Hybrid Approach of Nu-Mob, Mobil and MOBILAP for Face Recognition System

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Abstract:-This is the first attempt to systematically address face recognition under (i) non-uniform motion blur and (ii) the combined effects of blur, illumination and pose. In this paper, we propose a methodology for face recognition in the presence of space-varying motion blur comprising of kernels. We model the blurred face as a convex combination of geometrically transformed instances of the focused gallery face, and show that the set of all images obtained by non-uniformly blurring a given image forms a convex set. We first propose a non-uniform blur-robust algorithm by blurring the gallery image's with its corresponding TSF function and extract LBP features and finally returns the identity of the probe image by comparing the LBP features of the probe image with those of the transformed gallery images and find the closest match. Then we propose the motion blur and illumination-robust algorithm by blurring and re-illuminating the gallery image's with its corresponding optimal TSF function and illumination coefficients and extract LBP features and finally returns the identity of the probe image. Finally we propose the motion, blur, illumination and pose-robust algorithm by estimating and synthesizing the new pose of the blurred probe image and then blurring and re-illuminating the gallery image's with its corresponding optimal TSF function and illumination coefficients and extract LBP features and finally finds the closest match of the given input probe image.

Keywords:- *Face Recognition, TSF, NU-MOB, LBP*

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I. INTRODUCTION

It is well-known that the accuracy of face recognition systems deteriorates quite rapidly in unconstrained settings. This can be attributed to degradations arising from blur, changes in illumination, pose, and expression, partial occlusions etc. Motion blur, in particular, deserves special attention owing to the ubiquity of mobile phones and hand-held imaging devices. Dealing with camera shake is a very relevant problem because, while tripods hinder mobility, reducing the exposure time affects image quality. Moreover, in-built sensors such as gyros and accelerometers have their own limitations in sensing the camera motion. In an uncontrolled environment, illumination and pose could also vary, further compounding the problem.

The focus of this paper is on developing a system that can recognize faces across non-uniform (i.e., space-variant) blur, and varying illumination and pose. Traditionally, blurring due to camera shake has been modeled as a convolution with a single blur kernel, and the blur is assumed to be uniform across the image. However, it is space-variant blur that is encountered frequently in hand-held cameras. While techniques have been proposed that address the restoration of non-uniform blur by local space-invariance approximation, recent methods for image restoration have modeled the motion-blurred image as an average of projectively transformed images.

Face recognition systems that work with focused images have difficulty when presented with blurred data. Approaches to face recognition from blurred images can be broadly classified into four categories. Deblurring-based in which the probe image is first deblurred and then used for recognition. However, deblurring artifacts are a major source of error especially for moderate to heavy blurs. Joint deblurring and recognition, the flip-side of which is computational complexity.

Deriving blur-invariant features for recognition. But these are effective only for mild blurs. The direct recognition approach of and in which reblurred versions from the gallery are compared with the blurred probe image. It is important to note that all of the above approaches assume a simplistic space-invariant blur model. For handling illumination, there have mainly been two directions of pursuit based on the 9D subspace model for face and extracting and matching illumination insensitive facial features combine the strengths of the above two methods and propose an integrated framework that includes an initial illumination normalization step for face recognition under difficult lighting conditions. A subspace learning approach using image gradient orientations for illumination and occlusion-robust face recognition has been proposed. Practical face recognition algorithms must also possess the ability to recognize faces across reasonable variations in pose. Methods for face recognition across pose can broadly be classified into 2D and 3D techniques. A good survey article on this issue can be found Although the problem of blur, illumination and pose are individually quite challenging and merit research in their own right, a few attempts have been made in the literature.

II. EXISTING SYSTEM

Existing methods for performing face recognition in the presence of blur are based on the convolution model and cannot handle non-uniform blurring situations that frequently arise from tilts and rotations in hand-held cameras. The convolution model is sufficient for describing blur due to in-plane camera translations, a major limitation is that it cannot describe several other blurring effects (including out-of-plane motion and in-plane rotation) arising from general camera motion. In order to demonstrate the weakness of the convolution model in handling images blurred due to camera shake, we synthetically blur the focused gallery image to generate a probe, and provide both the gallery image and the blurred probe image as input to two algorithms- the convolution model which assumes space invariant blur, and the non-uniform motion blur model which represents the space-variant blurred image as a weighted average of geometrically warped instances of the gallery.

III. PROPOSED SYSTEM

In this paper, we propose a methodology for face recognition in the presence of space-varying motion blur comprising of kernels. We model the blurred face as a convex combination of geometrically transformed instances of the focused gallery face, and show that the set of all images obtained by non-uniformly blurring a given image forms a convex set. We first propose a non-uniform blur-robust algorithm by blurring the gallery image's with its corresponding TSF function and extract LBP features and finally returns the identity of the probe image by comparing the LBP features of the probe image with those of the transformed gallery images and find the closest match. Then we propose the motion blur and illumination-robust algorithm by blurring and re-illuminating the gallery image's with its corresponding optimal TSF function and illumination coefficients and extract LBP features and finally returns the identity of the probe image. Finally we propose the motion, blur, illumination and pose-robust algorithm by estimating and synthesizing the new pose of the blurred probe image and then blurring and re-illuminating the gallery image's with its corresponding optimal TSF function and illumination coefficients and extract LBP features and finally finds the closest match of the given input probe image.

IV. PROPOSED TECHNIQUES

- Transformation Spread Function (TSF)
- Illumination coefficients
- Local Binary Pattern (LBP)

V. PROPOSED ALGORITHM

- NU-MOB: Non-Uniform Motion Blur-Robust Face Recognition
- MOBIL: Motion Blur and Illumination-Robust Face Recognition
- MOBILAP: Motion Blur, Illumination and Pose-Robust Face Recognition

VI. PROPOSED ADVANTAGES

- This is the first attempt to systematically address face recognition under (i) non-uniform motion blur and (ii) the combined effects of blur, illumination and pose.
- They can handle non-uniform blurring situations
- They can detect the face regions. Therefore, they can achieve satisfactory detection results
- Face regions are detected and extracted correctly.
- The relevant face images present in the gallery/database were retrieved properly.

VII. FUTURE ENHANCEMENT

Due to the presence of large amount of face images there is a direct need for an efficient face recognition approach that can automatically retrieve the preferred face image from the database. However, most of the conventional approaches lack the capability to meet the human intuition for retrieving images. Principal Component Analysis based method is developed in order to obtain satisfactory results for images.

VIII. EXPERIMENTAL RESULT

Though their will be many images in the data base gallery the required image is matched finally without any ambiguity.

Fig: Blurred and Illuminated Image

IX. CONCLUSION

In this study, we propose the motion, blur, illumination and pose-robust algorithm by estimating and synthesizing the new pose of the blurred probe image and then blurring and re-illuminating the gallery image's with its corresponding optimal TSF function and illumination coefficients and extract LBP features and finally finds the closest match of the given input probe image.

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