# A Review Paper of Integrated Face and Pose Identification with Facial Sketch through SIFT Matching Algorithm

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***Abstract- This paper offers a feature-based totally method for matching facial cartoon pictures to stand images. Earlier methods calculated descriptors over the entire photo and used some transformation and matched them by means of a few classifiers. We gift associate plan, in which descriptors ar calculated at selected distinct factors (eyes, nostril, ears…). This lets in United States to healthy completely distinguished options. We use SIFT (Scale Invariant feature rework) to extract feature descriptors at the annotated points inside the sketches and experiment with numerous ways to retrieve pix. Experimental outcomes exhibit considerable matching performances exploitation the bestowed function-based approaches at a low machine price.***

***Keywords viola Jones algorithm, Sift algorithm, Pca, Knn.***

## I INTRODUCTION

Heng Yang, Changqing Zou, and Ioannis Patras[36] in this paper present Accurate face land marking and facial feature detection square measure vital operations that have a sway on succeeding tasks centered on the face, like committal to writing, face recognition, expression and/or gesture understanding, gaze detection, animation, face pursuit etc. we tend to outline a face landmark as a distinguished feature will which will that may} play a discriminative role or can function anchor points on a face graph. ordinarily used landmarks square measure the attention corners, the nose tip, the naris corners, the mouth corners, the top points of the super cilium arcs, ear lobes, national, chin etc. we tend to like victimization the term facial part as denoting a whole facial linguistics region, like the full region of a watch or of eyes, the region of the nose, mouth, chin, cheek, or eyebrows. Landmarks like eye corners or nose tip square measure legendary to be very little stricken by facial expressions, therefore {they square measure they're} additional reliable and are in reality brought up as fiducial points. Fiducially points in imaging systems talk over with marks deliberately placed within the scene to operate as some extent of reference or alive. By extension, comparatively stable or strong facial landmarks like eye corners or nose tip also are referred to as fiducially points or fiducial landmarks within the face process literature.

Face sketches are oft used as a way of visual Representation of an individual's face. Such illustration has been applied for digital diversion like cartoon synthesis, face expression recognition, face retrieval and face recognition in enforcement. In the latter case, the pica of a suspect isn't offered and therefore the face sketch is drawn supported the knowledge collected from the witnesses. Taking the sketch retrieval and photo-to-sketch face recognition as an example, the challenge of victimization sketch illustration mainly lies within the modality distinction between the sketch and therefore the pic. Many approaches target bridging the gap of the 2 modalities. Similar to photo-to-photo face recognition, it's crucial to align the face sketch 1st into a canonical create, wherever the face create is often represented by a collection of facial landmarks.

In this paper we tend to address the matter of cause independent face recognition with a gallery set containing one frontal face image per listed subject whereas the probe set is composed by simply a face image undergoing cause variations. The approach uses a group of aligned 3D models to be told deformation components employing a 3DMorphable Model (3DMM). This additional allows fitting a 3DMM with efficiency on a picture employing a Ridge regression answer, regular on the face area calculable via PCA. Then the approach describes every profile face by computing native Binary Pattern (LBP) histograms localized on each distorted vertex, projected on a rendered frontal read. In the experimental result we tend to judge the planned methodology on the CMU Multi-PIE to assess face recognition rule across cause. We show however our method results in higher performance than regular baselines news high recognition rate considering a spread of facial poses within the probe set, up to ±45◦. Finally we tend to remark that our approach will handle continuous cause variations and it's Comparable with recent progressive approaches [28].

Fig.1 An example image of face sketch synthesis. From left to right are the original RGB image, edge detection and our synthesized sketch image. In the synthesized image the eye regions and mouth region are enhanced and fused with the edge detection [36]

## II LANDMARK DEPENDENT TASKS

Expression understanding: Facial expressions type a visible channel for emotions and nonverbal messages, and that they have a job in supporting the language [14]. The spatial configuration and temporal dynamics of landmarks offer viable thanks to analyze facial expressions and to objectively describe head gestures and facial expressions. Automatic identification of action units inside the framework of the facial action writing (FACS) [15] advantages from detected landmarks and their position. a number of the approaches that use landmarks for recognizing Action Units square measure [1, 2] and for deciphering head gestures and facial expressions square measure [16,17].

