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## **Facial Recognition**

**Mihalache Sergiu<sup>1</sup>, Stoica Mihaela-Zoica<sup>2</sup>**

**Abstract:** During their lifetime, people learn to recognize thousands of faces that they interact with. Face perception refers to an individual's understanding and interpretation of the face, particularly the human face, especially in relation to the associated information processing in the brain. The proportions and expressions of the human face are important to identify origin, emotional tendencies, health qualities, and some social information. From birth, faces are important in the individual's social interaction. Face perceptions are very complex as the recognition of facial expressions involves extensive and diverse areas in the brain. Our main goal is to put emphasis on presenting human faces specialized studies, and also to highlight the importance of attractiveness in their retention. We will see that there are many factors that influence face recognition.

**Keywords:** facial recognition; attractiveness; perception; memory

### **1. Perception**

From the base level mental processes, perception plays an important role. Subjects, who are in front of images representing faces of young people, are bombarded with a number of extremely high-light stimuli, forms, diversity, fine lines, general facial structure and details. It is known that perception is the mental processing and interpretation of sensory information in the form of an image important for the subject.

With reference to visual perception, more involved in the situation, it has an enlightening part-perceptual image, made by combining all existing stimuli. Thus, perception takes place way of perceiving reality which later will facilitate all other processes influencing visual memory.

### **2. Memory**

If we were to identify perception's determinants, surely that we turn to the quality and sensory modality, duration being a factor which relates the relation between the action of stimuli, referred to the image presented and the duration of the perceptual process; the age of subjects is a factor that influences the dynamics of perception; gender differences are a key factor which reveals the importance; behavioral elements and personality traits predispose individuals to perceive in a manner consistent with them - the best proof of this is the projective personality tests ( Aniței, 2010).

Except, as we said, in this study memory, short term memory and iconic memory works, bringing a significant contribution to the achievement and understanding many aspects.

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<sup>1</sup> Student, Danubius University of Galati, Faculty of Law, Romania, Address: 3 Galati Blvd, 800654 Galati, Romania, Tel.: +40372361102, Fax: +40372361290, Corresponding author: mihalache.sergiu91@gmail.com.

<sup>2</sup> Student, Danubius University of Galati, Romania, Address: 3 Galati Blvd, 800654 Galati, Romania, Tel.: +40372361102, Fax: +40372361290, E-mail: stoica.mihaelazoica@gmail.com.

Memory can be defined generally as a mechanism of cognitive encoding, storage, and update the information that the man touches. Past experience is maintained, rearranged, and then used in activities and different situations which man is contact. As a form of memory, MSD is the way in which information is retained immediate moment we are working on. We know that MSD has a limited capacity, it may contain an average of 7 items, plus or minus 2. Since 1885 Ebbinghaus found tha himself has a short memory capacity of 7 units of information. Besides that temporarily stores information, MSD longer serves as working memory (Aniței, 2010).

Iconic memory is sensory memory of visual stimuli. Picture frames printed in iconic memory is extremely short, research indicating that it takes about ¼ sec. Iconic memory store images exactly like a photo. So, people who can see mental the visual stimuli, have memories “photographic”, but which is kept very short time.

In the true sense of word, it is important to note that photographic memory is one that lasts more than a few tenths of a second. This memory is called eidetic memory, but very few people hold it, being more common in children who can look at a picture, then have their picture taken away, and in a few minutes they can remember picture with an exceptional clarity. This ability is lost with age and in most cases disappears completely.

### **3. Studies on Human Faces**

Start researching human faces was given by German scientist Francis Galton (1800), in an attempt to find common elements of a certain type of people, criminals and soldiers, concluding that faces which are more attractive and catchy are easily to remember.

Starting from Francis Galton, researchers conducted computer model combining facial parts more people to build “average face” man.

“Average face” was performed taking into account the following characteristics: the distance between the pupils, facial symmetry, shapes eyebrows, nose, mouth, and thus the process used has proven to be more productive than methods used by Francis Galton, who basically had a string of photos, and also at that time technological resources were limited.

With the advancement of technology, the methods used to build the “average face” generated the following - faces constructed of separate items attached, proved to be more productive than individual elements of facial studied.

As a result of this research established “average attractiveness theory” which explains that average faces are more easily represented in the visual system, which is also due to the association that people make between people, effect being called perceptual bias.

For thousands of years, man has been fascinated by the human face and made numerous attempts to reproduce it, both in art and in everyday life. There have been numerous studies to quantify the perfect face shape, ideal or most beautiful. It have been tested many ideas, and numerous scientists and philosophers have devoted their energy in this regard. A significant number of researchers have concluded that facial beauty can be quantified, but few of them can say with certainty that broke the “code of beauty.”

The Greeks said that all beauty is mathematics. If this is true, maybe a mathematical code, a formula, a relationship, even a number could describe facial beauty and why we are attracted by it. This

relationship is called the “Golden Ratio”. It is a mathematical number, phi - 1.61 -, which occurs commonly in all things nature considered to be beautiful.

#### **4. Influence of Attractiveness in Face Recognition**

Using mathematics, few researchers from California managed, using computer and special software to achieve a face with a high degree of attractiveness, considered to be beautiful. To have a historical basis, scientists began to study the faces of women known as extremely attractive, perhaps symbols of beauty, from ancient Egypt, Greece and the Roman Empire reached until the twentieth century. Thus, women like Nefertiti, Venus from Milo, Greta Garbo, Marilyn Monroe had a face that fits very much with the mask made by American researchers. These coincidences and similarities are not coincidental, proving that beauty depends on numbers and proportions.

