Future Path Way to Biometric

C.N .Ravi Kumar   *kumarcnr@yahoo.com*
Professor & Head of Department
Dept of Computer Science & Engg
S. J. College of Engineering
Mysore, India.

P. Girish Chandra   *p.girishchandra@gmail.com*
Dept of Computer Science & Engg
S. J. College of Engineering
Mysore, India.

R. Narayana   *narayanark17@gmail.com*
Dept of Computer Science & Engg
S. J. College of Engineering
Mysore, India.

Abstract

The nature of Pattern Recognition employing Biometric system causes the fact that not only the verification & identification system becomes practical but also enables recognition of the character and serves as a tool in diagnosing the disease of a person. One of the main interests for Biometric System is identification of person's psychological traits and personality types which can be accomplished by classifying the Biometric into different levels. Existing Biometric system can identify or verify the person but cannot declare the personality of a Person. Face and Hand provides Researchers and Psychologists with instrument of obtaining information about personality and psychological traits. Initially the paper describes the Different level of Biometric and need for classification. Later the paper mentions some of technologies to explore the entire field of personality through the skillful use of the computer data processing and biometric scanning. Applications of Personality Analysis include, but are not limited to, for use in daily living, private industry, civil service, education, law enforcement, military, medicine and psychology, throughout all aspects of human life.

Keywords: Personality, Biometric Levels, Gunas, Physiognomy, Psychometrics, Phase Facial Portrait, Ophthalmogeometry.

1. INTRODUCTION

In the field of biological sciences the terms "Biometrics" and "Biometry" are used from the beginning of the 20th century for the development of statistical and mathematical methods applicable to the problem of data analysis. Earlier the term "Biometrics" was used for Statistical methods for the analysis of data from agricultural field experiments to compare the yields of different varieties of wheat, for the analysis of data from human clinical trials evaluating the relative effectiveness of competing therapies for diseases, or for the analysis of data from environmental studies on the effects of air or water pollution on the appearance of human disease in a geographical area. Of late the terms are used to refer to identification technologies [10].

Each biometric characteristic has its own advantages and disadvantages, A number of biometric characteristics has been proposed for authentication purposes. Traditionally, they can be categorized into two major groups: physical or behavioral characteristics. Examples of physical characteristics include: DNA, Ear, Face, Fingerprint, Hand Geometry, Iris, and Retina. Behavioral characteristics include: Gait, Signature, and Voice. A summary of those characteristics can be found in [1] to [11].

Currently the hardware and software gadgets dedicated to human biometrics is mainly used for identification and verification purposes. This requires recording in some fashion an image of the subject that can later be utilized as a template to identify another image of the same part of that subject. These technologies are used to identify or authenticate persons based upon their physical characteristics stored as graphical information and/or digital data and templates about a person for identification or verification purposes [10][12].The application of biometrics can be found in the Medical, Convenience, and Security Biometrics.

2. HISTORICAL LAPSES AND CONTEMPORARY PERSPECTIVE IN BIOMETRICS

Till date the Biometric System was able to solve the significant problems in the field of identification & verification. How ever the research works taken up in these fields cannot determine the complete personality of a person using present Biometric system. The so many varied types of biometrics and also the depth that can be realized in each Biometric approach have motivated us to see the entire stretch of Biometric under various categories. The awareness of stretch has lead to the realization of the need for classification.

Looking at the vast potential application of biometrics, it is advisable to group the Biometrics based upon the purpose for which it is used. In the present context we feel the identification and verification using various Biometric systems can be classified as Biometric-I.

It is observed from Vedic time which is as old as 2000 BC the characters of an individual can be identified /read by analyzing the impressions of various human parts like Face, Hand, Ear ,etc. This analysis can be grouped as Biometric-II

Of late, a lot of research work is observed to identify various diseases that a person has by observing various parts of the body which can be collectively categorized as Biometric-III.