•Face recognition: Face recognition schemes generally find the attention region then extract holistic options from the windows focused on numerous regions of interest [18, 19]. The situated landmark coordinates additionally create to variety of geometric properties like distances and angles between them [20]. In fact, measurement face models, wherever generally the face graph nodes correspond to landmark points, mix each sources of data, the design and look sources. The graph-based strategies have proved to be quite effective in several applications. One seminal add this space is that the elastic bunch graph matching technique (EBGM) [9].

Face following: Most face tracking algorithms have the benefit of half-track landmark sequences. within the model-based cluster of ways [11, 21], a face graph model is fitted to 60-80 facial landmarks. Face following is complete then by property the model graph to evolve in step with face form parameters, facial elements and geometrical relations between them. the choice following approach is model-free [12, 22,23] and is primarily supported motion.

## III LITERATURE REVIEW

A. William Robson Schwartz, , HuiminGuo, , Jonghyun Choi, and Larry S. Davis, in this paper present Identification Using Large Feature Sets With the intention of matching unknown faces in opposition to a gallery of regarded human beings, the face identity undertaking has been studied for several many years. There are very accurate strategies to perform face identification in managed environments, mainly when large numbers of samples are available for every face. but, face identity underneath out of control environments or with a lack of education facts remains an unsolved trouble. We rent a large and wealthy set of function descriptors (with greater than 70 000 descriptors) for face identification the usage of partial least squares to carry out multichannel characteristic weighting. Then, we amplify the technique to a tree-based discriminative shape to lessen the time required to assess probe samples. The technique is evaluated on Facial recognition generation (FERET) and Face popularity Grand mission (FRGC) data units. Experiments display that our identity method outperforms contemporary modern-day consequences, mainly for figuring out faces obtained throughout various conditions [7].

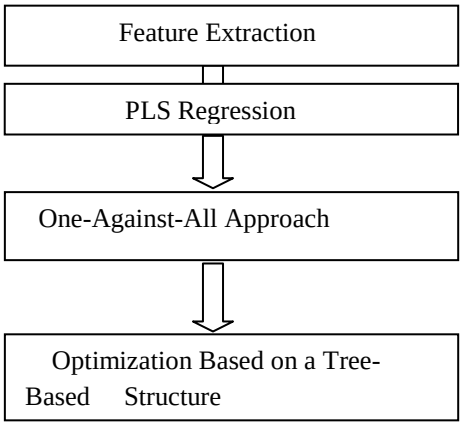


Fig.2 Face identification Using Large Feature Sets method [7].

B. Qi Zhu 1, Daoqiang Zhang 1, Han Sun 1, Zhengming Li 2 , in this paper present Feature-point tracking by optical flow discriminates subtle differences in facial expression for the first time proposes to mix traditional sparse representation (i.e. the L1-norm based sparse representation) and a singular L2-normbased totally representation for face popularity. The proposed technique is able to exert the benefits of those two distinctive sparse illustration strategies. The underlying motives why the proposed method can carry out thoroughly are as follows. First, the L2-norm is capable of avoid outliers and the L1-

norm is helpful for reaching the sparseness, that are both beneficial to accurate category. 2nd, the devised novel L2-norm primarily based representation itself is capable of acquire first-class overall performance. third, the rankings generated from these methods have low correlation and may provide complementary facts for recognizing the face. [12]

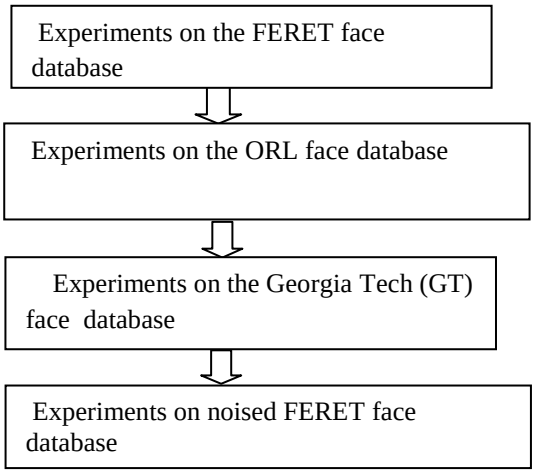


Fig. 3 Combining L1-norm and L2-norm based sparse representations for face recognition Experiments [12]

