

# Identification of Student characteristics using Dermatoglyphics for enhancement of their learning techniques.

Sheik Imran <sup>1</sup>, Chandan V. <sup>2</sup>, Arpitha S. P <sup>3</sup>, Prerana. V. Patil<sup>4</sup>.

<sup>1,2</sup> Assistant Professor, Dept. of Information Science and Engineering, BIET, Davangere, Karnataka, India,

<sup>3,4</sup> UG student, Dept. of Information Science and Engineering, BIET, Davangere, Karnataka, India.

**Abstract** - Dermatoglyphics is a study of configurations of epidermal ridges on certain body parts, namely, palms, fingers, soles, and toes. The word Dermatoglyphics comes from two Greek words derma means skin and glyphs mean curve and it refers to the ridge formation which appears on palms of hands and soles of feet. Fingerprints of both hands are not the same and persist lifelong unless dermis is damaged. During development, various creases develop on the brain and are reflected on fingerprints representing various regions of the brain and are commonly being used in dermatoglyphics mental intelligence test. Analyzing student's fingerprints at an early age to understand their innate characters and learning potential in terms of education and providing suitable learning techniques to make them easy and learn to the fullest.

**Key Words:** Dermatoglyphics, whorls, loops, arches.

## 1. INTRODUCTION

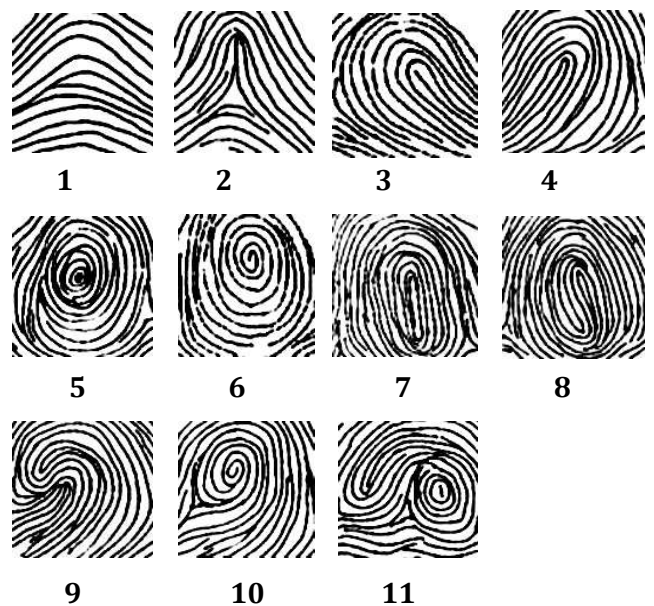
A fingerprint is an impression or mark made on a surface by a person's fingertips, able to be used for identifying individuals from the unique pattern of lines on the fingertips. The term is derived from ancient Greek: derma = skin, glyph = carving. Dermatoglyphic patterns begin to develop in the 10th week of gestation and are complete by the 24th week. The fingerprints are unique to everyone even the identical twins often share personality, interests and habits, they won't have identical fingerprints even monozygotic twins show different fingerprints. The fingerprints are mainly of 3 patterns are: loops, whorls, arch which consists of many subtypes, as shown in fig 1.1.



Fig. 1.1: Three main fingerprint patterns

Testing on these fingerprints reveal intrinsic qualities and talents, learning experiences and identify learning style, reveal hidden talents and makes choosing of career easier. The fingerprint is the skin on human fingertips contains ridges and valleys which together form distinctive patterns. Fingerprint remains the same throughout the lifetime. Injuries like cuts, burns can temporarily damage the quality of fingerprints but when fully healed patterns will be restored. Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar:

### 1.1 Different patterns of fingerprints



1. **Simple Arch Patterns:** hill-shaped, curved top, no triangle was formed in with the shape.
2. **Tented Arch Patterns:** like a camping tent with a sharp tip top.
3. **Ulnar Loop Patterns:** like a waterfall flowing towards the little finger with triangular points.
4. **Radial Loop Patterns:** The opposite of ulnar loop, the "waterfall" flows toward the thumb.
5. **Concentric Whorl Patterns:** Lines starting from the center of the small circle, the lines on fingertip appear to be a complete circle and spread out like concentric circles with two triangular points.

