COMPUTER ANALYSIS OF ANTHROPOMETRIC MEASUREMENTS ON PHOTOGRAPHS FOR FACIAL IDENTIFICATION OF ADULT EGYPTIAN MALES

BY

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ABSTRACT

Today, throughout the world, photographs are still used as a method of identification. Attempts to recognize the Egyptian photographs by computer programs are less frequent than those of the recognition of some other phenomena in everyday life. The purpose of the present study was to identify the adult Egyptian face by tracing facial features and computer analysis of anthropometric measurements from the photographs. Two hundred sets of photographs (two photographs for each individual, the duration between the first and second photograph ranged from 3-5 years) showing facial features of Egyptian male volunteers aged from 28 to 62 years were obtained by standard photographic technique and scanned onto computer diskette. Fifteen different facial features were examined. Also, fourteen anthropometric measurements assessing the facial dimensions were measured by CorelDraw program (version 6) and compared between the two photographs of each individual. The morphological results showed that the fair hair and asymmetrical external eyebrow ends were the powerful discriminators between two photographs. Computer analysis of the objective data revealed no significant differences between the two photographs in all anthropometric measurements. No differences were observed between the two photographs in both interpupillary distance and width of one eye. While, the highest differences between two photographs were obvious in the mouth width on oral fissure line, followed by length of forehead but still insignificant. The present study demonstrated the benefit of computer programs to forensic field. At the same time, it illustrated that anthropometric measurements were the most accurate method of comparison between two photographs of the same person. Finally, this study suggests that photographs may be used as physical evidence when compared with known photographs of a suspect as they form somewhat of a signature of the suspect that is left behind on the evidence.

INTRODUCTION

The human face is a characteristic pattern most familiar to us when distinguishing people. Although recognizing human faces is one of our everyday activities, we are mostly not aware how the recognition actually works (Vezjak

and Stephancic; 1994).

The use of photographs to determine people 's identity has been used by authorities since the middle of the nineteenth-century. The increase in the use of photographs on individual identification credentials such as driving licenses, credit cards, security passes and passports has led, for the purpose of criminal activities, to facilitate identification of crime suspects by image comparison (Vanezis et al., 1996; Porter and Doran, 2000).

There have been number of studies carried out to assess facial features to improve the reliability of identification based on image comparison. These have been based on a consideration of anthropometric and morphometric parameter assessment or combination of both (Catterick, 1992).

Today, with the development and establishment of fingerprint technology, fingerprints became more widely used than the early photographs and proved to be a more reliable method of identification. On the other hand, fingerprint identification requires trained and qualified eyes and a fingerprint expert. Also, photographs are used so that a lay person, including customs officials, can make cursory identification by comparing the suspect in question with his/ her photograph (Knight, 1996; Porter and Doran, 2000).

The doctor should never risk an opinion on examining photographs, as he should remember that he is not an expert in photography whereas a photographer or an artist is better qualified to give an opinion on such a point (Fraklin, 1988). Measurements of the human face as a part of modern anthropometry mainly serve forensic and medical purposes. For reconstructive and cosmetic surgery, realistic sizes and proportion are assessed using anthropometric techniques and used as guidelines to correct deformities or disproportions (Vegter and Hage, 2000). Also in photo-superimposition, photographs of the skull are taken in exactly the same orientation in three planes as the available photograph (Miyasaka et al., 1995; Aulsebrook et al., 1996).

The identification method for facial comparison has four separate components (Porter and Doran, 2000):

1-Individual facial characteristics (scars, moles, dimples).
2-Facial symmetry.
3-Form, size and shape of facial features (nose, eyebrows, mouth, ears, forehead creases).
4-Anthropometric measurements.

The forensic anatomist must possess a sophisticated knowledge and practical skill in craniofacial anatomy. Because experienced anatomist, are not always available for this type of examination. Also,

cosmetic changes may affect the first three methods of facial comparison. So, anthropometric measurements are the most accurate method of identification (Loh and Chao, 1989).

