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LITERATUR REVIEW : FINGERPRINT TECHNOLOGY AS THE NEW WAY PERSONALITY DETECTOR

Abstract

Fingerprint is a form of biometrics, which uses the physical characteristics of the population to identify and verify personality (Santi, 2008). Fingerprints technology early found in 1901 by E. Henry. He used the fingerprint method to identify workers in order to address dual pay (Nugroho, 2009). Fingerprint pattern has been identified can digital technology function to find out a person's personality because the shape of a person's fingerprint pattern is not the same one with another and and will not change during life (Dian, 2012). In general fingerprint patterns have several forms, namely: Arch (Arcus), Loop (sine), and Whorl (vortex) (Putra, Putra and Bayupati, 2014). The purpose of this literature review is to know personality types According to Fingerprint Patterns such as; Whorl Patterns, show tend to be honest, christian, perfectionist, competitive, communicative, and strong-willed personality. Loop Pattern tend to be serious person and have high visual memory. Arch Pattern tend to hold traditional values and high morals, high ambitions in careers, and strong leadership personality. Using the literature review technique, the results show that one of the characteristics of fingerprint patterns can be recognized through the patterns of similarity, although not the same fingerprints between individuals. Each fingerprint pattern in addition reflects the personality type.

Keywords: *fingerprints, biometric, E Henry, personality, digital technology.*

INTRODUCTION

At present many countries in the world are developing technology that is able to identify individuals from the biological characteristics of individuals known as Biometrics. According to Santi (2008), Biometrics itself is a way to identify and verify individuals based on their physical characteristics or behavior. Some types that have been successfully developed

include fingerprints, retina, facial structure, voice, hands, and others. On this basis, experts, especially in the field of dermatoglyphics, continue to develop intelligence and aptitude tests. As a result, in 1965 a technology called the fingerprint test was discovered. Because of its development through dermatologlyphic science which is based on Howard Gardner's multiple intelligence. According to Suryadi (2010), this technology is able to trace one's talent and intelligence with an accuracy rate of 95%.

The technology used in fingerprint machines is Biometric technology. Biometrics or biometrics comes from the words bio and metrics. Bio means something that is alive and metrics means to measure. Biometrics means measuring the distinguishing characteristics of a person's body or behavior that is used to automatically recognize the person's identity by comparing them to characteristics that have previously been stored in a database. The definition of "automatic recognition" in the above definition of biometrics is the use of technology (computers) (Gandhi, 2017).

LITERATURE REVIEW

Fingerprint Technology

According to Dian (2012), a fingerprint pattern that has been identified can function to find out a person's personality because the shape of a person's fingerprint pattern is not the same and will not change during life. Meanwhile, according to Putra (2014), Based on dermatoglyphics theory through the process of fingerprint analysis is more efficient in understanding one's personality. In general, fingerprint patterns have several forms, namely: Arch (arcus), Loop (sine), Whorl (vortex).

A person's personality can be identified by analysis of fingerprint patterns based on dermatoglyphics theory. According to Misbach (2010), fingerprint patterns are closely related to the function and work system of the brain, where the work system of the brain reflects a person's personality, talents and intelligence. Human fingerprints are not the same and are grouped in 3 types namely arch, loop and whorls, while the other patterns are variations of patterns that arise with reference to the three basic patterns of the fingerprint (Pollock, 1971).

Gartner (in Misbach 2010) put forward the theory of multiple intelligence, there are eight brain abilities related to intelligence, personality and talent. In general, personality identification is done using a psychometric test that goes through a series of relatively long and long stages. Through fingerprint pattern analysis, it is a more efficient approach to understanding one's personality and talents based on theory dermatoglyphics. Based on the

research of Bhuyan et.al (2010), using fingerprint classification with hierarchical agglomerative clustering technique with the FPROCK method that classifies images with the neighboring concept of each object, can only identify 6 classes with an accuracy rate of 97.3%.

Minarni (2010) examined the fingerprint classification by feature extraction method with wavelet transformation and fingerprint classification using the Learning Vector Quantizations (LVQ) algorithm, capable of producing 85% accuracy in 5 classes of fingerprint patterns. Based on these studies, the authors use the Fuzzy LVQ algorithm and Fuzzy Backpropagation to determine the performance of the classification process of 11 fingerprint patterns.