The attractiveness and sympathy represent strength in the relationships we develop. The attractiveness is defined as an individual's conception regarding ideal appearance, which gives greater pleasure senses.

Determinants of physical attractiveness are generated naturally by physical appearance, and biologically by the link and balance between partners, Hartfield and Sprecher (1986) emphasizing that people choose their partner according to their attractiveness.

Each person is attracted by those persons of high fitness, who have handsome features and whose health is evidenced by appearance, by the symmetry of the body. In reverse, people who are less attractive are suspected of various malformations, specifically the lack of symmetry bodily and facial.

Anthropological studies have highlighted a number of factors influencing the attractiveness of a person and the extent to which we feel drawn to it. As particular aspects of male attractiveness can be considered: height and posture - are seen as more attractive men who are taller by a few inches than average and have a straight body posture; Physics - constituent of masculinity is the muscles, but not to an extent disproportionate to normal; hair - hair shape is not a strong point in terms of attractiveness, but its color may be a factor influencing decisions in a community based culture; face shape - prominent cheekbones, strong jaw with a slightly elongated face are indicative of masculinity, and in Western societies a face with these traits is considered very attractive.

Regarding women, particular aspects can be considered feminine attractiveness: Waist- hip ratio - an important role in evaluating the attractiveness it has 0.7 ratio (waist circumference is 70 % of the hip circumference) - so women who meet this standard are considered as the most attractive, regardless of culture; body structure and body mass index - are set standards in these areas depending on the culture in the West is appreciated kind slender, thin, supple, while other cultures focuses on such sturdy, chubby; facial symmetry - featured symmetrical faces are considered attractive.

Other indicators of beauty are attractiveness prototype and skin color. Beauty prototype is based on the idea that symmetrical faces and familiar ones are more attractive. Preference for skin color changed with time, passing along the history of the preference for white skin to tan skin.

Following several studies, it has concluded that men prefer women with traits faces child, with big eyes, round and separate, small nose, full lips and chin smooth and elongated. Women are prone to choose their partner and are generally attracted to men with stature for safety and upright posture for esteem, trust and respect are imposed by these features

## **5. Studies on Attractiveness and Facial Recognition**

In the literature there are many studies on facial attractiveness and recognition based on various criteria such as age of participants, the attractiveness of faces, storage capacity.

Olson and Marshuetz (2005) conducted a study whose assumption was that beauty can be perceived by a very short exposure. Subjects were running some pictures that featured faces of the opposite sex, but they were taken with a mask on the face or in low light conditions so that only the defining features of the face could be distinguished. It is aimed at identifying which subjects considered an attractive person: facial symmetry, degree of femininity / masculinity of features.

It is a truism that physically attractive people collect more benefits over the life: enjoy higher wages, for a wider variety of partners, favoritism in the hiring and promotion, career faster are seen as smarter, more extroverted, many social qualities. Some instructors or teachers, most attractive and efficient enjoy greater popularity. In the meantime, beautiful children are punished less severely, and babies get more attention.

Recent studies have investigated what constitutes beautiful traits of human faces and how beauty affects social judgment of men, but little is known about perception and cognitive processing. In another study aimed to correlate neural activity with facial attractiveness, and by using fMRI (MRI - magnetic resonance imaging) “functional magnetic resonance” imaging centers ventral occipital activation was observed previously insular, dorsal posterior parietal, inferior dorsolateral and medial prefrontal they are correlated with the attractiveness of facial parameters (Aguirre, Chatterjee, Smith, Thomas). It also noted the lack of stimulation of these areas the appearance of low- attractive photos. Aguirre 's study, Singh & D' Esposito (1999), “ Stimulus inversion and the response of face and object -sensitive cortical Areas “ on the link between neural activity and facial recognition was also performed using the MRI machine.

A fundamental challenge in face recognition is to identify important characteristics of faces, those participating in the greatest weight in evaluating a human face. Janda Sadr and Sinha (2003) points out that features “star” are certainly mouth, eyes and nose, and their study confirms the surprisingly important role brow shape features. Their role in emotional expressivity and nonverbal communication is important, but it can add important role in facial recognition. Here is reported the experimental result that suggests that for facial recognition the eyebrows may be the same influences as the eye. Thus, absence of eyebrows from some familiar faces can create great confusion and a great decrease in the ability of recognition. Monkeys & Demi Moore. Photos used by Janda, Sadr and Sinha (2003).

The phylogenetic evolution of our species has been significant reductions in facial hairiness. Thus, the continued presence of the eyebrows may be a curiosity. They eyebrows actually practical purpose or are just a vestige of evolution? They may provide a modest eye protection against perspiration, rain or sunlight. However, their role is important in face recognition and human face aesthetics.

There are studies about how age influence recognizing and memorizing faces. Lamont, Stewart - Williams and Podd (2005 ) studied to what extent participants' age influences memory and showed that known face recognition accuracy declines with age, but this decline due to age occurs only with photos showing young girls.

Above studies focus on different aspects of attractiveness and facial recognition. There are a few studies on the issue of the influence of gender in face recognition. In a study on the influence of gender, race, age and beauty of face recognition developed at the University of Saint -Louis, Missouri, Cross, Cross and Daly (1971) showed that there are differences in the recognition of faces by gender,

such as: women recognized faces of women more frequently than men's faces, while men recognize faces of men and women equally.

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