Direct examination of original document photographs is often difficult due to the small size of the images, which are of ten different magnifications. The first stage of the present study was to reproduce the original photographs as larger sized prints and at the same magnification. The equivalent image was critical to the validity of the anatomical comparison to be made. Then, the second stage described, automatic technique, enabling accurate anthropometric measurements and tracing of facial features, which allowed direct physical comparison of document images for easy identification of the Egyptian face.

MATERIAL AND METHODS

An anthropometric study was devised to examine the facial proportions of the Egyptian face. One hundred Egyptian male volunteers between the ages of 28 and 62 years were photographed (frontal view) by standard photographic technique. Another frontal view photograph from each individual was taken after 3-5 years from the first one. Two photographs of each individual were transmitted onto computer diskette by scanner. The two photographs were magnified into the same magnifications by the computer, and then fifteen different types of facial feature categories were examined and the appropriate feature from the subset was selected. Also, fourteen anthropometric measurements of each photograph were taken for comparison between two photographs of each individual (Salmons, 1995). All measurements were made using CorelDraw program version 6 (to the nearest 0.05mm.).

Statistical Analysis:

The data of facial features was presented as number and percent distribution. The test of significance (Z) was calculated to compare the difference between observed proportions among the Egyptians and the Caucasians. Statistical comparisons were done between the two photographs of each Egyptian individual in all anthropometric measurements using the mean, standard deviation and paired "t" test. Significance was adopted at $P < 0.05$. All statistical analyses were performed by using the SPSS software statistical computer package version 12 (Dawson- Saunders and Trapp, 1994).

Anthropometric measurements (as shown in Fig. 1) were taken according to Salmons, (1995); Bush and Antonyshyn, (1996) and Porter and Doran, (2000) as the following:

1- Interpupillary distance: the horizon-

tal distance between the centers of both pupils.

2-Horizontal face width between the two ear roots: the distance between two ear roots parallel to interpupillary line and crossing the midline.

3- Mouth width on the oral fissure line: the distance between the widest points of the red-lip margins.

4-Nose width at the widest points of the alae (wings of the nostrils).

5-Length of the forehead: the distance from the hair line to the root of nose.

6-Length of the nose: the distance from its root to its tip.

7-Length of the mouth and chin: the distance from the tip of nose to the edge of chin.

8-Distance between the eyes: area between the two inner canthi.

9-Width of one eye(the left eye): the distance between inner canthus and outer canthus.

10- Distance between the nostril and the oral parting: the distance from the tip of nose to the horizontal line between both lips.

11- Distance between the oral parting and the mental sulcus.

12- Distance between the mental sulcus and the edge of the chin.

13- Length of one ear (the left ear): the distance from the highest point of the helix to the lowest point of the lobule.

14- Length of one eyebrow (the left eyebrow): the distance from medial to lateral ends of the arched hairy eminence surrounding the orbit.

RESULTS

The morphological results of facial features showed that number of features were of little value as discriminators. Table (1) revealed that the most unreliable and unpredictable feature subsets in the Egyptians were: the dark hair (70%), oval eye (63%) and curved eyebrow (57%). Furthermore, the best discriminators were those features in which agreement was high and feature occurrences in the photographs were relatively low. It was relatively easy to agree on what a dark hair was, with frequency in the population of about 70%. On the other hand, the fair hair and asymmetrical external eyebrow ends had a frequency of 3% and 5% respectively, thus making these features powerful discriminators.

The best discriminators in Caucasians were asymmetrical face, frizzy hair and asymmetrical external eyebrow ends (0.6 %). Whereas, the unreliable and unpredictable feature subsets were the down external eyebrow ends (85.2%), oval eye (79.8%), slight nostril visibility (74.8%) and both dark hair and rounded nose tip (66%). (Z) test illustrated the differences in percentage between Egyptian and Caucasian facial features (Table 1).

Table (2) demonstrated a comparison between the two photographs as regards the anthropometric measurements. There were no significant differences between the two photographs in all anthropometric measurements.

The highest mean differences with highest percentage change between two photographs were obvious in the mouth width on oral fissure line (0.010 ± 0.346 with percentage change 0.81), followed by length of forehead (0.008 ± 0.099 with percentage change 0.54). While the lowest mean differences with lowest percentage change between the two photographs were observed in length of ear "left ear" (0.0002 ± 0.006 with percentage change 0.02) and length of eyebrow "left eyebrow" (0.0005 ± 0.014 with percentage change 0.02).