6. **Spiral Whorl Patterns:** A spiral pattern starting from the center and move outward, has two triangular points.
7. **Press Whorl Patterns:** Similar to the whorl pattern, but the circle turns into a long oval shape, has two triangular points.
8. **Imploding whorl Pattern:** Tai Chi-like patterns in the middle, surrounded by multi-layers of a circle.
9. **Composite Whorl Patterns:** Tai Chi-like pattern without multi-layers or circle surrounding it.
10. **Peacock's Eye Patterns:** From the center, it looks like a peacock's eyes and lips; the center consists of more than one circle or spiral, the end of each ring is connected in a straight line. It has two triangular points; one further and the other closer to the center.
11. **Variant Patterns:** Often has a combination of two or more of whorls, ulnar loops, or simple arches, with two or more triangle points.

## 2. COMBINATION OF PATTERNS

It is a matter of immense concern that what combination of patterns does an individual carry, as his/her blueprint to behavior. If the whorl patterns are denoted by O, and arches are represented by W, due to the circular and wavy nature of the patterns, respectively. Although there can be 35 combinations of fingerprint patterns, loosely based upon all whorls categorized as one, both loops as a single category and both arch and tented arch patterns grouped into one category of arches, assuming that patterns under single category correspond to more or less similar kind of behavior among humans.

**1. Shape: OOOOO (all whorls):** A person having whorls in all his/her fingers is confident in nature. Such an individual has a strong character and an influential personality. But it has been observed that they have high temperament. It can be very well concluded from such observation that with time and coming opportunities, this person has the potential to mend his life and fate dramatically. Although, it can be suggested that, incurring patience and calmness in his attitude shall prove beneficial.

**2. Shape: WWWW (all waves):** Considering the fact that each pattern design is related to neocortical fold makeup and neural circuitry, an individual possessing such a combination is straightforward in social interactions. He/she is most likely, to be honest in his pursuit. Although, they have been observed to be very sensitive towards arts and crafts that include creation. This suggests that such people should pursue such passion and knack for fine arts as a career. They are quite introvert and shy in nature. They find it tough to mingle easily with others, rarely expressing themselves. They also are unable to conduct

tasks that involve the supervision and management of the team under their leadership.

**3. Shape: OWWWO:** Individuals having such a combination of prints on their fingers succeed in their professional life. They tend to get into jobs that are highly valued for and well-acknowledged. However, they should be careful to not get into any kind of hustle because they tend to take things for granted. They tend to keep an air around themselves which may offend colleagues. They easily attract jealousy from people and their pride may let them get betrayed. People of such nature are counseled to treat their counterparts with respect. They must avoid getting into petty issues.

**4. Shape: OWWOW:** People with this combination of fingerprint patterns need to put lots of effort into their professional matters. They are observed to get recognition for their hard work at the prime of their ages. They certainly will have struggling initial years into their jobs. But they must keep patience because they gain wealth with age.

**5. Shape: OWOWW:** These people tend to easily get judgmental about others. As a result, they can find it hard to accept others as they are and perceive things in a narrow-minded way. They must learn to be humble and generous. This negative attitude can interfere in the way of holistic well-being of their personal as well as professional lives. It will also mean being considerate to others which will indirectly help them to scale the ladder of success, especially if they are involved in executive and administrative careers.

**6. Shape: WOOOO:** A person having arches on his/her thumb and remaining all whorls is a very sharp and clear-headed person. They can attain success in life only when they work towards the aim, rather than leaving it all upon fate. They have the respect of their associates who will support his/her pursuits. It may be because of the fact that a person having such fingerprint patterns is a kind, compassionate humanitarian being.