The author uses the Fuzzy LVQ method because this classification method has the advantage of faster computational time and a better recognition rate than other probabilistic neural networks. But Fuzzy LVQ requires the availability of all training data components and cannot start the training process if the training data is not yet completely available. While Fuzzy Back propagation, in the learning process uses a multilayer neural network that allows a detailed learning process, the ability to use non-linear (irregular) data models and high fault tolerance, which can solve problems that are quite complicated and contain uncertainty. But this method requires training epoh that is high enough to reach the specified training error target.

The process of fingerprint pattern classification using Fuzzy LVQ algorithm is compared with Fuzzy Backpropagation, and how the performance of fingerprint pattern classification on Fuzzy Backpropagation is compared with Fuzzy LVQ. Classification stage is done in two stages, namely through fingerprint acquisition, feature extraction, training process, and pre-classification. Furthermore, the classification stage, through the classification of the fingerprint feature of the test using both methods, is then compared with the Fuzzy LVQ classification method, with Fuzzy Backpropagation. Personality was identified through classification results using dermatoglyphics knowledge base.

Eko (2009) explained that Fingerprint is a form of biometrics which is a new technology that has the main function to recognize humans through fingerprints, eyes, face, or other body parts. Fingerprint comes from English which means fingerprint. Fingerprints are lines on the skin of the fingertips. Fingerprint serves to provide greater friction so that fingers can hold objects more tightly.

Amrut A. Mahajan et.al (2011) examined the relationship between quantitative parameters of dermatoglyphics, namely the number of fingerprint a-b ridges, and the angle of ATD to

diagnose patients with bronchial asthma. A high number of a-b ridge lines can be used as a diagnostic criterion for patients with bronchial asthma.

Shitala Prasad et.al (2011) predicts a person's personality by analyzing handwriting in digital form by using six features namely letter size, slope of letters and words, word base, word stress, spaces between letters and words. The experiment was carried out in two stages, namely the first stage (A) using 2/3 of the sample data as training data and 1/3 of the data as test data. This stage uses 100 respondents, where 2/3 of the handwritten sample data and psychology results are used to train the system and 1/3 of the handwritten sample data is tested to determine its accuracy, 90.3% accuracy results are obtained. The second stage (B) uses one data as test data and the remaining sample data is used to train the system, 93.86% accuracy is obtained.

Cesarik et.al (1996) analyzed fingerprint patterns to identify the level of intelligence with the ridge count parameter (number of fingerprint strokes), number of ridges between triradius A, B, C, D on the palm and the ATD angle of the left hand with the hand right. The sample used was 70 people who have high IQ (superior intelligence) and 400 people who have moderate or ordinary intelligence. The method used is the statistical method of variance analysis and the discriminant analysis of the conclusions obtained is the level of intelligence increases with the increase in ridge count (fingerprint stroke) and decreasing the ATD angle of the palm.

Bhuyan et.al (2010) examined the fingerprint classification method designed with the hierarchical agglomerative clustering technique with the FPROCK method which classifies images with the concept of neighborhood of each object. Classification technique performance is measured by False Acceptance Rate and the accuracy of datasets of various size variations. The FPROCK technique can identify 6 classes at an accuracy rate of 97.3%. While other classification techniques can classify only 5 classes with an accuracy of 80% to 94.8%.

Minarni (2010) examined the classification of fingerprints with the feature extraction method by wavelet transformation and reducing the dimensions of the fingerprint input image. Introduction and classification with artificial neural networks Learning Vector Quantizations (LVQ) classifies fingerprints into one of the main fingerprint patterns (whorl, left loop, right loop, arch, and tenth arch). As a basis for neural network input, images of 16 x 16, 32 x 32 and 64 x 64 are used, and the effect of the size of the input vector dimension on introduction performance is analyzed. The results showed that the performance of introduction increased significantly for inputs with larger dimensions (64 x 64) compared to smaller inputs (32 x 32

and 16 x 16). From the test it can be seen that the reduction in the initial training rate of 0.1 provides the best performance (85%).