Moreover, a gradual increase in the differences between two photographs was observed in length of mouth and chin (0.001 ± 0.032 with percentage change 0.02), the horizontal face width between two ear roots (0.002-± 0.017 with percentage change 0.05), distance between nostril and oral parting (0.002 ± 0.012 with percentage change 0.13), distance between two inner canthi (0.002 ± 0.087 with percentage change 0.13), distance between oral parting and mental sulcus (0.002 ± 0.011 with percentage change 0.25), nose width at the widest points of alae (0.004 ± 0.109 with percentage change 0.21) and length of the nose (0.005 ± 0.039 with percentage change 0.33).

The present study revealed no differences between two photographs in both interpupillary distance and width of one eye "left one".

DISCUSSION

Forensic photography, although similar to medical photography, has different aims, and different objectives. The main consideration is that the images are taken primarily for legal reasons, therefore the results must be accurate, detailed and of use in court. The photographer must have an understanding of the technical requirements as well as the related medical and legal requirements (Henham and Lee, 1994).

Anthropometry currently provided the

most widely accepted and clinically useful method for quantitative assessment of facial anatomy (Bush and Antonyshyn, 1996). According to this technique, the present study proved that by using 14 facial measurements in norma frontalis, it was possible to analyze, recognize and identify the adult Egyptian face.

As long ago as 1878, attempts had been made to define photographically the typical facial characteristics of persons exhibiting particular appearances or afflictions. State of the art numerical computing techniques facilitate definition of highly accurate facial composites (Benson, 1994).

Techniques that depend on measurements rather than strictly morphological parameters needed to be based on standardized photographs for assessment. So, the present study used CorelDraw program (version 6) to measure the facial dimensions from Egyptian photographs and compare between two photographs of each individual. This technique served as the current standard of quantitative facial assessment and has been used in the description of normal facial proportions (Farkas et al., 1985; Farkas and Kolar, 1987), in the determination of characteristic features in various craniofacial malformations and even to provide a normative database (Farkas et al., 1977 & 1989).

Referencewise, photographs of the front and profile views of the face may serve as a means of identification. The details of the features as regards the eyes, nose, ears, lips, chin and teeth should be carefully noted. The bridge of the nose may be narrow, flat or broad, and the nostrils may be distended or the reverse. The ears may be small or large in size. The lips may be thin or thick and the upper lip may hang over the lower lip, or may look shorter owing to the upper incisor teeth projecting outwards. The chin may be rounded, square or protruding (Knight, 1996).

The present study revealed that fair hair, asymmetrical external eyebrow ends, asymmetrical face, white and bald hair, were the best discriminators in facial features. On the other hand, dark hair, oval eye and curved eyebrow were the most unreliable features.

Vanezis et al., (1996) reported that the best discriminators in Caucasians were asymmetrical face, frizzy hair and asymmetrical external eyebrow ends. They also illustrated that the unreliable and unpredictable feature subsets were the down external eyebrow ends, oval eye, slight nostril visibility, dark hair and rounded nose tip.

In the present study, the mouth width on oral fissure line and the length of forehead showed the highest differences between two photographs. The highest dif-

ferences in the mouth width on oral fissure line might depend on the degree of smiling, while the length of forehead might be due to alopecia, which occurs in male especially in old age.

In this study, the lowest differences between two photographs were observed in length of one ear, and length of one eyebrow. These differences may be attributed into error in determining the accurate site, which must be measured by CorelDraw program in both photographs. These findings were coincided with Bush and Antonyshyn, (1996) who reported that the errors in localization of anatomical landmarks by computer program were minimal. This reflected the ability of the user to visualize anatomical landmarks adequately on the computer image and localize them without direct palpation of the surface.

CorelDraw program in this study demonstrated no differences between two photographs in both interpupillary distance and width of one eye. These findings were partially in agreement with Porter and Doran, (2000) who mentioned that interpupillary distances (44 mm) and horizontal face width between ear roots (99 mm) were equal in both photographs, while mouth width on oral fissure line decreased 1.5 mm and the nose width on septal /lip line decreased 0.5 mm between first and second photographs when the same magnification was done for the two photographs.

