method is particularly effective due to its simple model and optimal solutions. But it is difficult to track multi-target from consecutive frames under long-term occlusions. Therefore, an approach combining extended Kalman filter (EKF) and NF algorithm is proposed in this paper, in which EKF can predict the position of the occluded target. Experimental results show that the proposed tracking method based on EKF and NF (EKF -NF), can enhance the stability of tracking multiple moving targets in complex scenarios*

I. INTRODUCTION

Image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two dimensionalsignal and applying standard signal-processing techniques to it. Image processing usually refers to digital image processing, but optical and analog image processing also are possible.

Digital image processing is the use of computer algorithms to perform image processing on digital images. In a subcategory or field of digital signal processing, digital image processing has many advantages over analog image processing. It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing. Since images are defined over two dimensions digital image processing may be modelled in the form of multidimensional systems.

In particular, digital image processing is the only practical technology for Classification, Feature extraction, Pattern recognition, Projection, Multi-scale signal analysis. Some techniques which are used in digital image processing include Pixilation, Linear filtering, Principal components analysis, Independent component analysis, Hidden Markov models, anisotropic diffusion, Partial differential equations, Self-organizing maps, neural networks, and Wavelets.

Image processing basically includes the following three steps.

- Importing the image with optical scanner or by digital photography.
- Analysing and manipulating the image which includes data compression and image enhancement and spotting patterns that are not to human eyes like satellite photographs.
- Output is the last stage in which result can be altered image or report that is based on image analysis.

The purpose of image processing is divided into 5 groups.

- Visualization - Observe the objects that are not visible.
- Image sharpening and restoration - To create a better image.
- Image retrieval - Seek for the image of interest.
- Measurement of pattern – Measures various objects in an image.
- Image Recognition – Distinguish the objects in an image.

The two types of methods used for Image Processing

- AnalogImage processing
- Digital Image Processing.

Analog or visual techniques of image processing can be used for the hard copies like printouts and photographs. Image analysts use various fundamentals of interpretation while using these visual techniques. The

image processing is not just confined to area that has to be studied but on knowledge of analyst. Association is another important tool in image processing through visual techniques. So analysts apply a combination of personal knowledge and collateral data to image processing.

Digital Processing techniques help in manipulation of the digital images by using computers. As raw data from imaging sensors from satellite platform contains deficiencies. To get over such flaws and to get originality of information, it has to undergo various phases of processing. The three general phases that all types of data have to undergo while using digital technique are Pre- processing, enhancement-display and information extraction.

II. EXISTING SYSTEM

It presented an advanced moving object detection algorithm for automatic traffic monitoring in real word limited bandwidth networks. Traffic surveillance systems using video communication over real-world networks with limited bandwidth often encounter difficulties due to network congestion and/or unstable bandwidth. This has necessitated the development of a rate control scheme which alters the bit-rate to match the obtainable network bandwidth, thereby producing variable bit-rate video streams. However, complete and accurate detection of moving objects under variable bit-rate video streams is a very difficult task. Analysis-based radial basis function network as its principal component are proposed. This approach is applicable not only in high bit-rate video streams, but in low bit-rate video streams, as well. Quantitative and qualitative evaluations demonstrate that accuracy level is low and complexity is maximum.

PROPOSED & MODIFICATION SYSTEM

Feature selection, also known as variable selection, attribute selection or variablesubset selection, is the process of selecting a subset of relevant features for use in model construction. The central assumption when using a feature selection technique is that the data contains many redundant or irrelevant features. Redundant features are those which provide no more information than the currently selected features. Irrelevant features provide no useful information in any context. Feature selection techniques are a subset of the more general field of Feature extraction. Feature extraction creates new features from functions of the original features, whereas feature selection returns a subset of the features. Feature selection techniques are often used in domains where there are many features and comparatively few samples.

The benefits of Feature selection are

- Improved model interpretability
- Shorter training times
- Enhanced generalization by reducing over fitting.

Feature selection is also useful as part of the data analysis process, as it shows which features are important for prediction, and how these features are related.

