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Conceptual Analysis on Sushruta's view and its utility in Biometrics

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ABSTRACT

In Ayurveda classics *Acharya Sushruta* has said that size of the *Dristhi* and *Romakupa* doesn't change with age. He also mentioned that there are few structural changes in the body which are natural like falling of teeth, absence of hairs on palm and sole. The same concepts of *Dristhi* and absence of hairs on palm are used in the implementation of iris, retina and finger print technology in various sectors and these physical traits helps for security, accuracy and reliability in identification systems such as KYC.

Key words: *Dristhi, Romakupa, Palm, Identification System.*

INTRODUCTION

In Ayurveda classics *Acharya Sushruta* has mentioned that size of the *Dristhi* doesn't change with age and absence of hairs on palm. Implementation of iris and fingerprint technology in various sectors has increased security, accuracy and reliability in identification systems such as KYC.

Biometrics is the science and technology of measuring and analyzing biological data. This technique can be easily acquired and measured for processing only in the presence of a person. These characteristics and behavior are used to recognize - Access Control, Time and Attendance Management, Surveillance.

The biometric systems are to overcome the

drawbacks of the traditional computer based security systems. The systems had proved to be accurate and very effective in various applications. It is quite sure that in future biometric based recognition will have a great influence on our daily routine and business.

MATERIAL AND METHODS

This is conceptual type of paper or article, textual material are used for the study from which various references have been collected, Ayurvedic texts used in this study is *Sushruta Samhita* available commentaries on it, Literature survey of modern text are also used. Research article available on internet also studied.

REVIEW OF LITERATURE

Sushruta practiced and taught medicine around 600BC. He is famous as a disciple of *Dhanwantari*, who is known as Lord Deity of Ayurveda, the Indian system of medicine. In one of his chapters of *Shareera Sthana* he has mentioned that,

द्रिश्चि रोमकुपश्च न वर्धन्ते कदाचने ।

ध्रुवाण्येतानि मर्त्यानामिति धन्वन्तरेर्मतम् ॥ (सु.शा 4/59)^[1]

Dristhi here refers to sight, pupil and Retina, *Romakupa* refers to hair follicles. Both these structures do not grow or change with the age, they

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remain the same throughout the life. Iris an integral organ, it has a fine texture determined randomly during embryonic gestation at 10th week. The iris is mostly flat and its geometric configuration is only controlled by two muscles that control the diameter of the pupil. It is well protected against damage and wear by a highly transparent and sensitive membrane.

सन्निवेशः शरीराणां दन्तानां पतनोद्भवौ ।

तलेष्वसम्भवो यश्च रोम्णामेतत् स्वभावतः ।।(सु.शा 2/58)^[2]

In this world every person or a creature has its own physical traits among them few are natural like falling of teeth and absence of hairs on palm and sole.

Dermatoglyphics is study of ridge patterns in the skin. It appears between 12-16 week of IUL and formation is completed by 24 weeks. At birth a fine pattern of ridges is seen on the skin of bulbs of the finger and thumbs, part of the palm and soles of the foot. The finger prints are capable of endless variation, so that it has speculated that there is one chance in 64 billions of 2 persons having identical fingerprints. It is important in case of MLC, in criminal impression of all the ten fingers are taken but for civil purposes, the left thumb impression is only taken.

Retina Scanning

The human retina is a thin tissue composed of neural cells that is located in the posterior portion of the eye. Because of the complex structure of the capillaries that supply the retina with blood, each person's retina is unique.

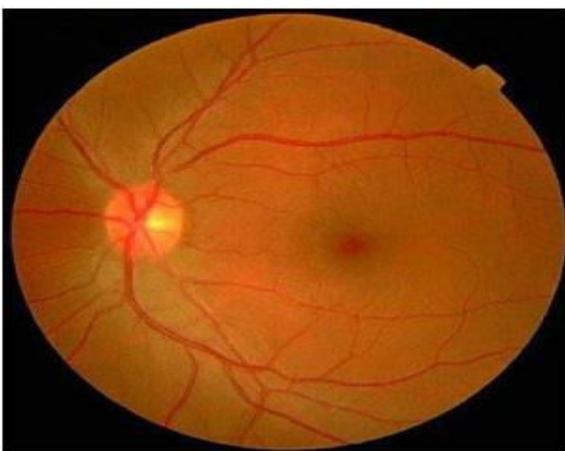


Figure 1: Retinal Scan

The network of blood vessels in the retina is so complex that even identical twins do not share a similar pattern. Although retinal patterns may be altered in cases of diabetes, glaucoma or retinal degenerative disorders, the retina typically remains unchanged from birth until death.

Finger Print Scanning

Fingerprint is by far the most recognizable biometric modality around the world. The uniqueness of this modality is determined by mapping the ridges and furrows of a finger. This modality is practical and convenient to identify end users and the first commercially widespread biometric hardware which is why it is mostly used in law enforcement, forensic departments, government projects, banking, and workforce management.

Examples of current fingerprint deployments include:

1. Fingerprints captured for voter registration in Nigeria
2. Iraq implemented a biometric fingerprint system for border patrol security

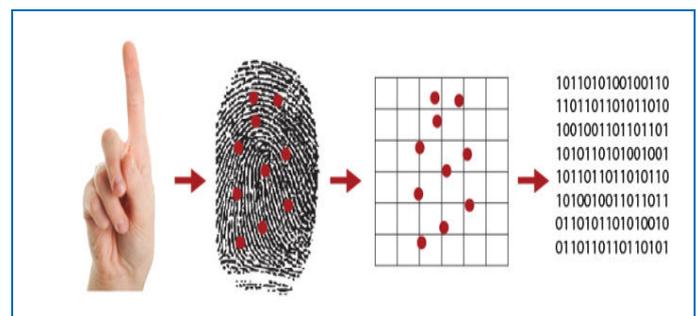


Figure 2: Finger Print Scan

Specific characteristics unique to every persons fingerprint are filtered and saved from the raw images as an encrypted biometric key or mathematical representation.

DISCUSSION

According to modern science different anatomical structures are used as modalities of biometrics like voice recognition, finger vein, facial, palm vein, fingerprint and iris. Among all these modalities most

used is fingerprint and retina recognition other are used less as compared to these.

In our classics Acharya Sushruta have highlighted both the concepts of retina and fingerprint by saying that doesn't change with age and are natural respectively same concepts are used for the identification of an individual.

CONCLUSION

As per the *Sloka* mentioned in the Ayurvedic texts of *Sushruta Samhita* clears that why the retina and fingerprint techniques are used as modalities for the recognition of a person. It is clear that every biometric modality has its own benefits and drawbacks. Fingerprint is the most popular, used in many sectors like college, banks, companies etc. Retina recognition is less compared to it. But among all other structural

modalities these are used most. As per *Sushruta* concept also these two modalities can be a better modality for biometrics.

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