The present study concluded that, computer programs were very useful to forensic field and revealed that anthropometric measurements were the most accurate method of comparison between two photographs of the same person.

RECOMMENDATIONS

This study suggests that the use of identification photographs from falsified credentials may be considered useful as an investigative tool to obtain physical evidence. At the same time, the technique described in this paper is one, which produces physical evidence with which it is difficult to tamper, and in the current legal climate is more acceptable.

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Table (1): Proposed facial morphological classification in Egyptian males versus Caucasian males.

Features Category	Subset	Percentage % in Egyptian males	Percentage % in Caucasian males	Z	P
1-Facial form	1-Round	10%	6.8%	0.561	0.575
	2-Oval	28%	39.4%	1.556	0.120
	3-Square	19%	20%	0.00	1.000
	4-Angular down	36%	26.8%	1.249	0.212
	5-Asymmetrical	7%	0.6%	0.00	1.000
	6- Angular up	—	2%	0.711	0.477
2-Hair colour	1-Dark	70%	66%	0.455	0.649
	2-Fair	3%	23.4%	4.053	0.001*
	3-Grey	20%	8.6%	2.101	0.036*
	4-White	7%	1.8%	1.448	0.148
3-Hair length	1-Long	10%	7.4%	0.401	0.688
	2-Medium	32%	36.6%	0.536	0.592
	3-Short	38%	50.8%	1.679	0.093
	4-Partially bald	13%	2.6%	2.479	0.013*
	5-Bald	7%	1.8%	1.448	0.148
4- Hair form	1-Straight	9%	65.2%	8.080	0.001*
	2-Wavy	30%	20%	1.470	0.142
	3-Curly	45%	14.2%	4.616	0.001*
	4-Frizzy	16%	0.6%	2.034	0.042*
5-Eyebrow shape	1-Straight	43%	15.8%	4.066	0.001*
	2-Curved	57%	62%	0.576	0.564
	3- Arched	—	22.2%	4.772	0.001*
6- Eyebrow density	1-Sparse	31%	31.8%	0.030	0.978
	2-Thick	54%	49.2%	0.538	0.591
	3-Bushy	15%	8.6%	1.184	0.237
7-External eyebrow ends	1-Up	8%	1.4%	1.871	0.061
	2-Horizontal	31%	12.2%	3.059	0.002*
	3-Down	56%	85.2%	4.377	0.001*
	4-Asymmetrical	5%	0.6%	0.000	1.000
8-Eye shape	1-Round	17%	2.6%	3.187	0.001*
	2-Oval	63%	79.8%	2.472	0.013*
	3-Narrow (slit)	20%	27.2%	1.032	0.302
	4-Triangular	—	1.8%	0.599	0.549

*Significant

Table (1): Continued:

Features Category	Subset	Percentage % in Egyptian males	Percentage % in Caucasian males	Z	P
9-Nose tip shape	1-Pointed	12%	16.8%	0.765	0.444
	2-Rounded	53%	66%	1.729	0.084
	3-Bilobed	27%	7.2%	3.531	0.00*
	4-Hooked	8%	2.6%	1.389	0.165
	5- Bulbous	—	4.8%	1.756	0.079
	6-Snub	—	2%	0.711	0.477
10-Nostril visibility	1-None	23%	3.2%	3.940	0.001*
	2-Slight	36%	74.8%	5.377	0.001*
	3-Pronounced	41%	19.2%	3.206	0.001*
11-Nasal alae	1-Compressed	23%	8.2%	2.689	0.007*
	2-Slight	36%	56.6%	2.777	0.005*
	3-Flaring	41%	24.8%	2.288	0.022*
12-Upper lip thickness	1-Thin	31%	22.2%	1.248	0.212
	2-Average	52%	65.2%	1.751	0.080
	3-Thick	17%	12.6%	0.677	0.498
13-Lower lip thickness	1-Thin	22%	8%	2.574	0.010*
	2-Average	47%	58.8%	1.530	0.126
	3-Thick	31%	33.2%	0.182	0.856
14-Ear projection	1-Slight	31%	30.2%	0.031	0.976
	2-Medium	56%	5.2%	0.426	0.670
	3-Large	13%	13.4%	0.125	0.900
15-Chin shape	1-Dimple	31%	10.2%	3.462	0.001*
	2-Cleft	48%	33.4%	1.957	0.050
	3-Double-chin	21%	21.2%	0.139	0.890

*Significant

Table (2): Comparison between the studied groups as regards the anthropometric measurements.