Fingerprint is one of the unique ways of identification, because until now there has not been found any similarity in fingerprint patterns between one person and another person so that fingerprints can be used as a tool to identify the validity of a person. Fingerprint is a form of groove on the tip of the finger of a human palm in the form of certain patterns. Two fingerprints originating from a source will have the same local line. No two individuals have an identical fingerprint pattern even though they originate from one ovary. This is because fingerprint patterns that are shaped in an embryo are never passed down. If someone's finger has a wound such as a scratch or tear then after healing, the scratched fingerprint will return to normal. A person's fingerprints will not change throughout their lives unless they have a serious accident or if someone has died two years ago and the decomposition process has taken place.

Fingerprints are genetic structures that are very detailed in the form of skeletons and signs attached to humans that cannot be removed or changed. Fingerprint research has been done since the past. This research developed into a discipline called dermatoglyphics, which is the study of skin suits (fingerprints) on the palms and soles. dermatoglyphics comes from the word "derm" means skin and "glyph" means carving (Misbach, 2010).

Misbach (2010), classifies the characteristics of a fingerprint as follows:

a. Fingerprints are specific to each person. There is no fingerprint pattern that is the same between one individual and another individual even in identical twins. The possibility of the same fingerprint is 1: 64,000,000,000 so it is impossible to find the same fingerprint pattern. And the fingerprint pattern of each finger is different between the thumb, index finger, middle finger, ring finger and little finger.

b. Fingerprints are permanent, they cannot change throughout life. Since he was born until adulthood until the end of his life. Fingerprints will not change even if someone changes from thin to fat.

c. Fingerprint patterns are easy to classify even though fingerprints are specific and the shape is not random.

The figure who pioneered the use of fingerprints was Sir Richard Edward Hendri, thanks to his efforts to classify fingerprint patterns so that the forensic team can now reveal criminal acts or reveal someone's identity. The simplest way to identify fingerprints is by dusting using this method if the suspect's fingerprints are visible to the naked eye or can be called

visible fingerprints. The most recent method commonly used to reveal fingerprints is the Micro X-ray flurescence technique, which was developed by Christopher Worley, a scientist from the University of California who works at Los Alamos National Laboratory. The MXRF method can identify fingerprints that cannot be identified by other methods. Until now fingerprints have also been used for attendance at both private and public companies (Badiatul, 2009).

Personality

Cowen (2012), Personality is defined as enduring and pervasive motivations, emotions, attitudes and traits possessed by an individual. It is a deeply ingrained pattern of behavior in a person. It includes modes of perception related to oneself and the surrounding environment (Causal, 2011). According to Cramer (2002) Personality traits are normal, prominent aspects of personality. Personality disorders results when these personality traits become abnormal and maladaptive. This consequently causes significant social and occupational impairments. Such disorders can lead to excess subjective distress which is difficult to cope with (Azhagiri, 2018).

Clinicians have generally derived these types of personalities:

  • Solitary and self-conscious type

  • Sociable and outgoing type

  • Anxious and timid type

According Radhika (2016), However, psychologists have adopted a more rigorous scientific approach using personality traits such as anxiety, energy, orderliness and self-reliance. There are many theories which explain the development and function of personality (Sandhu, 2017). Mainly, there are five different types of personality traits. They are as follows:

  • Extroversion – highly interactive, enthusiastic, action oriented and talkative

  • Agreeableness – helpful, generous, kind and willing to compromise their interests with others

  • Conscientiousness – disciplined and dutiful

  • Neuroticism – emotionally unstable with tendency to have anger, fear and anxiety

  • Openness to Experience – intellectually curious, creative, sensitive to beauty and open to emotions.

METHOD

The method used in this research is literature study, which is one of the research methods that prioritizes library research, such as books or journals about fingerprint tests and personalities. Researchers also conduct literature studies on research journals that have already existed to answer research questions.