3. BIOMETRIC –II : JUDGING HUMAN CHARACTERS

Albert Einstein The great physicist said, "Time is the fourth Dimension". Vedas say that "Time is the first dimension". They say "in the beginning there was nothing"[17].Yes indeed Vedic literature contains knowledge about all fields. According to Vedas all material elements are infused with the modes of nature or gunas- satva, rajas, and tamas [18]. The description of human being in term of nine lotus petals and the three gunas or qualities occurs repeatedly in vedantic literature. Its first appearance is in atharva Veda. The summary of the same is as follows: "There is the nine-portalled lotus covered under three bands, in which Lives the Spirit with the atman within that the Veda-Knowers Know". The three bands are three gunas or psychological qualities well known as satva , rajas ,and tamas , balanced dynamism , uncontrolled activity, inertia[19].

The each three gunas includes attributes in it. Satva guna is characterized by qualities such as cleanliness, truthfulness, gravity, dutifulness, detachment, discipline, mental equilibrium, respect for superiors, contentment, sharp intelligence, sense control, and staunch determination. Attributes of rajas guna include intense activity, desire for sense gratification, little interest in spiritual elevation, dissatisfaction with one's position, envy of others, and a materialistic mentality. Qualities associated with tamas guna include mental imbalance, anger, ignorance, arrogance, depression, laziness, procrastination, and a feeling of helplessness [18]. The more explanation of gunas can be found in [18] [19].

The above mentioned gunas are refered in Big Five model ,the most popular model of psychological traits is a five-dimension personality model, as Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism .In contemporary psychology, the "Big Five" factors of personality are five broad domains or dimensions of personality which are used to describe human personality [46].

3.1. Methods for Characteristics Recognition

It is well known that "you can't manage what you don't measure", so measuring characteristic is also important. To measure human characteristics or identify personality types psychological researchers apply psychometric which is the field of study including the theory and technique of psychological measurement. Psychometric involves such research tasks as the construction of instruments and procedures for measurement; and the development of theoretical approaches to measurement [47].

Recent investigations have insisted on a difficulty inherent in all attempts to judge a person character [48]. The trait of a character which will be ascribed to a person depends on the situation in which the person's behavior is being observed. Therefore the outcome of psychometric methods may not be accurate, consistent and reliable.

The Biometric-II judges the characteristics of a person taking into account his body type, face, hand, sleeping style, walking gait and such other aspects. Thus the physical appearance comes into greater focus on the grounds that they are constant factors not governed by the intentions of an individual. If these two different approaches are fused, the forthcoming results will be accurate, reliable and consistent.

Of the various analysis adopted to judge the characteristics, we would like to confine ourselves to face analysis and hand analysis. The reason why these two have been chosen is that hand and face analysis themselves are very vast domains. Just the analysis of face involves study of as many aspects as position, shape and size of parts like ears, eyes, nose, mouth, chin, cheeks, forehead, temple, eyebrows and so on. Now coming to hand, again its shape, color, hand geometry, palm-lines, their texture, position, points of their beginning and end, style, fall into the focus of our study. The following sections delineate the role of face and hand in the judging the characteristics of persons.

3.2. Approaches to Character Recognition from Face Analysis

Two important factors help us get a sense of how face reading is 'wired' into the human experience. The role face plays in communication and the relationship between the body and the mind in terms of Vedic Psychology.

Western psychology considers distinctive universal expressions for anger, fear, disgust, sadness, enjoyment, contempt, surprise and interest for character recognition. The face is the index of the mind. It reveals the nature of childhood, past lives, and gives insight into the individual's propensities and aptitude. The basic idea behind Vedic face reading is that the gross physical body is lying on the subtle body which has been in development for many lifetimes In this regard the whole body can be a source of information. Some of this is described in the Vedic text dedicated to this subject (Samudrika Shastra). Although the whole body carries information the face is the most informative part of the body because it is the most muscularly complex.