Area measured (cm)/2photographs	*Mean ±SD of the first photographs*	*Mean ±SD of the second photographs*	*Difference between 2 photographs*	*% change*	*t (paired)*
Interpupillary distance	*2.015±0.210*	*2.015±0.210*	*0.00± 0.00*	*0.00*	*0.00*
Horizontal face width between 2ear roots	*4.159±0.295*	*4.161±0.296*	*0.002±0.017*	*0.05*	*1.32*
Mouth width on oral fissure line	*2.145±0.467*	*2.135±0.493*	*0.010±0.346*	*0.81*	*0.28*
Nose width at widest points of alae	*1.129±0.171*	*1.125±0.164*	*0.004±0.109*	*0.21*	*0.29*
Length of forehead	*2.060±0.440*	*2.068±0.442*	*0.008±0.099*	*0.54*	*0.78*
Length of nose	*1.492±0.284*	*1.487±0.286*	*0.005±0.039*	*0.33*	*1.25*
Length of mouth and chin	*2.386±0.210*	*2.385±0.210*	*0.001±0.032*	*0.02*	*0.19*
Distance between two inner canthi	*1.115±0.155*	*1.113±0.130*	*0.002±0.087*	*0.13*	*0.28*
Width of one eye (left eye)	*0.804±0.146*	*0.804±0.146*	*0.00± 0.00*	*0.00*	*0.00*
Distance between nostril and oral parting	*0.796±0.069*	*0.798±0.071*	*0.002±0.012*	*0.13*	*0.93*
Distance between oral parting and mental sulcus	*0.797±0.072*	*0.795±0.074*	*0.002±0.011*	*0.25*	*1.70*
Distance between mental sulcus and chin	*0.7967±0.071*	*0.7973±0.068*	*0.0006±0.016*	*0.13*	*0.37*
Length of ear (left ear)	*1.6662±0.167*	*1.6664±0.166*	*0.0002±0.006*	*0.02*	*0.33*
Length of eyebrow (left eyebrow)	*1.5391±0.228*	*1.5386±0.227*	*0.0005±0.014*	*0.02*	*0.36*