DISCUSSION

Fingerprint technology as the way personality detector

In general, fingerprint patterns can be expressed in three forms, namely: Arch, Loop and Whorl (Rozikin 2014).
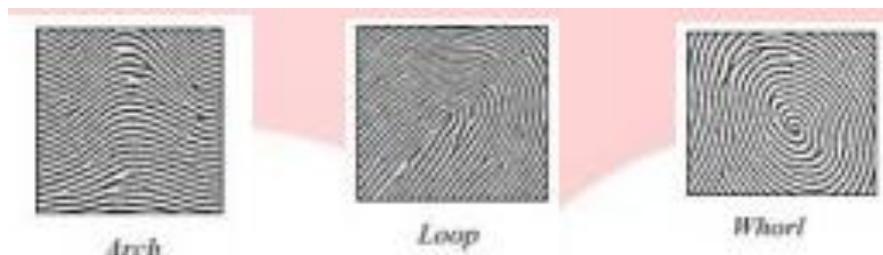
Arch   Loop   Whorl

One of the characteristics of fingerprint patterns can be recognized through the patterns of similarity, although not the same fingerprints between individuals. Rozikin (2014) mentions the classification of the pattern more fully about the discussion of fingerprint pathway patterns that can be studied:

1. Arch type. Basically, arch people are people who base their thoughts on belief systems, normative values and habits that have been formed for a long time in themselves. It is very easy to absorb information that has been planted early on. Through the behavioral habits he goes through, he is very oriented towards the system procedure (at least, which he follows). With systematic thinking like this, the arch type is the type that has a very strong opinion. That was due to the basic pattern of his belief.

2. Loop type. Basically, arch people are people who base their thoughts on belief systems, normative values and habits that have been formed for a long time in themselves. It is very easy to absorb information that has been planted early on. Through the behavioral habits he goes through, he is very oriented towards the system procedure (at least, which he follows). With systematic thinking like this, the arch type is the type that has a very strong opinion. That was due to the basic pattern of his belief.

3. Whorl type with a variety of composite, spiral, and press whorl types, are people who base their thinking on high rationality thinking that has integrated all aspects of both beliefs,

feelings / emotional, and goal initiatives within the framework of fulfilling a more dominant self-actuality.

Personality Types According to Fingerprint Patterns Each fingerprint pattern in addition to reflecting learning styles, also reflects his personality type. The following is an explanation of how to recognize a child's personality with a fingerprint test or analysis of fingerprint patterns:

1. Whorl Fingerprint Patterns Whorl patterned fingerprints show tend to be honest, christian, perfectionist, competitive, communicative, and strong-willed.

2. Fingerprint Loop Pattern Fingerprint patterned loops tend to be serious and have high visual memory.

3. Arch Fingerprint Pattern Arch-shaped fingerprint patterns tend to hold traditional values and high morals, in other words they will continue to hold traditional views about their own ambitions, careers, and leadership.

One of the characteristics of fingerprint patterns can be recognized through the patterns of similarity, although not the same fingerprints between individuals. Each fingerprint pattern in addition reflects the personality type.

CONCLUSION

Fingerprints can reveal a whole lot of things about a person, like their intelligence, personality and talents, to name a few. Dermatoglyphics is a branch of science that is dedicated to the study of the mount, the ridges, and the lines that form your fingerprints. And even though many scientists might have written it off, dermatoglyphics has many believers and is also widely used in palmistry. Generally there are 3 different types of patterns in fingerprints that have a few personality traits associated with them.

The fingerprint scanner personality test uncover the truth about your nature — including strengths, weaknesses, preferences, and even potential. Palm Reading is the divination method to see your characteristics, talents, health and fortunes by observing your palm shape and hand's lines. Basic finger prints patterns Arch, Loop, Whorl The major Minutia features of fingerprint ridges are: ridge ending, bifurcation, and short ridge (or dot). The ridge ending is the point at which a ridge terminates. Bifurcations are points at which a single ridge splits into two ridges.

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Reference :

Amrut A. Mahajan, K. K. Gour. 2011. Dermatoglyphic Patterns in Patients of Bronchial Asthma- A Quantitative Study, International Journal of Biological & Medical Research, Bhopal India.

Azhagiri R., et al. 2018. "Analysis of left thumb print pattern among different human blood groups". International Journal of Anatomical Variations 11.3 (2018): 103-106.