There are three main approaches to Psychological characteristics recognition from face. Physiognomy, phase facial portrait and ophthalmogeometry, the first originally interprets different facial features; the second works with angles of facial features and facial asymmetry, and the third extracts and interprets eye region parameters. Physiognomy is a theory based upon the idea that the assessment of the person's outer appearance, primarily the face, facial features, skin texture and quality, may give insights into one's character or personality. According to Atharva Vedic "Muhasastra" by observing the face of a person as a whole, one can get a keen idea of what his characteristics are like starting from childhood till his old age.

The general study of regions such as Parents' region, Career and Success region, Life region, Middle Age region Love and Emotional region, Fertility and Children region, Old Age region give an idea about health of parents, career prospects of the individual. attitude towards life, earnings, longevity, negative qualities, poor health, conjugal problems, deep emotional involvement in

matters of love, its failure, procreation, energy, childlessness, early death, happiness or desolation in old age, dangers of drowning, poisoning and food or water-borne diseases.

Shapes of faces such as Round, Square, Rectangular, Triangular and also straight face, concave face, convex face represent laziness, dullness, creativity, humor, fastidiousness, toughness, aggressiveness, offensiveness, sociability, strong physique, honesty, quality for diplomacy and leadership, competence to work as executive and official, anger, being unskilled yet boastful and rough, temperamental cheerfulness and brilliance, hyperactiveness and sensitivity, disturbed married life, equipoise, pessimism, happily disposed optimism, refinement in nature, criminal tendency, self-reliance.

Forehead, Eyebrows, Eyes, Colour of Eyes, Nose, Lips, Mouth, Chin, Jaw help recognize intelligence, opulence one enjoys in life, impediments encountered in one's career, longevity, broad mindedness, perfection in work, want of seriousness, snobbery, prudence, calculative nature and insecure mind, instability and agitation, untrust worthiness, untimely death, cruelty and perversion, inability to hide affections and emotions, secretiveness, extroversion, cynicism , flirtation, highly impressionable and affectionate disposition, inventive and adaptable nature, passion, tenderness, egotisim, escapism, stability of mind, extravagance, cheerfulness and friendliness, oscillation and depression, sensuousness, graceful behavior, erudition, introversion, generosity, humor, diligence, steadiness, flexibility, will power and energy. In general it is observation of outer body in estimating the inner self of a person.

3.3. Approaches to Character Recognition from Hand Analysis
The ancient Indian sages gave the out knowledge of the hand, which they gathered through the means of seeing, touching and analyzing. The knowledge thus gain threw light on all the aspects of life. The Indian tradition holds that Anga(limbs) vidya (hand analysis) was first invented by the Sea God 'samudra' it was there after developed and handed down to humanity by the sages like Narada & Gargya. Lord Skanda is held to be the patron deity of this science .Further the study of the hand analysis spread in different country grew, flourished and found favour in the firmament of knowledge [28].
There are two key to successful works with the hands. Primarily the ability to be observant and second key is an ability to compare and contrast each feature. Another valuable tool in the world of hand analysis is a system to organize all the clues find in a hand. The order in which all the hand features dealt is also very important [29].

From the point of view of hand psychology, the hand is divided into three zones as shown in figure 1. The first zone, which includes the thumb and the index finger and the portion below them, gives knowledge of environment and conscious behavior and the will power. The second zone includes the ring finger and the little finger and the portion below them. This zone is a good indicator of the subconscious mind and the hidden characteristics of the person. The middle zone is the social zone and it indicates the social adaptability of the person [28].
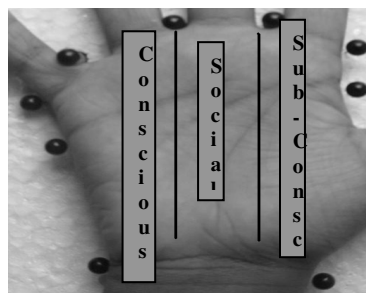

FIGURE 1: Three Zones on Hand.