C. Heng Yang , Renqiao Zhang and Peter Robinson, in this paper present Human and Sheep Facial Landmarks Localization by Triplet Interpolated Features on this paper we present a way for localization of facial landmarks on human and sheep. We introduce a new feature extraction scheme referred to as triplet-interpolated characteristic used at every new release of the cascaded shape regression framework. it can extract capabilities from similar semantic area given an predicted form, even when head pose variations are big and the facial landmarks are very in moderation dispensed. moreover, we study the impact of training statistics imbalance on model overall performance and advise a education sample augmentation scheme that produces extra initializations for education samples from the minority. More mainly, the augmentation variety for a schooling sample is made to be negatively correlated to the price of the fitted probability density function at the pattern's position. We evaluate the proposed scheme on each human and sheep facial landmarks localization. at the benchmark 300w human face dataset, we show the advantages of our proposed techniques and display very competitive performance while evaluating to other techniques. On a newly created sheep face dataset, we get excellent overall performance no matter the fact that we best have a constrained variety of education samples and a set of sparse landmarks are annotated.[3]

D. Xiaowei Zhao, Shiguang Shan, Xiujuan Chai, Xilin Chen, in this paper present , Cascaded Shape Space Pruning for Robust Facial Landmark Detection unique cascaded face form space pruning algorithm for robust facial landmark detection. Through regularly with the exception of the incorrect candidate shapes, our set of rules can accurately and efficiently reap the globally greatest form configuration. Specially, person landmark detectors are first off applied to get rid of incorrect candidates for every landmark. Then, the candidate form space is similarly pruned by means of jointly getting rid of incorrect shape configurations. To obtain this cause, a discriminative shape classifier is designed to assess the candidate shape configurations. Primarily based at the found out Discriminative structure classifier, an efficient shape space pruning strategy is proposed to speedy reject maximum wrong candidate shapes while maintain the proper form. The proposed set of rules is cautiously evaluated on a massive set of actual international face pics. Further, comparison effects on the Publicly to be had Bio ID and LFW face databases demonstrate that our set of rules outperforms a few today's algorithms.[4]

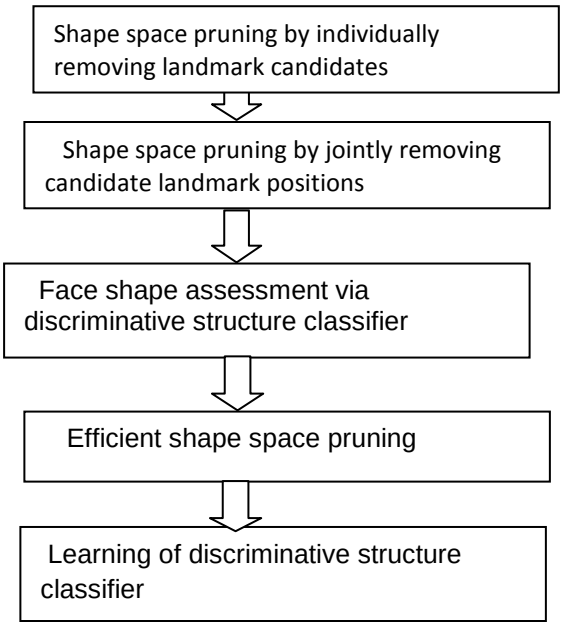


Fig.4 Facial landmark detection by cascaded shape space pruning method [4]

E. Heng Yang and Ioannis Patras, in this paper present Regression Forest Votes for Facial Feature Detection in the Wild recommend a way for the localization of multiple facial capabilities on challenging face pics. in the regression forests (RF) framework, observations (patches) which can be extracted at numerous image places cast votes for the localization of several facial features. so as to filter out out votes that are not relevant, we skip them through two styles of sieves, which can be organized in a cascade, and which enforce geometric constraints. the primary sieve filters out votes that aren't consistent with a hypothesis for the vicinity of the face middle. Several sieves of the second kind, one associated with every man

or woman facial point, filter out distant votes. We advocate a technique that adjusts on the- fly the proximity threshold of every 2d type sieve by way of applying a classifier which, based on center-stage capabilities extracted from vote casting maps for the facial function in query, makes a series of decisions on whether or not the brink should be decreased or not. We validate our proposed technique on two difficult datasets with snap shots collected from the net in which we achieve country of the artwork results without resorting to express facial shape models. We also show the blessings of our approach for proximity threshold adjustment specifically on 'difficult' face pix.[26]

