# FACIAL IDENTIFICATION WITH OCCLUSION USING ROBUST AND LOW-RANK REPRESENTATION

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**ABSTRACT:**

face identification (FI) target only on reduced the image identify is one of the main problem in computer vision . At FI database contained by non occluded faces with some intra-class illumination, and test sample contains a 80% random part (block) of occlusion of the illuminating features in a face are covered. Some of the proposed countermeasures have achieved impressive results when evaluated on intra-tests i.e. the system is trained and tested on the same database. Unfortunately, most of these techniques fail to generalize well to unseen attacks

e.g. when the system is trained on one database and then evaluated on another database. This is a major concern in biometric anti-spoofing research which is mostly overlooked. In this Concept a novel solution based on describing the facial appearance by applying Fisher Vector

encoding on Speeded-Up Robust Features(SURF) extracted from different color spaces is proposed for anti- spoofing system design

## INTRODUCTION

Robust representation method exhibited high computational cost and also identification results reduced the block occlusion up to 50%. To solve the robust representation problem to propose a iterative method, iterative method reduces the robust representation problem when block occlusion are 70% and reduces the computational cost this method effectively work on robust representation problems with occlusions of 70%, and also eliminated the contiguous errors. Robust representation method perform the FI based on two characteristics. The first characteristic is tailored loss function and second characteristic is reduced the rank structure of a image (low-rank representation) , this two characteristics reducing the spatial continuity errors effectively. As an example, Fig. 1 illustrates a social image and its associated user-provided tags. These valuable metadata can greatly facilitate the

organization and search of the social media. By indexing the images with associated tags, images can be easily retrieved for a given query. However, since user- provided tags are usually noisy and incomplete, simply applying text-based retrieval approach may lead to unsatisfactory results. Therefore, a ranking approach that is able to explore both the tags and images' content is desired to provide users better social image search results. Currently, Flickr provides two ranking options for tag-based image search.

One is ―most recent‖, which orders images based on their uploading time, and the other is ―most interesting‖, which ranks the images by ―interestingness‖, a measure that integrates the information of click-through, comments, etc. In the following discussion, we name these two methods time-based ranking and interestingness-based ranking, respectively. They both rank images according to measures (interestingness or time) that are not related to relevance and it results in many irrelevant images in the top search results. As an example, Figure illustrates the top results of query ―waterfall‖ with the two ranking options, in which we can see that many images are irrelevant to the query, such as those marked with red boxes. In addition to relevance, lack of diversity is also a problem. Many images from social media websites are actually close to each other. For example, several users get used to upload continuously captured images in batch, and many of them are visually and semantically close. When these images appear simultaneously as top results, users will get only limited information. we can also observe this fact, the images marked with blue or green boxes are very close to at least one of the other images. Therefore, a ranking schemethat can generate relevant and diverse results is highly desired. This problem is closely related to a key scientific challenge that is recently released by Yahoo research: ―how do we combine both content-based retrieval with tags to do something better than either approach alone for multimedia retrieval‖. The importance of relevance is clear. In fact, this is usually regarded as the bedrock of information retrieval: if an IR system's response to each query is a ranking of documents in order of decreasing probability of relevance, the overall effectiveness of the system to its user will be maximized The time-based and interestingness-based ranking options are of course useful. For example, users can easily browse the images that are recently uploaded via the time-based ranking. But when users perform search with the intention of finding specific images, relevance will be more important than timeand interestingness.

## PROPOSEDSYSTEM

### Existing system Drawbacks

**lack of generalization**—current approaches are spoof material- and/or trait- dependent, such that feature descriptors proposed for face spoofing may not function effectively if employed for iris or fingerprint spoofing and vice versa.

Likewise, the performance of face livenessdetectors drastically drops when they are presented with novel fabrication

materials (not used during the system design/training stage); **high error rates**— none of the methods still have shown to reach a very low acceptable error rates.

The good performance of SIFT compared to other descriptors [8] is remarkable. Its mixing of crudely localised information and the distribution of gradient related features seems to yield good distinctive power while fending off the effects of localisation errors in terms of scale or space. Using relative strengths and orientations of gradients reduces the effectof photometric changes.