The science of the hand is based on the shape of the hand. It can be pointed out here that the shape of the hand is so important that by its , one can know the type of mind is directing the subject's activities in life. By the formation of the Dog's foot one can tell for what particular kind of chase it is most suited; by the shape of the Horse's hoof one can tell what is the breed and what qualities particularly distinguished. In the same way, the shape of the hand sums up the whole of your mind and intelligence.

The raised portions of flesh are called Mounts in Hand analysis. They indicate the activity of various centers of our brain. They are the magnetic centers which deliver the message of the sub-conscious mind in the shape of lines. Each palm is divided into 9 parts known as MOUNTS. Each mount reveals mental as well as physical peculiarities of the individual such as the degree of egoism, extroversion, introversion sympathy, imaginative power, patience and endurance.

The study of the line is capable of explaining the finding out the good traits as well as the traits of various types of criminals. One can also judge with great accuracy the mental sickness and also the sickness due to psychological upset. The major lines are the heart, head, and life lines refer figure 2 and these lines are normally the deepest lines in the hand. They travel through every mount or zone of the hand and form a complete expression of an individual's energy and potential. To analyze the lines it is not just sufficient to concern only the individual lines but the other aspects like length, direction, origin and end position with respect to mounts, branches, islands and etc. should also be considered.
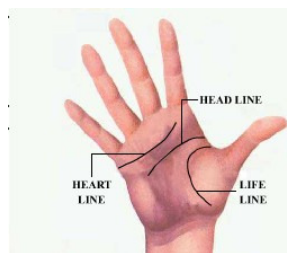
.

FIGURE 2: Major lines of the Hand

The line of heart is capable of tracing the more abstract, the more incomprehensible and the more subtle faculties of the person which ultimately decide the 'character 'and the 'personality'. The line of head is the most important line on the hand, as it indicates the brain power, mental forces and intellectual abilities. This line divides the hand into two parts .The upper parts show the mental development and the lower part shows the material development. The life line usually shows the vitality and energy of the person. The length, the depth and the continuity reveal the quantity of the vitality. This line also has great psychological aspect. The more characteristics that major lines represent can be found in [10, 11, 12, 14, 15, 16 project work chapter 3].

The major line in the palm contributes to the Major characterization of a person. The palm is a mirror of our Brain and mind. Dr Eugene Scheimann has referred to many experiments of his times to prove that the three main lines and the pattern on the skin of the palm are formed during the third and the fourth month of pregnancy [45 project work].

4. BIOMETRIC-III : AS A TOOL IN MEDICAL DIAGNOSIS

Biometrics-III extends the horizon (various precise landmarks) in identifying many health concerns. "Overall health is achieved through a combination of physical, mental and social well being which together commonly referred to as health triangle". [Wiki]The Indian concept of health can be understood from the available sources of the Vedas, Upanishads and Yoga.[Mart hum paper].These literature describes the balanced state of health conditions and any deviations from the balanced condition considered to be problematic. Good health means a perfect balance between the body, mind and soul, which is referred with the concept of 'Triguna'.

Among the four Vedas – Rig, Sama, Yajur, and Atharva, Atharvaveda deals with mental health and illness, i.e., the concept of 'Triguna' : 'vata', 'pitta', and 'kapha' : the motion, the liquid component, and the heat or energy component; as well as mental i.e., 'satva', 'rajas', and 'tamas'.The mental Triguna also contributes to the personality of a person as stated in the earlier section(Biometric II), while Biometrics III is more confined to the Physical Triguna i.e., 'vata', 'pitta', and 'kapha' that signifies health conditions.

Face is the index of mind. Our beauty is a reflection of our health, both physical as well as mental. Listen to your body; it is trying to tell you something! In the early days doctors diagnosed the diseases, by examining the tongue, the eyes, nails, various skin patterns (dermatoglyphics), and hair distribution. In general it is nothing but identifying the diseases through the body symptoms .