F. Feng Zhou, Jonathan Brandt, Zhe Lin , in this paper present a Exemplar-based Graph Matching for Robust Facial Landmark Localization, Localizing facial landmarks is a essential step in facial picture analysis. However, the hassle is still challenging due to the large variability in pose and appearance, and The life of occlusions in actual-world faces photographs. on this paper, we gift exemplar-primarily based graph matching (EGM), a robust framework for facial landmark localization. In comparison to conventional algorithms, EGM has 3 blessings: (1) an affine-invariant shape constraint is found out on line from similar exemplars to better adapt to the take a look at face; (2) the most excellent landmark configuration may be immediately acquired by fixing a graph matching trouble with the learned from constraint; (three) the graph matching trouble can be optimized effectively by way of linear programming. To our first-rate knowledge, that is the primary try and observes a graph matching approach for facial landmark localization. Experiments on several difficult datasets demonstrate the Advantages of EGM over state-of-the-art methods. [27]

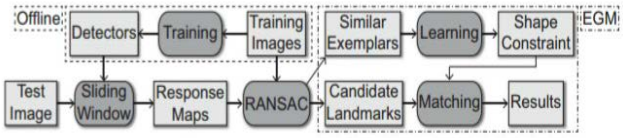


Fig.5 Pipeline of the proposed system for detecting facial landmarks [27]

G. Akshay Asthana1 Stefanos Zafeiriou1 Shiyang Cheng1 Maja Pantic , in this paper present a Robust Discriminative Response Map Fitting with Constrained , singular discriminative regression based totally technique for the limited nearby models (CLMs) framework, Referred to as the Discriminative response Map becoming (DRMF) approach, which suggests fantastic performance inside the everyday face becoming state of affairs. The inducement at the back of This approach is that, in contrast to the holistic texture based functions used within the discriminative AAM methods, the reaction map can be represented with the aid of a small set of parameters and these parameters may be very efficiently used for reconstructing unseen reaction maps. Furthermore, we show that through adopting quite simple off-the-shelf regression strategies, it is feasible to examine strong functions from response maps to the form parameters updates. The experiments, performed on Multi-PIE, XM2VTS and LFPW database, display that the proposed DRMF technique outperforms state of- the-art algorithms for the assignment of everyday face fitting. Furthermore, the DRMF approach is computationally very green and is actual-time capable. The current MATLAB implementation takes 1 2nd consistent with image. To facilitate future comparisons, we launch the MATLAB code1 and the pertained [8]

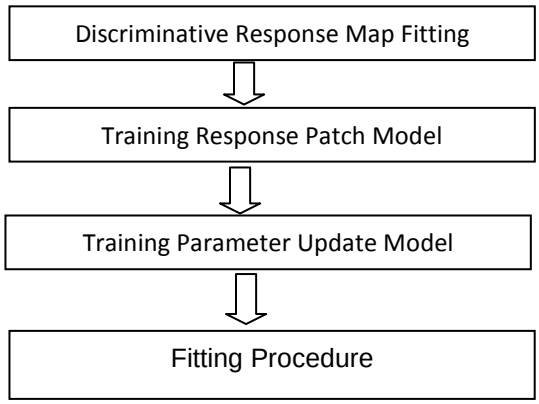


Fig. 6 discriminative Response Map Fitting methods [8].

H. Heng Yang1, Wenxuan Mou2 ,Yichi Zhang3 ,Ioannis Patras2 , [10] in this paper present a Cascaded Shape Space Pruning for Robust Facial Landmark Detection , Computer Laboratory University of Cambridge Cambridge, UK on this paper we suggest supervised initialization scheme for cascaded face alignment based totally on explicit head pose estimation. We first inspect the failure instances of most state of the art face alignment processes and study that these screw ups frequently share one commonplace international belongings, i.e. the top pose version is usually big. stimulated by this, we suggest a deep convolutional community version for reliable and accurate head pose estimation. in preference to the use of a median face form, or randomly selected shapes for cascaded face alignment initialization, we advocate schemes for generating initialization: the first one is predicated on projecting a median 3D face shape (represented by using 3D facial landmarks) onto second photo underneath the estimated head pose; the second one searches nearest neighbor shapes from a education set in keeping with head pose distance. by doing so, the initialization gets closer to the real shape, which complements the possibility of convergence and in turn improves the face alignment performance. We demonstrate the proposed technique on the benchmark 300W dataset

and display very competitive performance in both head pose estimation and face alignment.[10]