**Significant<0.05*

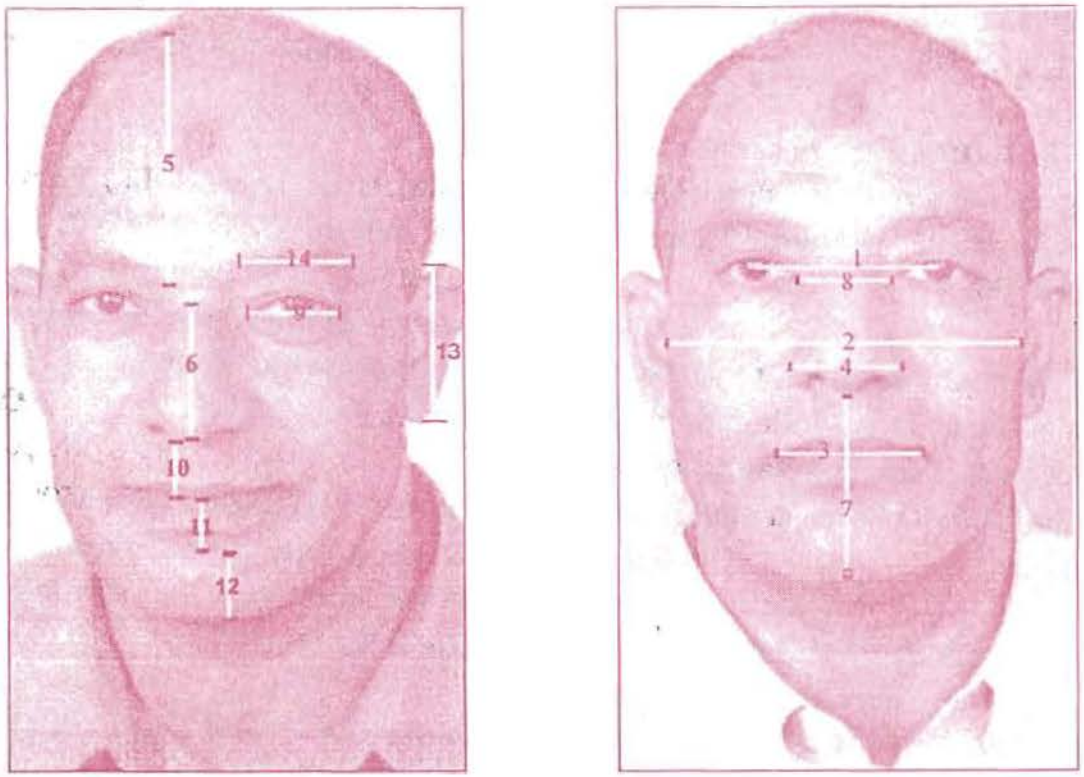

Fig. (1): Photographs showing anthropometric orientation lines.

1 - Interpupillary distance.
2 - Horizontal face width between the two ear roots.
3 - Mouth width on the oral fissure line.
4 - Nose width at the widest points of the alae.
5 - Length of the forehead.
6 - Length of the nose.
7 - Length of the mouth and chin (from the tip of nose to the edge of chin).
8 - Distance between the eyes (area between the two inner canthi).
9 - Width of the left eye.
10- Distance between the nostril and the oral parting.
11- Distance between the oral parting and the mental sulcus.
12- Distance between the mental sulcus and the edge of the chin.
13- Length of the left ear.
14- Length of the left eyebrow.

REFERENCES

Aulsebrook, W. A.; Becker, P. J. and Iscan, M. Y. (1996) : "Facial soft tissue thickness in adult male zulu ". Forensic Science International, 79: 83-102.

Benson, P. J. (1994) : " On facial composite image prototyping as a descriptive and diagnostic tool". J. Audiov. Media Med., 17(1): 27-30.

Bush, K. and Antonyshyn , O. (1996) : "Three dimensional facial anthropometry using a laser surface scanner: Validation of the technique". Plast. Reconstr. Surg., 98 (2): 226-235.

Catterick, T. (1992) : " Facial measurements as an aid to recognition". Forensic Science International, 56:23-27.

Dawson-Saunders, B. and Trapp, R. (1994) : Basic and Clinical Biostatics. 2nd edition, Lang Medical Book, Prentice- Hall International Inc.

Farkas, L. G. and Kolar, J. G. (1987) : "Anthropometrics and art in the anaesthetics of women 's face". Clin. Reconstr. Surg.,14: 599.

Farkas, L. G.; Hreczko, T. A.; Kolar, J. G. and Munro, I. R. (1985) : "Vertical and horizontal proportions of the face in young adult North American Caucasians: Revision of neoclassical canons". Plast. Reconstr. Surg.,75: 328.

Farkas L. G.; Ross R. B. and James, J. S. (1977) : "Anthropometry of the face in lateral facial dysplasia: The bilateral form". Cleft Palate J., 14: 41.

Farkas, L. G.; Ross, R. B. ; Posnick, J. C. and Indech, G. D. (1989) : "Orbital measurements in 63 hyperteloric patients: Differences between the anthropometric and cephalometric findings". J. Craniomaxillofac. Surg.,17: 249.

Fraklin, C. A. (1988) : Personal identity. In : Medical Jurisprudence and Toxicology. 21 ed., Bombay N.M. Tripathi Private limited, P.52.

Henham, A. P. and Lee, K. A. (1994) : "Photography in forensic medicine ". J. Audiov. Media Med., 17(1): 15-20.

Knight, B. (1996) : The establishment of identity of human remains. In : Forensic Pathology. Edward Arnold (Ed.), A division of Hodder and Stoughton, London, Melbourne, Auckland, P.P.96, 130-132.