**7. Shape: OOOOW:** People with such a sequence of fingerprint patterns are very soft-hearted. They easily get attached to the elderly. They are kind and caring. Hence, they prove good associates to old aged people. However, they have trouble trusting people easily which may come in between their paths of success. Still, they have been found to make a decent, well-acknowledged living for them. They need to get out of their shell and be a little less conservative.

**8. Shape: OOOWW:** Individuals with such pattern sequences need to be cautious of their behavior of jumping to conclusions too early. They also need to

control their temperament and check that they do not easily lose temper. This behavior might land them up in trouble. This is the only challenge they face towards making big of themselves. They are of high potential and must channelize their energy tactfully, by approaching a situation in a calm manner.

**9. Shape: OWWW:** Subjects with whorl only on thumb and arches on remaining all fingers are of good and firm character. They need to put a huge effort into their professional growth. However, they are suggested to keep patience as their efforts will turn into success only after a certain age.

**10. Shape: WOWWW:** These individuals have one special characteristic. They are quite remarkable at social skills. They do not hesitate about taking risks in situations that involve their career. They are confident by themselves and face challenges knowingly. However, not every situation is as yielding as the fortunate ones. Hence, it is advised to such subjects that they try taking lesser risks as they mature in life. They should consider options that are more stable

**11. Shape: WWOWW:** People having this kind of pattern sequence are little different than their same-age counterparts. For them, life holds deeper meanings and greater visions. Such people are great visionary but can often lose grip on reality. They are not much of practical and hence may invite trouble for themselves, leading a dreamy life. They need to realize that this great potential that they have been endowed with, also hands them great responsibility towards others.

**12. Shape: WWWOW:** People having arches on all four fingers except on ring finger which has a whorl is a huge success in academic fields. Usually, they are of high intellect and easily make themselves renowned as scholars. They lead a smooth decent living and earn a moderately handsome amount of wealth. They have the potential to hugely succeed from their academic intellect.

**13. Shape: WWWWO:** These people have the stars to inherit property from some senior members of his/her family or closed acquaintances. They too can make profitable careers for themselves and succeed in life. However, their only stone in the path is their impatient nature. This might lead them into many unwanted hustles both in professional and personal lives. They need to train themselves to be a little less impatient with people and situations around themselves so that they can obtain better results.

**14. Shape: OOWWW:** Such people are arrogant and proud. They may appear tough outside, dealing with people around them. To understand them deeply needs great

patience and perseverance. It has been observed that deep inside, they are kind-hearted beings. They do not find it easy to mingle with other people and they need to put the effort in that direction. Also, this snob nature may land them up in some trouble as their relatives may make the most of this particular weakness of theirs.

**15. Shape: WOWWO:** Such individuals are very responsible and thoughtful about their own lives from a young age. They know what they want to do further in their lives. On average, they lead peaceful contented lives. They are deep thinkers and do not take anything very lightly.

**16. Shape: WOWOO:** People with this combination of fingerprint patterns are very outgoing and extrovert in nature. They have high interpersonal intelligence and are much carefree when it comes to enjoying life with same-aged people. As they reach the prime of their ages, they crave for emotional dependency on others as their whole emotional makeup is based upon people from a very young age. They need to make a stable career for themselves so that they need not get vulnerable at a very old age.

**17. Shape: WOWOW:** They usually are rebellious in nature, when it comes to ideology or thought on how to pursue something. They go the way which is most unconventional. Also, they are obstinate in nature and very hard to talk into something. However, their high confidence in themselves, coupled with a good amount of confidence. Although, it is a matter of bigger concern that things such a person want from life, mostly turn out to be vague and abstract.

**18. Shape: WWOWO:** Such an individual needs to be much patient with his life because it has been observed that he/she shall have alternate events of success and failures in life. Although, it can be overcome by using more of other abilities with steadiness and patience. This will pay off and the person matures enough to handle issues tactfully.

**19. Shape: WWWOO:** This combination of fingerprint patterns appearing in the mentioned sequence represents a very kind-hearted, compassionate person. He/she has above average interpersonal intelligence and is jovial around people. They must get into a business that includes marketing, counseling, PR etc. because they are one of the few having charismatic personalities. They need to focus and work towards their aim in life. This will reap them huge success.

