FRAME-LEVEL MATCHING OF NEAR DUPLICATE VIDEOS BASED ON TERNARY FRAME DESCRIPTOR AND ITERATIVE REFINEMENT

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ABSTRACT

A frame-level video matching algorithm, which achieves dense frame matching between near-duplicate videos, is proposed in this work. First, we propose a ternary frame descriptor for the near duplicate video matching. The ternary descriptor partitions a frame into patches and uses ternary digits to represent relations between pairs of patches. Second, we formulate the frame-level matching problem as the minimization of a cost function, which consists of matching costs and adaptive un-matching costs. We develop an iterative refinement scheme that converges to a local minimum of the cost function. The iterative scheme performs competitively with the global optimization techniques while demands a significantly lower computational complexity. Experimental results show that the proposed algorithm achieves effective frame description and efficient frame matching of near duplicate videos.

Keyword : - *Near-duplicate video detection, frame-level video matching, ternary frame descriptor, and iterative refinement.*

1. INTRODUCTION

Emerging online video-related services such as video sharing, video broadcasting, video recommendation and so on, increasingly bring user interests and participation to video related activities like editing, publishing, searching, streaming, and viewing. According to a report by comScore.com, a leading company in measuring the digital world, 76.8% of the total U.S. Internet audience viewed online videos and these users viewed 14.8 billion online videos in January 2009 alone, with an average view count of 101 videos and an average view time of 356 minutes per user. It also shows an evident rising demand for online videos, supported by the facts that the view count of January 2009 increased by 4% and average view time up by 15% compared to November 2008.Enlightened

by the observation that corresponding key frames of two near-duplicate videos usually exhibit regular alignment patterns, the alignment distortion is proposed to measure the temporal arrangement of the key frames. The idea of distortion was previously used in the shape matching problem. In this paper, we present a novel frame descriptor for efficient near-duplicate video matching, called the ternary frame descriptor. As a patch-based descriptor, the proposed descriptor represents the order relations of patch intensities in ternary digits. To compute the similarity of the ternary descriptors of two frames in a fast manner, we transform the ternary digits into bits and employ the Hamming distance. Moreover, we propose a frame-level matching algorithm to obtain dense frame matching between near-duplicate videos. We first formulate a cost function for the matching, which consists of matching costs and adaptive un-matching costs. Then, we develop an iterative refinement scheme, which is guaranteed to converge to a local minimum of the cost function. Experimental results confirm that the proposed algorithm achieves effective frame description and efficient frame matching of near-duplicate videos.

1.1 Motivation

With the popularization of video-sharing sites, such as YouTube and Video , an enormous amount of videos are available on the Internet. A typical video database contains near-duplicate videos, which have the same contents but different modifications, *e.g.* subtitle insertion, contrast enhancement, and cropping. Near-duplicate videos induce redundancy and inefficiency in video retrieval and database management.

1.2 Objectives

1. To develop a ternary frame descriptor for near-duplicate video matching.
2. To reduce the cost function monotonically.
3. To lower computational complexity.