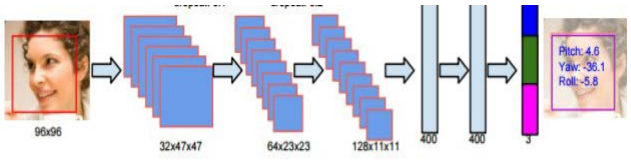


Fig.7 Convent model for head pose estimation [10].

I. Xiaowei Zhao Tae-Kyun Kim Wenhan Luo In this paper present Unified Face Analysis by Iterative Multi-Output Random Forests ,tend to gift a unified methodology for joint face image analysis, i.e., at the same time estimating head create, facial expression and landmark positions in real-world face images. to attain this goal, we tend to propose a unique unvarying Multi-Output Random Forests (iMORF) algorithmic rule, which explicitly models the relations among multiple tasks and iteratively exploits such relations to spice up the performance of all tasks. Specifically, a class-conscious face analysis forest is learned to perform classification of create and expression at the highest level, whereas acting landmark positions regression at very cheap level. On one hand, the calculable pose and expression give sturdy form before constrain the variation of landmark positions. On the opposite hand, a lot of discriminative shape-related options may well be extracted from the calculable landmark positions to more improve the predictions of create and expression. This connection of face analysis tasks is iteratively exploited through several cascaded class-conscious face analysis forests till convergence. Experiments conducted on in public on the market real-world face datasets demonstrate that the performance of all individual tasks square measure considerably improved by the planned iMORF algorithmic rule. additionally, our methodology outperforms state-of-the-arts for all 3 face analysis tasks. [35]

J. Yue Zhao, Jianbo Su in this paper present present Sparse learning for salient facial feature description, Face recognition attracts more and more attention for both wide applications and scientific challenges. This paper focuses on constructing associate economical facial feature description model for face recognition, which may complete 2 goals: (1) facial feature spatial property reduction; (2) salient facial feature choice. Thus, this paper proposes a brand new thin learning approach for salient facial feature description. The proposed technique foremost presents a facial feature transformation to get the coaching samples composed of within and between-class distance vector sets. Then, it proposes a sparse learning approach to find out the feature analysis vector based on the coaching samples.[29]

K. Yanke Ma, Ti Peng, Tong Zhang in this present present A Fast and Robust face Detection and Tracking Algorithm In this paper, the video is captured below traditional environmental conditions. First, interest regions is extracted by image process like Binary, grey conversion, bit operation and filtering. So extracting and sleuthing the face region by change Ad boost technique, finally, trailing the face region by Mean Shift trailing rule combined with the motion history image (MHI) [30]

L. Sukanga sagarika meher, pallavi Maben in this paper present a face recognition and facial expression identification using PCA , In this paper, the technique of principal part analysis for face recognition has been totally studied and enforced. Constant rule has even be adopted for countenance detection for each male and feminine faces. The Eigen face approach provides a sensible answer that's similar temperament for the matter of face recognition. This methodology is quick; reliable however works well in a very affected atmosphere. Experimental results show that PCA based mostly methodology give higher illustration and accomplish lower error rates for face recognition. [31]

M. D. Thuthi in this paper present a Recognition of facial expression using action unit classification technique, Dynamic Bayesian Network consistently models have inter-relationships among completely different level of facial activity. The projected work achieves vital improvement for facial expression and AU recognition. When put next to existing work the performance of the projected work is improved as shown in fig eight. In future work, we plan to Include head movements in extra modeling of AU temporal phases. It's necessary for understanding spontaneous expressions.[32]

N. Sourav Pramanik in this paper present a geometric feature based face sketch recognition has planned a unique technique to acknowledge a face sketch, supported extraction of facial parts. During which for feature extraction geometric model used and K-NN classifier has been used for classification. this is often totally {different completely different} and troublesome than face picture recognition as a result of faces are lot of different from sketches in terms of color, texture, and projection details of 3D faces in second pictures. For extraction of facial parts, we've used a geometrical model that has been mentioned during this paper.[33]

O. Nannan Wang , Jie Li in this paper present a heterogeneous Image Transformation in article Dacheng Tao, Xuelong Li , Xinbo bureau claimed that there existed 2 disadvantages for many accessible heterogeneous image transformation methods: (1) the number of nearest neighbors is mounted that incurs blurring impact or brings

in noise. (2) Some necessary detail data or high frequency data loses thanks to average of overlapping areas. SFS and SVR primarily based image improvement accustomed overcome higher than disadvantage [34].