**20. Shape: OWWOO:** Another class of print patterns is the above-mentioned one. People having this combination reach the summit of a career in the mid of

their lives. However, they need to work hard during the initial years to enjoy the perks later in life.

**21. Shape: WWOOW:** The people having this combination of patterns lack the ability to judge correctly without bias or prejudice. They are very potential but do not have the ability to focus on the goal for long. This is the only weakness they have. They need to have self-control on whatever they want to pursue in life.

**22. Shape: OWOOW:** Having a character that is commendable, these people are very popular among counterparts because they have this innate quality and will to help everyone out there. They are caring in nature. They are highly sensitive to people, their situations and emotions. They can understand and read people without talking about the matter. Also, they are highly creative and make reputable names for themselves in related careers.

**23. Shape: OWOWO:** This kind of individual has a sharp mind with fast decision making and task execution ability. They are very quick to respond. As a result, sometimes due to lack of patience they may get quite aggressive. This aggression can act against them as far as interpersonal interactions are concerned. If they, however, overcome this particular stance, they can soar up above in their professional growth.

**24. Shape: WWOOO:** This kind of person lacks the art of presenting things in the social circuit. He/she may also get superficial while interacting with others. However, they are straightforward in their behavior for others. People may not accept their naïve views because they might take it up as shallow. They should not be surprised by this behavior of others towards them. They also need to work hard upon their communication and oratory skills if they are involved in related occupations.

**25. Shape: OOWOW:** These individuals have high cognition. They are opportunists. They grab any chance coming their way. They can excel in field relating to stocks, investments and finance. Their fortune increases with age. They need to nurture this specialty of theirs. It is quite uncommon.

**26. Shape: OOWWO:** A person having the above-mentioned combination of patterns in this sequence is a person of strong character. He/she is highly honest with himself as well as others. This also sets up their reputation amongst others. However, for them, materialistic and monetary wealth matters. They need to be cautious about getting betrayed in business or

conned by others they trust. They need to be more diplomatic.

**27. Shape: OOOWO:** They have enhanced interpersonal intelligence and social skills. They easily get help from influential people because of their jovial nature towards people. They, however, look into others for guidance rather than looking into themselves.

However, their association with people of importance

aides in getting up the ladder of success. After a certain age, they flourish in their prospective careers.

**28. Shape: OOWOO:** A person having this sequence of patterns is of courageous nature. He/she is hard working towards whatever task they are assigned to. They do have chances of making others envious or rival to them. Although it can be overcome if he/she works in this prospect and maintain harmony among others. They need to accept the fact that the companionship of others is necessary as one moves further ahead in life. They need to take a mature step towards this prospect with the help of some counseling.

**29. Shape: OWOOO:** This type of person is very kind and humanitarian. They are easy to mingle with and maintain good rapport among friends. However, they lack the skills required for doing business and understanding the wests and turns of the commercial sector. They are highly inclined towards academics and acquiring knowledge. However, due to their enhanced inner conscience and jovial attitude towards life, they succeed at being good teachers or scholars. They can also be spiritual masters as they have enhanced understanding of existence, the purpose of life and values, morals and meanings of life.

**30. Shape: WOOWW:** The people having above mentioned combination of patterns in a perfect sequence are quite reputable in their circles. They have a strong yet nonintrusive character. They Makepeace with themselves and others out there. But they may get into small issues due to their pride. Unconsciously, they may hurt others, especially those who are in important positions in his/her lives.

**31. Shape: WOOWO:** People with this sequence are logical beings. They are practical in outlook. Yet they are quite simple in their take on matters related to day-to-day life. However, they lack a basic issue. They do not focus on the fundamentals of whatever they pursue. This highlights their impatient nature. They need to overcome this hurdle to rise up the success

ladder. They are destined to earn monetary wealth and earn respect from people.