The health condition of a person is perceived by the Face and Hands. The Mishio Kushi Theory (Face Reading) contends that a weakness or toxicity in a certain organ or gland can cause acne on certain areas of the body. The radiance on the face represents the credibility of the body health. Similarly Hand interprets the thought impulses of the brain and hence these carvings and also all nerve endings happen to end here.Hence forth the Face and Hand can be made into a continuum of differential areas of face, which in turn represents the health condition of the body. The following sections delineate the role of Face and Hand in Serving as a Tool in Medical Diagnosis.

4.1. Medical assessment on the Basis of the Face Analysis

Face is broadly divided into: The fore head, The mid face, and The lower region, any variaition of health is reflected on any of the above region via acnes, pimples, wrinkles, lines, rashes, redness, and puffiness. Acne and pimples are the body reactions to the clogged pores i.e., toxins often cleanse through the skin, when the other eliminating systems are sluggish; hormonal imbalances over stimulate the oil glands and impurities in the blood will often affect the skin & these leads to clogging of pores.

In Oriental medicine the forehead-represents the nervous system, the gall bladder, liver and stomach. If there is no proper excretion of toxins by the gall bladder and intestine, results in pimples. The mid face-This is the area from the eyebrows to the bottom of the nose. The organs that dominate this region are the heart and the lungs. Kidneys, stomach and liver reflect in areas around the eyes .The lower region -This is the area from the nose down to the chin. It is related to the digestive track. The chin is related to the functioning of the kidneys and gall bladder and reproductive organs. Acne is often thought as a normal part of adolescence. This is not true, acne is merely a symptom that is accentuate by the rapid growth and change within an adolescent's body.

The table represents more clearly the various regions of face relating to internal organs and glands.

Regions of Face	Relating Organs/Glands
Forehead	Intestine
Above eye brows	liver
Between eyes	Spleen
Bridge of nose	Male reproductive
Cheeks	Lungs
Tip of nose or on ears	Heart
Creases at base of nostrils	Brain
Jaw line	Female reproductive
Upper lip	Stomach

TABLE 1: Various regions of face relating to internal organs and glands.

So listen to your body and do not jump to a conclusion and rush to the doctor just with the symptoms .Rather try to study the body changes and act accordingly.The oriental medicine challenges the existing ambiguous concepts, and provides solution.

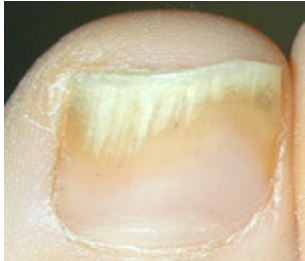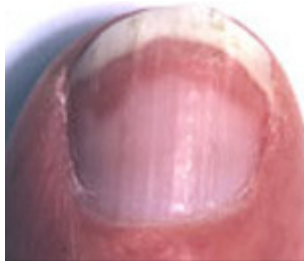## 4.2. Medical Assessment on the basis of the Hand Analysis
Information on the law and practice of hand reading has been found in Vedic scripts, the bible and early writings. Judging by the number of hands painted in prehistoric caves it would seem that palmistry interested humans since the Stone Age. Medical researchers studying skin patterns (dermatoglyphics) have discovered a correspondence between genetic abnormalities and unusual markings in the hand. Research has confirmed a link between specific fingerprint patterns and heart disease. Dermatoglyphics, an area of research which deals with the study of finger prints, and to a lesser extent, palmar creases, in terms of their development and their relationship to some birth defects and genetic conditions.

Supporting this view we have derived the ideas and research made by Martijn van Mensvoort, MSc. (Psychologist from The Netherlands), who has done more than 15 Years of work on Hand Analysis. The subsequent paragraph clusters together on how the different part of the Hand i.e., Nails, Fingers, dermatoglyphics, and Hand lines.