## IV CONCLUSION

Face sketches square measure of times used as a method of visual in this letter, we have a tendency to propose a way for facial landmarks localization in second pictures of various modalities: face photos and face sketches. Supported the Cascaded cause Regression framework, our model is put together trained on each RGB pictures and synthesized sketch pictures, directly derived from the RGB pictures. The projected methodology performs on par with the opposite RCPR variants and higher than the opposite recent strategies on RGB pictures. It shows considerably higher results on sketch pictures from FSW dataset, collected within the wild, despite the very fact that the Model coaching is barely supported the face photos and their synthesized sketches.

## REFERENCES

[1] Cohn Y, Tian J, Kanade T: Recognizing action units for facial expression analysis. IEEE Trans. Pattern Anal. Mach. Intell 2001, 23[2]:97-114. 10.1109/34.908962

[2] 2 Pantic M, Rothkrantz LJM: Automatic analysis of facial expressions: the state of the art. *IEEE Trans. Pattern Anal. Mach. Intell* 2000, 22(12):1424-1445. 10.1109/34.895976

[3] 3 Heng Yang*, Renqiao Zhang* and Peter Robinson, Human and Sheep Facial Landmarks Localization by Triplet Interpolated Features, RESEARCH · SEPTEMBER 2015

[4] 4. Xiaowei Zhao, Shiguang Shan, Xiujuan Chai, Xilin Chen, Cascaded Shape Space Pruning for Robust Facial Landmark Detection I, in CVF pages 1033- 1040 ,2013

[5] 5. Park U, Jain AK: 3D face reconstruction from stereo images. In *Proc. of Int. Workshop on Video Processing for Security*. Quebec City, Canada; 2006:41-4

[6] 6. Salah , Alyüz N, Akarun L: Registration of 3D face scans with average face models. *J. Electron. Imag.* 2008, 17(1):011006. 10.1117/1.2896291

[7] 7 William Robson Schwartz, HuiminGuo, Jonghyun Choi, Larry S. Davis , Face Identification Using Large Feature Sets, in IEEE, pages 2245-2255

[8] Akshay Asthana1 Stefanos Zafeiriou1 Shiyang Cheng1 Maja Pantic Robust Discriminative Response Map Fitting with Constraine d, pages 3444- Local Models, in ICCV 3451, 2013

[9] Wiskott L, Fellous JM, Kruger N, von der Malsburg C: Face recognition by elastic bunch graph. IEEE Trans. Pattern Anal. Mach. Intell1997, 7: 775-779.

[10] Heng Yang1, Wenxuan Mou2 ,Yichi Zhang3 ,Ioannis Patras2 , Computer Laboratory University of Cambridge Cambridge, UK Face Alignment Assisted by Head Pose Estimation

[11] Dornaika F, Davoine F: Online appearance-based face and facial feature tracking. In *Proc. of Int. Conf. on Pattern Recognition*. Washington, DC, USA; 2004:814-817.

[12] Cohn J, Zlochower A, Lien JJJ, Kanade T: Feature-point tracking by optical flow discriminates subtle differences in facial expression. In Proc. of IEEE Int. Conf. on Automatic Face and Gesture Recognition. Nara, Japan; 1998:396-401

[13] Qi Zhu 1, Daoqiang Zhang 1, Han Sun 1, Zhengming Li 2 Combining L1-norm and L2-norm based representations for face recognition , in INTERNATIONAL JOURNAL FOR LIGHT AND ELECTRON OPTICS · APRIL , pages 2015

[14] Parkinson B: Do facial movements express emotions or communicate motives? Pers. Soc. Psychol. Rev 2005, 9: 278-311. 10.1207/s15327957pspr0904_1

[15] Ekman P, Friesen WV: Facial Action Coding System: A Technique for the Measurement of Facial Movement. Palo Alto: Consulting Psychologists Press; 1978.