**32. Shape: WOOOW:** This class of people is very straightforward when it comes to putting their views on some matter before others. They have a steady and strong character. They too have the chance of offending the wrong kind of people due to this straight forward nature. However, by the prime of their age, they rise up the success ladder to an important position. Then only they face positive changes in their professional life.

#### 4. SYSTEM ARCHITECTURE

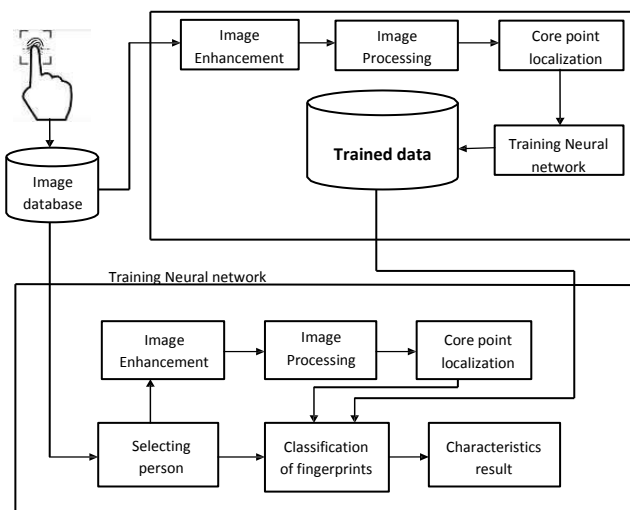


Fig. 4.1: System Architecture

**Fingerprint capture:** The fingerprint scanner is used to capture the fingerprint of the individual and stored in a database.

**Image enhancement:** The aim of the image enhancement phase is to provide an image of high quality. Quality fingerprint image which has a high contrast, noisy, broken, blur, missing minutiae technique such as grey-level smoothing, histogram equalization.

**Image processing:** This model includes the method of converting the image into digital form and performs some operation on it, in order to get an enhanced image or to extract some useful information from it.

**Core point localization:** In fingerprint scanning, the core point refers to the center area of a fingerprint. A fingerprint may have multiple cores or no core. The core point may be one of several types of the pattern including **Whorl pattern:** The core point is found in the middle of the spiral. **Loop pattern:** The core point is the top region

**Training Neural network:** the original goal of a neural network is to solve the problem in the same way as that of the human brain does, In this model artificial neural network(ANN) gets trained with all the features that are given in database and provides the appropriate solution based on the problem given.

**Classification of fingerprints:** The user provides fingerprints then extracted features are taken and matched with the features present in the database of the neural network later ANN provides the appropriate features of the respective fingerprint.

**Database:** A database that stores the student fingerprint templates and features of trained artificial neural networks is stored in the database.

#### 4.1 Data Flow Diagrams

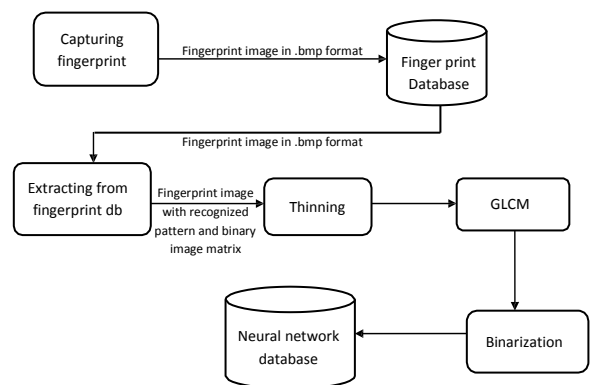


Fig. 4.1.1: Dataflow diagram for training a Neural network

**Binarization:** It converts the greyscale image into a binary image. In this process, a threshold value is fixed. The pixel values above the pre-decided threshold are set as 1 and the pixel value below the threshold is set as 0. So, the greyscale image is converted to binary as the binary image.

**Thinning:** The binary image of the fingerprint is filtered using a block filter. The binary image is thinned by using a block filter. It reduces the thickness of the ridges to the width of a single pixel. It extracts minute points effectively Thinning keeps the location orientation of minute points compared to the original fingerprint remains the same. So, it provides an effective estimation of minute points.