4.2.1 Assessment on the Basis of Nails
From the early 80's various works have been published which describe the clinical relevance of the nails. A classical example in this field is the work presented by Beaven & Brooks: Diagnosis. However, only a few years ago medical students were hardly aware of the clinical value of the nails. In order to fill this gap several dermatologists have combined their knowledge and created in 1997 'Nail-Tutor ': a visual personal computer program including 150 photo's which describe the anatomy and pathology of the nails.

In general one can say that only some diseases are frequently accompanied with nail abnormalities. The following table shows a sample overview of the most well-known diseases with description of the accessory nail abnormalities. More detailed description can be obtained from [30].

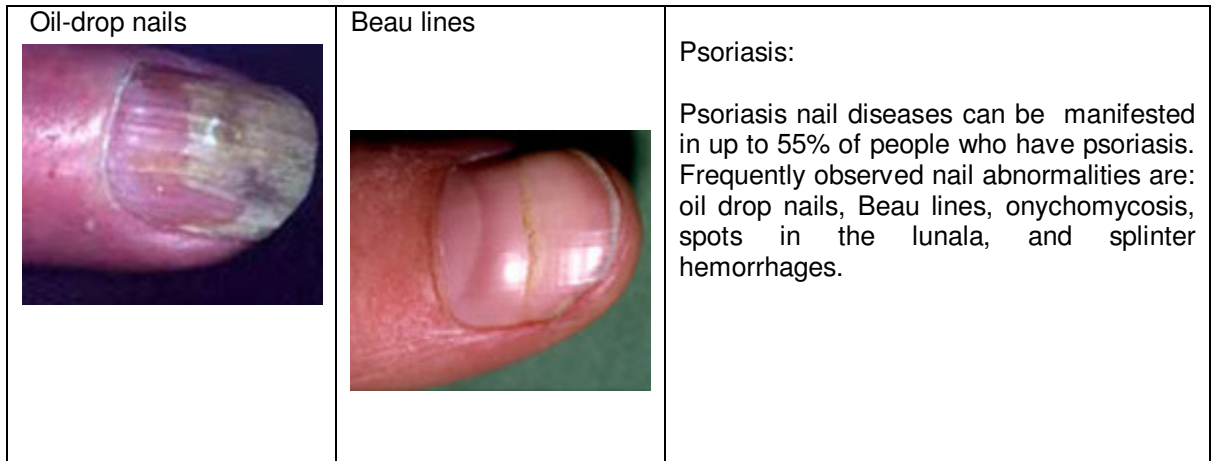| Onychomycosis	Terry's nails	Diabetes
		In a Atlas of Diseases of the Nail it is described that diabetes is relatively frequently accompanied with onychomycosis and 'Terry's nails' (half white, half pink nails).

Oil-drop nails	Beau lines	Psoriasis:
		Psoriasis nail diseases can be manifested in up to 55% of people who have psoriasis. Frequently observed nail abnormalities are: oil drop nails, Beau lines, onychomycosis, spots in the lunala, and splinter hemorrhages.

FIGURE 3: Assessment on the Basis of Nails

4.2.2 Assessment on the Basis of Dermatoglyphics
The famous magazine 'Nature' in 1963 presented an article published by L.S. Penrose who described observations which indicate that Down's syndrome is accompanied by specific characteristics in the dermatoglyphics. Stereotypical features in the dermatoglyphics in Down's syndrome are: Ulnar loops on all fingernails (+ possibly a radial loop on the ring finger), and in palm: a high positioned axial triradius, and a loop between the ring finger and the middle finger. The researchers have discovered that other genetic syndromes are accompanied with dermatoglyphics abnormalities as well. Another relevant factor appears to be the fact that the relative syndromes are usually accompanied with a high frequency of congenital heart disease.