[16] Akakın HÇ, Sankur B: Robust classification of face and head gestures in video. Image Video Comput 2011,29:470-483. 10.1016/j.imavis.2011.03.001View Article

[17] Bailenson J, Pontikakis E, Mauss I, Gross J, Jabon M, Hutcherson C, Nass C, John O: Real-time classification of evoked emotions using facial feature tracking and physiological responses. Int. J. Hum.-Comput. Stud 2008, 66(5):303-317. 10.1016/j.ijhcs.2007.10.011View Article d, pages 3444- Local Models, in ICCV 3451, 2013

[18] Pentland A, Moghaddam B, Starner T: View-based and Modular Eigenspaces for Face Recognition. In Proc. of IEEE Int. Conf. on Computer Vision and Pattern Recognition. Seattle, Washington; 1994. pp. 84–91

[19] Heisele B, Ho P, Poggio T: Face recognition with support vector machines: global versus component-based approaches. In *Proc. of IEEE Int. Conf. on Computer Vision*. Vancouver, British Columbia, Canada; 2001:688-694

[20] Shi J, Samal A, Marx D: How effective are landmarks and their geometry for face recognition? Comput. Vis. Image Understand. 2006, 102: 117-133. 10.1016/j.cviu.2005

[21] Tong Y, Ji Q: Multiview facial feature tracking with a multi-modal probabilistic model. In *Proc. of Int. Conf. on Pattern Recognition*. Washington, DC, USA; 2006:307-

[22] Chen J, Tiddeman B: Robust facial feature tracking under various illuminations. In *Proc. of* IEEE Int. Conf. on Image Processing. Atlanta, GA, USA; 2006:2829-2832.

[23] Wieghardt RPW J, von der Malsburg C: Gabor-based feature point tracking with automatically learned constraints. In Proc. of European Conference on Computer *Vision*. Copenhagen; 2002.

[24] Teijeiro-Mosquera L, Alba-Castro JL: Performance of active appearance model-based pose-robust face recognition. *Comput. Vis* 2011, 5(6):348-357. 10.1049/iet-cvi.2010.018

[25] Hu Y, Zhou M, Wu Z: A dense point-to-point alignment method for realistic 3D face morphing and animation. *Int. J. Comput. Games* Technol 2009, 2009: 9.

[26] Heng Yang, Ioannis Patras, Sieving Regression Forest Votes for Facial Feature Detection in the Wild, in ICCV , pages 1936-1943 ,2013

[27] Feng Zhou , Jonathan Brandt, Zhe Lin, Exemplar-based Graph Matching for Robust Facial Landmark Localization, in ICCV, pages 1025-1032, 2013

[28] Iacopo Masi, Independent Face Recognition by Localizing Local Binary Patterns via Deformation Components in22nd International Conference on Pattern Recognition

[29] YueZhao, Jianbo Su Sparse learning for salient facial feature description in IEEE International Conference on Robotics & Automation 2014
[30] Yanke Ma, Ti Peng, Tong Zhang A Fast and Robust face Detection and Tracking Algorithm.
[31] Sukanga sagarika meher, pallavi Maben face recognition and facial expression identification using PAC in IEEE International advance computing Conference (IACC) 2014.
[32] D. Thuthi Recognition of facial expression using action unit classification technique in International Conference on Recent Trends in Information Technology 2014
[33] Sourav Pramanik geometric feature based face sketch recognition in IEEE Proceedings of the International Conference on Pattern Recognition, Informatics and Medical Engineering, March 21-23, 2012
[34] Nannan Wang, Jie Li Heterogeneous Image Transformation in ARTICLE in PATTERN RECOGNITION LETTERS · JANUARY 2013
[35] Xiaowei Zhao Tae-Kyun Kim Wenhan Luo Unified Face Analysis by Iterative Multi-Output Random Forests in CVPR, 2014
[36] Heng Yang, Changqing Zou, and Ioannis Patras, Face Sketch Landmarks Localization in the Wild in IEEE SIGNAL PROCESSING LETTERS, VOL. 21, pages 1321-1325 11, NOVEMBER 2014

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