2. FLOW OF SYSTEM

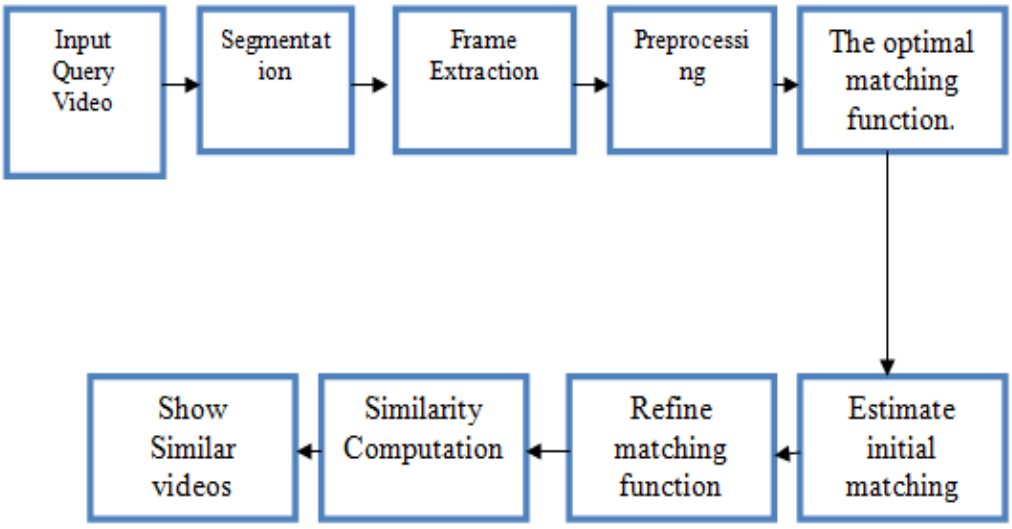

Fig :- System Flow

We present a novel frame descriptor for efficient near-duplicate video matching, called the ternary frame descriptor. As a patch-based descriptor, the proposed descriptor represents the order relations of patch intensities in ternary digits. To compute the similarity of the ternary descriptors of two frames in a fast manner, we transform the ternary digits into bits and employ the Hamming distance. we propose a frame-level matching algorithm to obtain dense frame matching between near-duplicate videos. We first formulate a cost function for the matching, which consists of matching costs and adaptive un-matching costs. Then, we develop an iterative refinement scheme, which is guaranteed to converge to a local minimum of the cost function.