Badiatul M, A. 2009. 105 tokoh penemu dan perintis dunia. Yogyakarta: Narasi, h. 236

Bhuyan, M. H., Bhattacharyya, D. K. 2010. An Effective Fingerprint Classification and Search Method. International Arab Journal of e-Technology, Vol. 1, No. 3, January.

Cesarik, M., Bozicevic, D., Milicic, J, V., Ivekovic, R. Pavicevic. 1996. Quantitative Dermatoglyphics Analysis in Persons With Superior Intelligence.

Cowen P., et al. 2012. "Shorter Oxford Textbook of Psychiatry". 6th edition. Oxford University Press: 130.

Cramer K,M., Imaike, E. 2002. "Personality, blood type, and the five-factor model. Personality and individual differences". APA PsycNet 32.4: 621-626.

Dian, E. S. 2012. Analis, "Mengenali Perilaku Dan Kepribadian Manusia Berdasarkan Pola Sidik Jari Menggunakan Jaringan Syaraf Tiruan," *Jurnal* Informatika, vol. 6, p. 1.

Gandhi, M. A. 2017. Penerapan absensi fingerprint dalam mendisiplinkan kerja pegawai di SMK SMTI Bandar Lampung (Skripsi Manajemen pendidikan Islam IAIN Raden Intan Bandar Lampung), h. 19

Nugroho, E. 2009. Biometrika, Mengenal Sistem Identifikasi Masa Depan. Yogyakarta: ANDI.

Kaushal, N., Kaushal, P. 2011. "Human identification and fingerprints: A Review". Journal of Biometrics and Biostatistics 2: 123.

Kusumadewi, S., Fuzzy, B. 2006. Propagation untuk Klasifikasi Pola (Studi Kasus: Klasifikasi Kualitas Produk), SNATI.

Nugroho, E. 2009. *Biometrika, Mengenal Sistem Identifikasi Masa Depan*. Yogyakarta: Andi.

Minarni. 2010. Klasifikasi Sidik Jari dengan Pemrosesan Awal Transformasi Wavelet. Dikutip dari : https://www.electro.undip.ac.id/transmisi/desember04.htm.

Misbach, I. H. 2010. Dahsyatnya Sidik Jari, Menguak Bakat dan Potensi untuk Merancang Masa Depan Melalui Fingerprint Analysis, Tim Psikobiometric Research Jakarta: Visimedia.

Pollock, W.C. 1971. Character Analysis From Fingerprint and Hands, New York: Press Inc.

Putra, I. G. S. E., Putra, I. K. G. D., Bayupati, I. P. A. 2014. "Pengenalan Kepribadian Seseorang Berdasarkan Sidik Jari," *Jurnal Psikologi dan Kepribadian*, vol. 13.

Radhika, T., et al. 2016. "Tongue prints: A novel biometric and potential forensic tool". Journal of Forensic and Legal Medicine 8.3: 117-119.

Rozikin, K., Purwantini, K. 2014. "Pengaruh Sistem Presensi dengan Deteksi Sidik Jari dan," *Seminar Nasional Teknologi Informasi & Komunikasi Terapan* 2014, 15 November 2014.

Sandhu H., et al. 2017. "Frequency and correlation of lip prints, fingerprints and ABO blood groups in population of Sriganganagar District, Rajasthan". Acta Medica Academica 46.2: 105-115.

Santi, R. C. N. 2008. "Identifikasi Biometrik Sidik Jari dengan Metode Fraktal," jurnal teknologi informasi. Dinamik, vol. XIII, no. 1, pp. 68-72.

Shitala, P., Singh, V. K., Sapre, A. 2010. Handwriting Analysis based on Segmentation Method for Prediction of Human Personality using Support Vector Machine, International Journal of Computer Applications Volume 8 No.12. Allahabad India: October

Soleymani, B, M., Shouraki, B., Kasaei, S, S. (2006) A novel fuzzy classifier using fuzzy LVQ to recognize online Persian handwriting, in: Second IEEE Conference on Information and Communication Technology (ICTTA).

Suyadi. 2010. Rahasia Sidik Jari, Cara Mudah Mendeteksi Bakat dan Kecerdasan Anak dengan Sidik Jari, Flash Book. Jakarta.