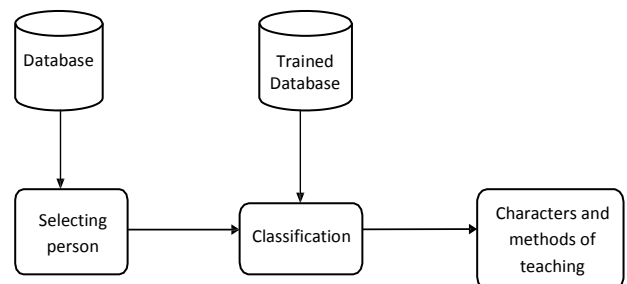


Fig. 4.1.2: Dataflow diagram for displaying characteristics

### 4.2 Gray-Level Co-occurrence Matrix

The GLCM, which is a square matrix can reveal certain properties about the spatial distribution of the gray-levels in the texture image.

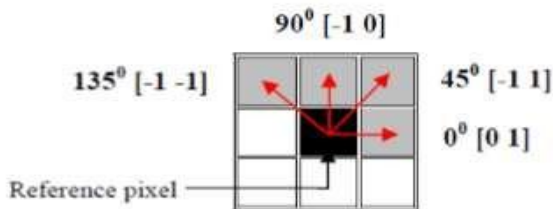


Fig. 4.2.1: Co-occurrence matrix direction for extracting features.

It shows how often a pixel value is known as the reference pixel with the intensity value  $i$  occur in a specific relationship to a pixel value known as the neighbor pixel with the intensity value  $j$ . So, each element  $(i, j)$  of the matrix is the number of occurrences of the pair of a pixel with a value  $i$  and a pixel with value  $j$  which are at a distance  $d$  relative to each other. The spatial relationship between two neighboring pixels can be specified in many ways with different offsets and angles, the default one being between a pixel and its immediate neighbor to its right. In the present work, four possible spatial relationships ( $0^\circ$ ;  $45^\circ$ ;  $90^\circ$  and  $135^\circ$ ) were specified and implemented. For the  $0^\circ$  co-occurrence matrix, there are 2 occurrences of the pixel intensity value 1 and pixel intensity value 3 adjacent to each other in the input image. Also, the occurrence of pixel intensity value 3 and pixel intensity value 1 adjacent to each other is 2 times. Hence, these matrices are symmetric in nature and the co-occurring pairs obtained by choosing  $\theta$  equal to  $0^\circ$  would be similar to those obtained by choosing  $\theta$  equal to  $180^\circ$ . This concept extends to  $45^\circ$ ,  $90^\circ$  and  $135^\circ$  as well.

### 5. RESULTS

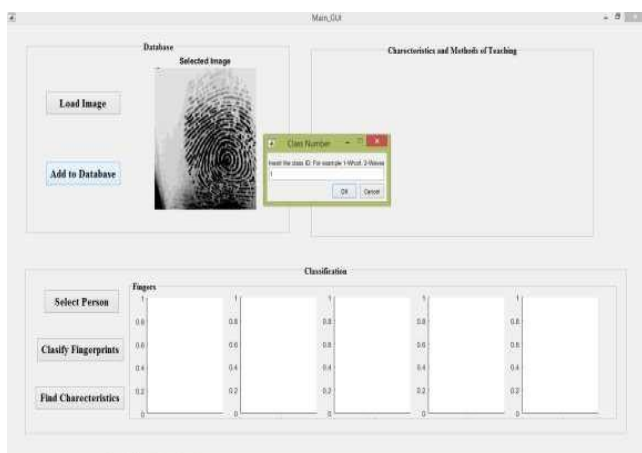


Fig. 5.1: Training a Neural network with whorl images.