3. RESULTS

1. Log In Window

Fig 1:- Login Window

2.TrainSet

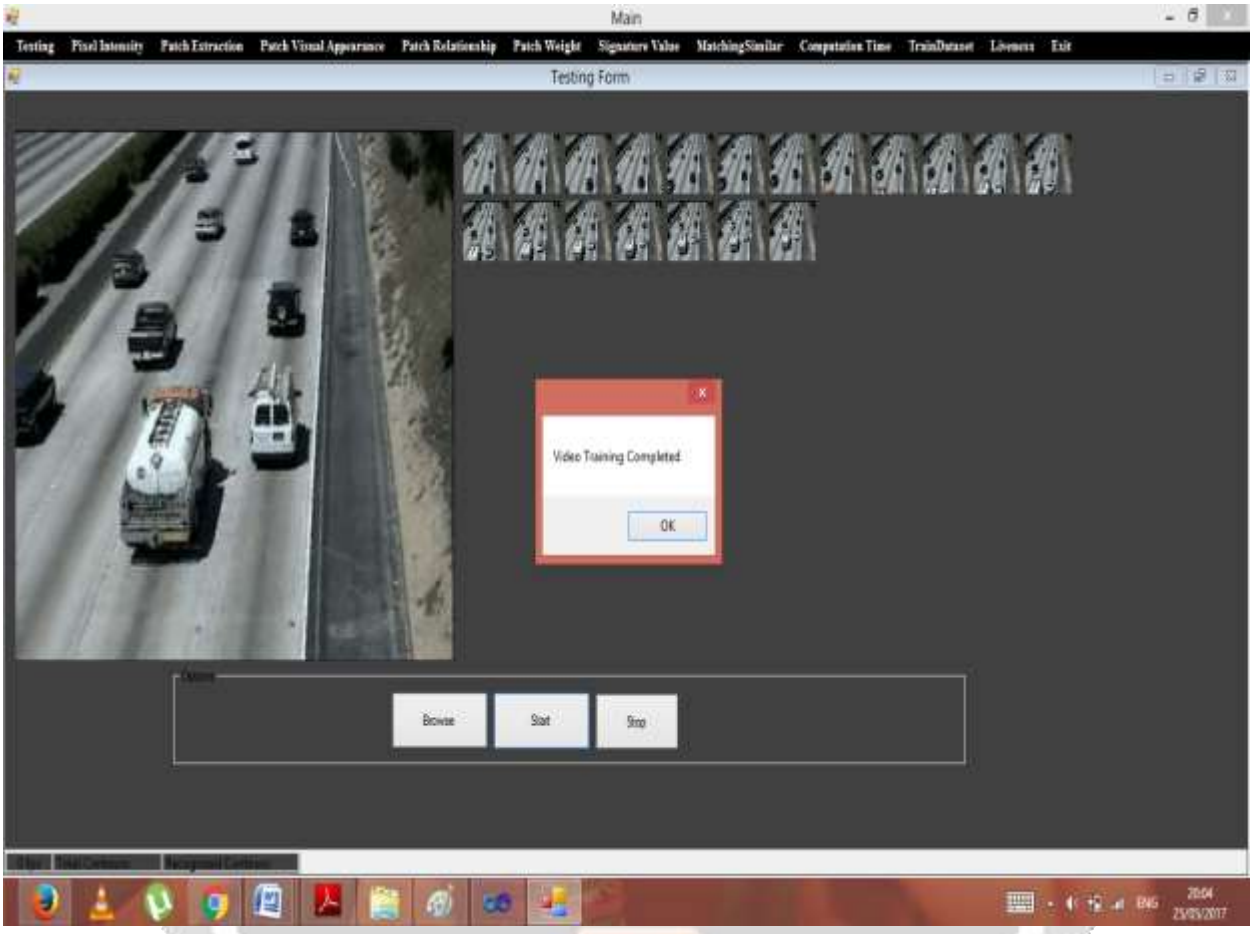

Fig 2 -: Train Data Set

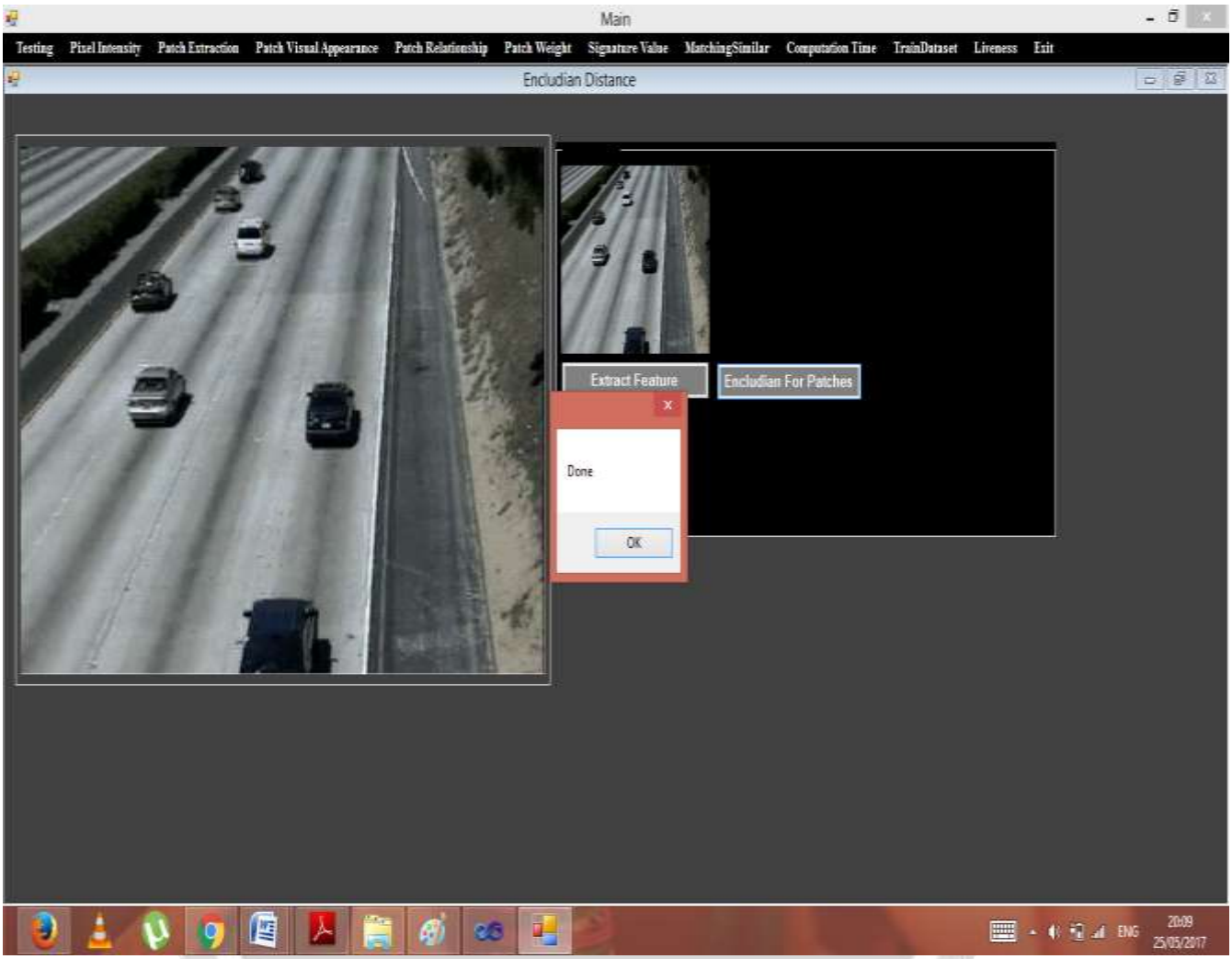

Fig 3 :- Feature Extraction

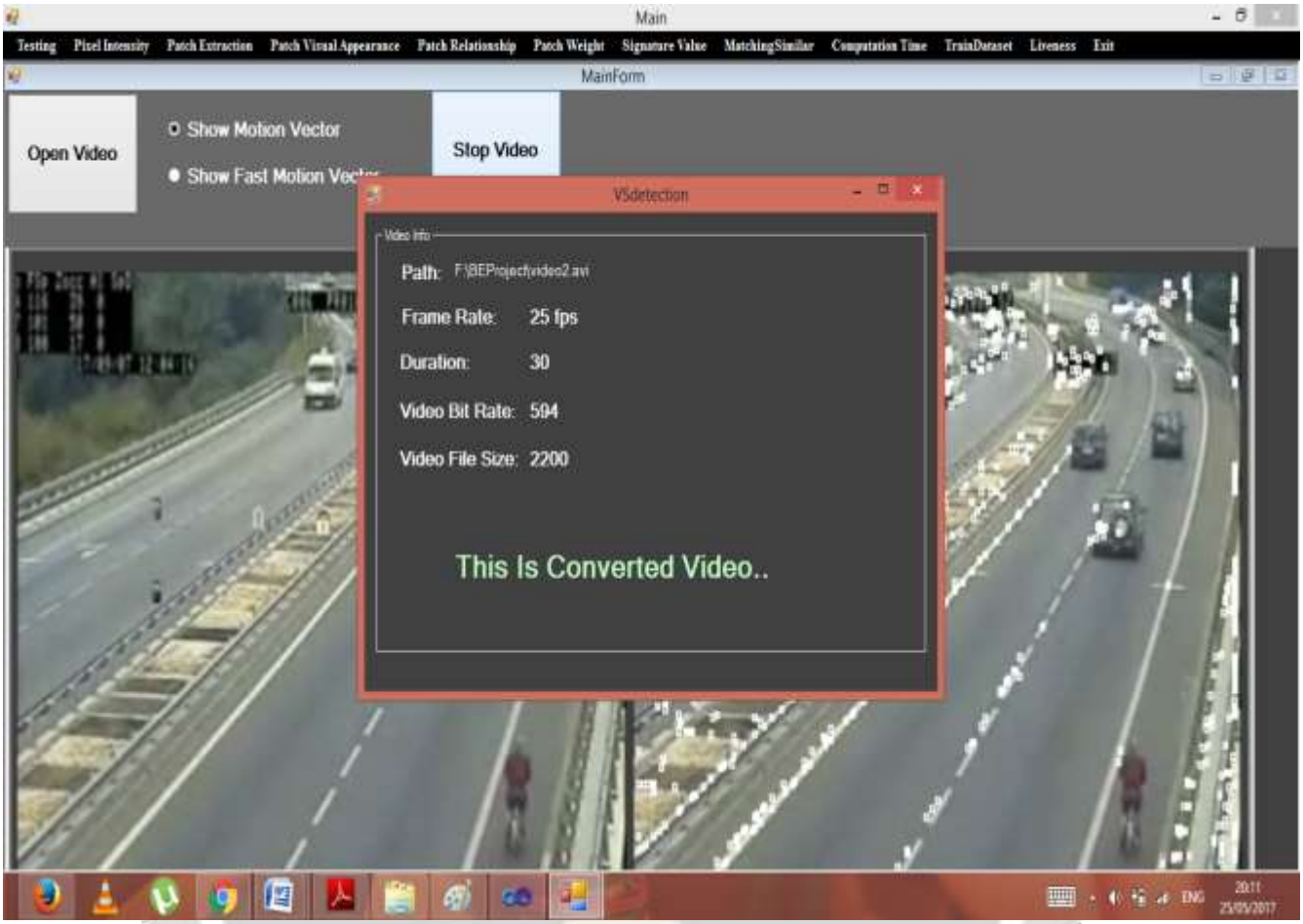

Fig 4 :- Liveness

4. CONCLUSIONS

We proposed the ternary frame descriptor for near-duplicate video matching. Specifically, we partitioned a frame into patches and described the order relations of patch intensities with ternary digits, which were converted into bits for fast similarity measurement using the Hamming distance. Moreover, we developed an efficient and precise frame-level matching algorithm. We first formulated a cost function for the matching, composed of matching costs and adaptive un-matching costs. Then, we roughly determined initial matching and refined those matching iteratively to reduce the cost function monotonically. Experimental results demonstrated that the proposed ternary descriptor performs better than the conventional descriptors and that the proposed matching algorithm achieves competitive performance with the global optimization technique, while demanding a significantly lower computational complexity.

5. ACKNOWLEDGEMENT

It gives us great pleasure in presenting the preliminary project report on 'Frame- Level Matching Of Near Duplicate Videos Based On Ternary Frame Descriptor And Iterative Refinement'. I would like to take this opportunity to thank my internal guide Prof. J.V.SHINDE for giving me all the help and guidance I needed. I am really grateful to them for their kind support. Their valuable suggestions were very helpful. I am also grateful to Prof. N.R.WANKHADE, Head of Computer Engineering Department, Late G. N. Sapkal college of Engineering for his indispensable support, suggestions. In the end our special thanks to principal Dr. N. R. Bagal for providing various resources such as laboratory with all needed software platforms, continuous Internet connection, for Our Project.

6. REFERENCES

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