4.2.3 Assessment on the basis of the Fingers
Of late the work of John T. Manning ('Digit Ratio') has reached the media worldwide. Manning discovered that the so-called 'Digit ratio' (the ratio of the index finger length and the ring finger length) might become a useful instrument in the diagnostic perspective of various medical and/or psychological problems.

4.2.4 Assessment on the basis of the Hand Lines
The scientific research has indicated that certain characteristics of the lines can indeed have some medical significance. However, in isolation these features have no value at all: only certain COMBINATIONS of features can provide a solid basis for a medical diagnosis. For instance various studies executed by medical researchers have shown that the so called simian crease is observed in about 60% of people who have Down's syndrome (mongolism).The diagnostic value of the other lines has not been established yet. However, it is premature to conclude from this observation that traditional hand analysts have gathered more insights on this matter. For, these 'alternative' insights have been constructed merely on the basis of anecdotal evidence.

5. CONCLUSION
The above paper provides a platform for future studies on Biometrics system. Although earlier studies have said that Biometrics can be used for verification and identification, we arrived at a conclusion that it has much more. For it can be used to identify the personality as well , as discussed in Biometric-II.These biometrics can also be used to analyze the health condition as discussed in Biometric-III.These levels can be extended depending upon other factors like to study of previous birth to Biometric IV. Some of the novel approaches used in finding the characters using the Hand Analysis confining to three major lines have obtained encouraging results. We hope this humble beginning will lead to a major leap in future for personality identification and for medical assessment of various disease diagnosis .

C.N. Ravi Kumar, P. Girish Chandra & R. Narayana

6. REFERENCES

[1] J.G.Daugman, "High confidence visual recognition of persons by a test of statistical Impedance", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 15(11): 1148-1161, November 1993

[2] Davide Maltoni, Durio Maio, Anil K. Jain , Salil Prabhakar, "Handbook of Fingerprint Recognition", 2002

[3] Ruud M. Bolle, Jonathan H. Connell, Sharath Pankanti, Nalini K. Ratha, Andrew W. Senior, "Guide To Biometrics", 2003 Websites (accessed latest on January 13, 2005.)

[4] [online] http://csc.noctrl.edu

[5] [online] http://www.biometricsinfo.org

[6] [online] http://ctl.ncsc.dni.us/

[7] [online] http://www.gizmo.com.au

[8] [online] http://www.iirme.com

[9] Siddhesh Angle, Reema Bhagtani, Hemali Chheda , Thadomal Shahani , "Biometrics : A Further Echelon Of Security " 1993.

[10] D. Edward D. JD. Campbell, "III BIOMETRIC FUTURES", This is taken from a paper originally developed for Amida Biometrics, L.L.C., in 2002, by Edward D. Campbell, and edited for use on the IBMBS web site ins September, 2003.

[11][Online],http://www.griaulebiometrics.com/page/en-us/book/understanding-biometrics/introduction/authentication-technologies/comparison

[12] Nanavati S, Thieme M, Nanavati,R," Biometrics, Identity Verification in a Networked World, , Wiley Computer Publishing, 2002",[Online] Available: http://www.colby.edu/~jbrosenb/STS%20Project/web/; ,

[13] Lee Siow Mong, "The Chinese Art of Studying the Head, Face and Hands", *Eagle Trading Sdn Bhd, Malaysia,* 1989.

[14] Lad, Vasant, Ayurveda, "The Science of Self Healing", *Lotus Press*, pp 60-62, 1984.

[15] Santa Fe, N.M., Ros, Frank ,"The Lost Secrets of Ayuvedic Acupuncture", Lotus Press, Twin Lakes, WI. 108-112, 1994 .

[16] Ed. Sharles S, " Major Psychological Assessment Instruments", Newmark, 1996.

[17]Simon , "Vedic Astrology The Language of the Gods", Available http://www.soothsayers-india.com/vedic-astrology.