### ADVANTAGES:

Face anti-spoofing detection method based on depth information has obvious advantages: the depth information has the characteristics of illumination invariance, so the robustness of the face anti-spoofing detection is good. Prevent static and dynamic 2D spoofs. Active and passive liveness checks

## LITERATURE SURVEY

Many Internet scale image search methods are text-based and are limited by the fact that query keywords cannot describe image content accurately. Content-based image retrieval uses visual features to evaluate image similarity. Many visual features were developed for image search in recent years. Some were global features such as GIST and HOG . Some quantized local features, such as SIFT , into visual words, and represented images as bags-of- visual- words (BoV) . In order to preserve the geometry of visual words, spatial information was encoded into the BoV model in multiple ways. For example, Zhang et al. proposed geometry- preserving visual phases which captured the local and long-range spatial layouts of visual words. One of the major challenges of content-based image retrieval is to learn the visual similarities which well reflect the semantic relevance of images. Image similarities can be learned from a large training set where the relevance of pairs of images is known . Deng et al. learned visual similarities from a hierarchical structure defined on semantic attributes of training images. Since web images are highly diversified, defining a set of attributes with hierarchical relationships for them is challenging. In general, learning a universal visual similarity metric for generic images is still an open problem to be solved. Some visual features may be more effective for certain query images than others. In order to make the visual similarity metrics more specific to the query, relevance feedback was widely used to expand visual examples. The user was asked to select multiple relevant and irrelevant image examples from the image pool. A query- specific similarity metric was learned from the selected examples.

For example, in discriminative models were learned from the examples labeled by users using support vector machines or boosting, and classified the relevant and irrelevant images. In the weights of combining different types of features were adjusted according to users‘ feedback.

Since the number of user-labeled images issmall for supervised learning methods, Huang et al.proposed probabilistic hypergraph ranking under the semi-supervised learning framework. It utilized both labeled and un- labeled images in the learning procedure.Relevance feedback required more users‘ effort. For a web-scale commercial system users‘ feedback has to be limited to the minimum, such as one-click feedback. In order to reduce users‘ burden, pseudo relevance feedback expanded the query image by taking the

top *N* images visually most similar to thequery image as positive examples. However, due to the well- known semanticgap, the top *N* images may not be all semanticallyconsistent with the query image.

## RELATED WORK

- **Iris Spoofing**

Daugman [28, Section 8 – Countermeasures against

Subterfuge]1 was one of the first authors to discuss the feas of some attacks on iris recognition systems.The author proposed the use of Fast Fourier Transform to verify the high frequency spectral magnitude in the frequency domain. The solutions for iris liveness detection available in the literature range from active solutions relying on special acquisition hardware to software-based solutions relying on texture analysis of the effects of anattacker using color contact lenses with someone else's pattern printedonto them. Software-based solutions have also explored the effects of cosmetic contact lenses pupil constriction; and multi biometrics of electroencephalogram (EEG) and iris together , among others.

Galbally et al. [38] investigated 22 image quality measures (e.g., focus,motion, occlusion, and pupil dilation). The best features are selected through sequential floating feature selection (SFFS) to feed a quadratic discriminant classifier

- **Face Spoofing**

We can categorize the face anti-spoofing methods into four groups [50]: user behavior modeling, methods relying on extra devices [51], methods relying on user cooperation and, finally, data- driven characterization methods. Inthis section, we review data-driven characterization methods proposed in literature, the focus of our work herein. Ma¨att ¨ a et al. [52] used LBP operator for capturing printing ¨ artifacts and micro- texture patterns added in the fake biometric samples during acquisition. Fingerprint Spoofing We can categorize fingerprint spoofing detection methods roughly into two groups: hardware- based (exploring extra sensors) and software-based solutions (relying only on the information acquired by the standard acquisition sensor of the authentication system) .

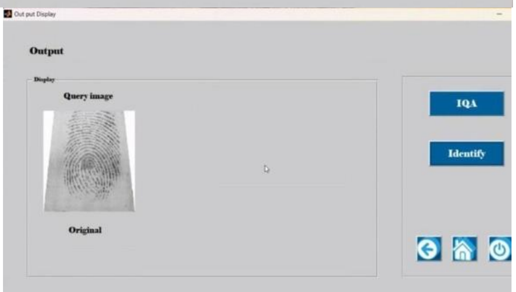
Galbally et al. proposed a set of feature for fingerprint liveness detection based on quality measures such as ridge strength or directionality, ridge continuity, ridge clarity, and integrity of the ridge-valley structure. The validation considered the three benchmarks used in LivDet

2009 – Fingerprint competition captured with different optical sensors: Biometrika, CrossMatch, and Identix.

- **Multi-modalities**

Recently, Galbally et al.proposed a general approach based on 25 image quality features to detect spoofing attempts in face, iris, and fingerprint biometric systems. Our work is similar to theirs in goals, but radically different with respect to the methods. Instead of relying on prescribed image quality features, we build features thatwould be hardly thought by a human expert with AO and FO. Moreover, here we evaluate our systems in more recent and updated benchmarks.

## SAMPLE RESULTS


## CONCLUSION

We proposed a face anti-spoofing scheme based on color SURF (CSURF) features and Fisher Vector encoding. We extracted the SURF features from two different color spaces (HSV and YCbCr). Then, we applied PCA and Fisher Vector encoding on the concatenated features. The proposed approach based on fusing the features extracted from the HSV and YCbCr was able to perform very well on three most challenging face spoofing datasets, outperforming state of the art results.

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