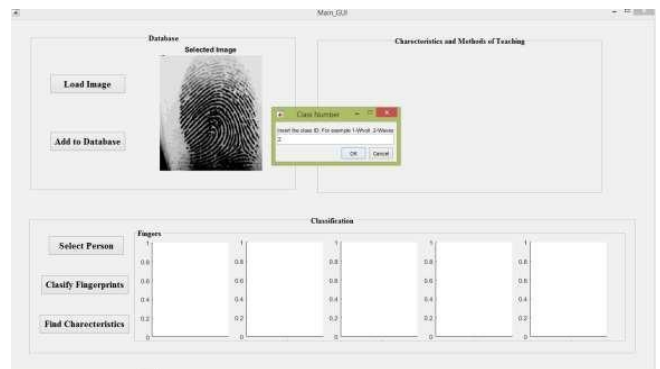


Fig. 5.2: Training a Neural network with loop and arch images.

Selecting fingerprint templates that are stored in the database, and identify the templates with their respective type. And train the neural network with the images in the Database by representing their type, as the neural network works as same as the human brain does. And store these trained images in the neural network database.

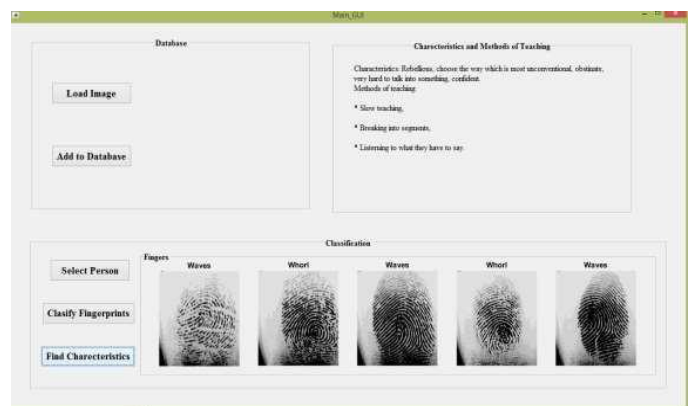


Fig. 5.3: Characteristics and methods of teaching.

### CONCLUSIONS

Dermatoglyphics is like a map that leads one to understand his own potential and talents. Everyone inherits innate intelligence from their parents. And everybody genetic parents, and have the innate intelligence from their parents. If one's intelligence gets no opportunity to be inspired and further developed, there is no way for one to develop a full range of intelligence of memory, understanding, reasoning, analysis, integration, and application. By analyzing dermatoglyphics, we can accurately understand the distribution and amount of cells in the left and right brain of the cell and predict where the potential lies. Although everyone is bored with strengths and weaknesses; if they are identified early, we may further develop the strengths and improve our weakness, so that the left and right brain may grow in a more balanced and blend way.

## FUTURE SCOPE

The study of Dermatoglyphics includes multiple intelligences in students which will help in understanding a great individual's potential & personality Type. Dermatoglyphics Multiple Intelligence study is based on understanding from Neuroscience, Genetics, Dermatoglyphics, Psychology and Embryology. It has been formulated by scientists and Medical experts, which has accepted by the Entire world and also from renowned universities. Medical experts and Approved clinical experience confirmed that fingerprints provide accurate analysis of humans Multiple Intelligences and inborn potential. Traditionally only IQ test is used to be a measurement tool for the degree of intelligence.



**Arpitha S P** is in final year, pursuing B.E. degree in Information Science and Engineering at Bapuji Institute of Engineering and Technology College, Davanagere.



**Prerana V Patil P** is in final year, pursuing B.E. degree in Information Science and Engineering at Bapuji Institute of Engineering and Technology College, Davanagere.

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## AUTHOR PROFILES



**Sheik Imran** received an M.Tech. Degree in Computer Science from Bapuji Institute of Engineering and Technology in 2010. Since 2006, working as Assistant Professor at the Bapuji Institute of Engineering and Technology.



**Chandan V** received an M.Tech degree in Computer Science from the Bapuji Institute of Engineering and Technology in 2012. Since 2008, working as Assistant Professor at the Bapuji Institute of Engineering and Technology.