III. SAMPLE OUTPUT

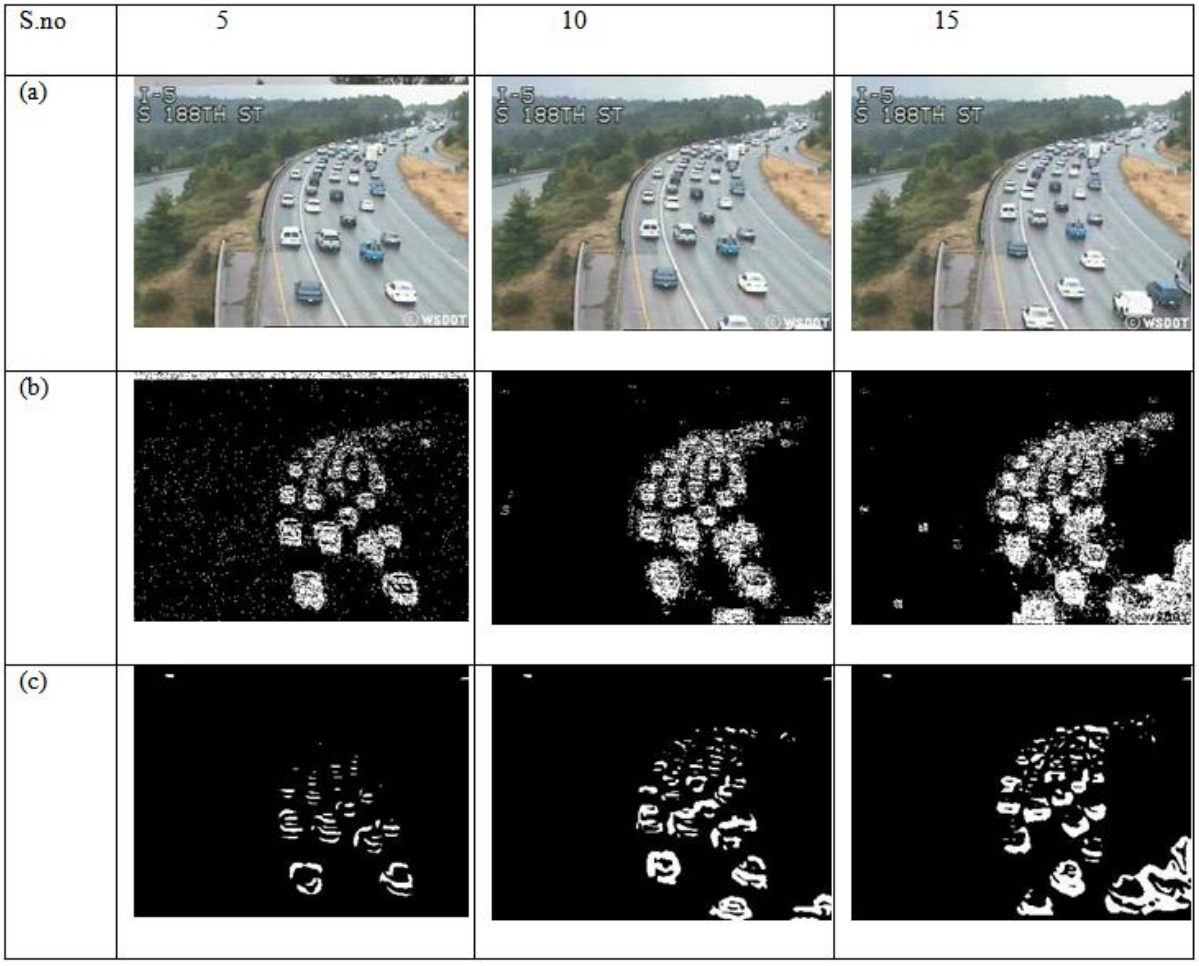

Figure3.1 Simulation Result of background subtraction

conversions are done in MATLAB 2011a version.

Figure3.2 Simulation result of vehicle tracking

IV. CONCLUSION

Video-surveillance and traffic analysis systems can be heavily improved using vision-based techniques able to extract, manage and track objects in the scene. The given RGB videos are converted into frames. Then by applying PCA based HOG features are selected. Here the whole frame is considered as a single block for features extraction process without changing the performance. Through simulation accuracy rates produced by proposed approach is same as macro block based approach with considerable complexity reduction but time duration were up to 90% higher than those produced via other methods, respectively.

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