Loh, F. C. and Chao, T. C. (1989) : "Skull and photographic superimposition: a new approach using a third party ' s interpupillary distance to extrapolate the magnification factor". J. Forensic Sci., 34:708-713.

Miyasaka, S.; Yoshino, M.; Imaezumi, K. and Seta, S. (1995) : " The computer aided facial reconstruction system ". Forensic Science International,74: 155-165.

Porter, G. and Doran, G. (2000) : " An anatomical and photographic technique for forensic facial identification". Forensic Science International, 114: 97-105.

Salmons, S. (1995) : Muscle. In: Gray's Anatomy. Williams, P.L.; Bannister, L.H.; Berry, M.M.; Collins, P.; Dyson, M.; Dussek, J.E.; Ferguson M.W.J.(Eds.), 38th. ed, Churchill Living Stone, New York, Edinburgh, London, Tokyo, Madrid, Melbourne,P.P.792-794.

Vanezis, P.; Lu, D.; Cockburn, J.; Gonzalez, A.; Mc Conbe, G.; Trujillo, O. and Vanezis, M. (1996) : " Morphological classification of facial features in adult Caucasian males based on an assessment of photographs of 50 subjects". J. Forensic Sci., 41(5):786-791.

Vegter, F. and Hage, J. J. (2000) : "Clinical anthropometry and canon of the face in historical perspective ". Plast. Reconstr. Surg., 106 (5): 1090-6.

Vezjak, M. and Stephancic, M. (1994) : "An anthropological model for automatic recognition of the male human face ". Ann. Hum. Biol., 21(4): 363-80.

تحليل الكمبيوتر للقياسات الأنثروبومترية على الصور للإستعراف الوجهي للرجال المصريين البالغين

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حتى اليوم مازالت الصور تستخدم كطريقة للإستعراف في كل مكان من العالم.و المحاولات لتمييز صور المصريين باستخدام الحاسب الآلي قليلة عن الظواهر الأخرى المستخدمة في حياتنا اليومية.

والغرض من هذا البحث هو الإستعراف على الوجه المصري من تتبع ملامح الوجه وتحليل الكمبيوتر للقياسات الأنثروبومتريه من الصور . وقد أخذت ٢٠٠ صوره (صورتين من كل شخص تراوحت المدة بين الصورة الأولى والثانية من ٣-٥ سنوات) تمثل ملامح الوجه لرجال مصريين متطوعين تراوحت أعمارهم بين ٢٨- ٦٢ سنه. و أخذت هذه الصور بطريقه موحدة حيث أدخلت إلي الحاسب الآلي باستخدام الماسح الضوئي.

تم فحص خمسة عشر ملامح مختلفة للوجه. كما تم أخذ أربعة عشر مقاسا لتقييم أبعاد الوجه واستخدم برنامج كوريل (ميل ٦) لقياس هذه الأبعاد في الوجه .وتم مقارنة هذه الأبعاد في كل من الصورتين . وقد أوضحت النتائج الوصفية الشكلية أن الشعر المموه وعدم تماثل نهاية الحاجب الخارجية كان أقوى مميز بين صورتين. وأظهر تحليل الحاسب الآلي على هذه البيانات المرئية عدم وجود فروق ذات دلاله إحصائية في كل صورتين في جميع الأبعاد. كما لم توجد فروق بين الصورتين في كل من المسافة المحصورة بين حدقتي العين وعرض العين الواحدة. ولكن أعلى فروق بين الصورتين قد لوحظت في عرض الفم عند الخط الفاصل بين الشفتين وطول الجبهة ولكنها دون دلاله إحصائية.

وقد أوضح هذا البحث أهمية برامج الحاسب الآلي في مجال الطب الشرعي، و بين فى نفس الوقت أن استخدام القياسات الأنثروبومترية كانت هى أدق طريقه للمقارنة بين صورتين لنفس الشخص.

و أخيرا فإن هذا البحث يقترح استخدام الصور كدليل مادي عندما تكون هناك صوره للشخص المشتبه به والتي تشكل إلي حد ما توقيع يتركه المشتبه به خلفه كدليل.