[18] Dr. Dhira Govinda Das , "The Vedic personality Inventory"

[19] Sri aurobindo kapila shastra , "Atharavabveda".

[20] Sri Selvam Siddhar, " Atharva Vedic "Muhasastra" Also known as FACE READING Commander Selvam, Available: http://forums.joeuser.com/366328.

[21] [online] http://www.howtoreadfaces.com/index.html

[22] [online] http://www.astrology.com.au/face/index.asp

[23] [online] http://physiognomyinfo.com/

[24] [online] http://www.dhyansanjivani.org/chin_face_read.asp

[25] "The naked face", Available: www.gladwell.com/2002/2002_08_05_a_face.htm

[26] Face Reading for astrology charts, horoscope reports, compatibility and star signs. Available: www.astrology.com.au/face/theface.asp

[27] The Art of Face Reading Available: www.chiofearth.com/article4.htm

[28] Dr .M.Katakkar, "Encyclopedia of Palm and Palm Reading", *UBSPD,* India, 1992.

[29] Judith Hipskind Collins, A to Z of Palmistry," The Essentials for reading Hands" Dallas, JAICO, 2008

[30]Caslon Analytics,Physiognomy, "Phenotypes ",Available: http:// www. caslon. com. Au physiognomynote4.htm

[31]CaslonAnalytics,Physiognomy,"Phenotypes",Available: http:// www. caslon. com. Au physiognomynote9.htm

[32]CaslonAnalytics,   "Physiognomy:Character   ",   Available: http://www.caslon.com.au/idcrimeguide31.htm#b red Cheiro, Cheiro's Book of Fate and Fortune, America: New Lights

[33]Kenneth A. Lagerstrom, "Introduction to Cheirology", Available: http://www.humanhand.com/intro.html

 [34]Martijn van Mensvoort, "Palm Reading Research - Unique Reports from the Fields of Hand Analysis" , Available: http://www.handresearch.com/research/palm-reading-research.htm

[35]Martijn van Mensvoort," Hand Research: Global News & Science about Hands", Available http://www.handresearch.com

[36]Martijn   van   Mensvoort,   "   Hand   Analysis   Research",   Available http://www.handresearch.com/hand/Evolutie/10jaarEngels.htm

[37]Martijn van Mensvoort, "Discoveries about the Human Hand in the Fields of: Psychology, Psychiatry & Medics", Available http://www.handresearch.com/course/palm-reading-course.htm

[38]Martijn   van   Mensvoort,"   Hand   Analysis: Psychology   ", http://www.handresearch.com/hand/Evolutie/psychoEngels.htm

[39]Martijn   van   Mensvoort,   "Hand   Analysis   Researcher   Overview "http://www.handresearch.com/hand/Evolutie/overzichtEngels.htm

[40] Dr.Narayan Dutt Shrimali, "Practical Palmistry", Judhpur: Pustak Mahal, 1979

[41]Prof.O.P Verma," The principles of Palmistry", Vol-1, India: Ranjan Publications, 2005

[42]Prof.O.P Verma, "The principles of Palmistry", Vol-2, India: Ranjan Publications, 2007

C.N. Ravi Kumar, P. Girish Chandra & R. Narayana

[43][Online] http://www.marysherbs.com/heal/heal-f-rP.htm

[44] [Online] http://www.handresearch.com/medical-hand-analysis.htm

[45] [Online] http://www.handresearch.com/news/hands-on-cancer-hand-palm-cancers.htm

[46] [Online] http://en.wikipedia.org/wiki/Big_Five_personality_traits

[47] Ekaterina Kamenskaya1 , Georgy Kukharev2,"Recognition of Psychological Characteristics from Face".

[48] A Argelander, "The Personal Factor In Judging Human Character", Institute of Brain Research, Berlin, 2006.

[49] [Online] www.howtoreadfaces.com/intro.pdf

[50] [Online] http://www.indusladies.com/forums/