CHAPTER-1

INTRODUCTION

HANDWRITING:

Handwriting is the way of writing of an individual which is done with a writing instrument, such as a pen or pencil, in the hand. Handwriting includes both printing and cursive styles and is separate from formal calligraphy or typeface. Because each person's handwriting is unique and different, it can be used to verify a document writer.

Each person has their own unique style of handwriting, whether it is everyday handwriting or their personal signature. Even identical twins who share appearance and genetics do not have the same handwriting. The place where one grows up and the first language one learns melt together with the different distribution of force and ways of shaping words to create a unique style of handwriting for each person.

Uniqueness:

Handwriting is unique as such as fingerprint of an individual that is each person will have their own uniqueness in their handwriting. A person will not have similar handwriting of another which will differ in any of the characteristics features of handwriting.

Characteristics of handwriting include:

- Specific shape of letters, e.g. their roundness or sharpness
- Regular or irregular spacing between letters
- The slope of the letters
- The rhythmic repetition of the elements
- The pressure to the paper
- The average size of letters
- The thickness of letters

GRAPHOLOGY

Graphology is the analysis of the physical characteristics and patterns of handwriting claiming to be able to identify the writer, indicating the psychological state at the time of writing, or evaluating personality characteristics. It is generally considered a pseudoscience. The term is sometimes incorrectly used to refer to forensic document examination, due to the fact that aspects of the latter dealing with the examination of handwritten documents are occasionally referred to as graphanalysis.

HANDWRITING ANALYSIS

It is a projective technique like body language which can profile human behaviour in the areas of social skills, thinking styles, work habits, and possible ways of dealing with stress.

It is a system of studying the frozen graphic structures which have been generated in the brain and placed on paper in the form of handwriting.

It is a method to view the emotional development of an individual relative to maturity and consistent actions.

Handwriting analysis is a standard forensics practice to assess the identity of a person from written documents. Forensic document examiners consider different features related to the motion and pressure of the hand, as well as the shape of the different characters and the spatial relationship among them. While examiners rely on standard protocols, documents are generally processed manually. This requires a significant amount of time and may lead to a subjective analysis which is difficult to replicate

The science of handwriting analysis is based on the premise that no two individuals can produce exactly the same writing and that an individual cannot exactly reproduce his own handwriting, otherwise known as variation. Variations are natural deviations that occur in a person's handwriting.

HISTORY

Handwriting analysis is incredibly important in identifying forgeries. Checks and other important documents that requires handwriting are mostly been forged, but forensic handwriting analyst can judge their authenticity and therefore prevent criminals from getting away with their misdeed.

Handwriting analysis, sometimes called graphology was first proposed in 19th and 20th century by Abbe Jean Michon, Alfred Binet and Milton Bunker. However, graphology has more to do with the relation of handwriting styles to psychology and personality of the writer than actual forensic examination.

Forensic handwriting analysis wasn't actually used or introduced in criminal investigations until the beginning of the 20th century. Most notably, the kidnapping of Charles Linbergh's baby in the 1930's marked the beginning of handwriting analysis in forensic investigations.

SIGNIFICANCE OF HANDWRITING ANALYSIS IN FORENSIC SCIENCE:

- ❖ The graphological studies plays a very important role in the forensic science for dealing with the cases related with psychiatric activity of any criminal or the cases related with any suicide notes, anonymous letter etc.
- ❖ Graphology in forensic is the study of handwriting especially that found in ransom notes, poison pen letters or blackmail demands.
- ❖ The identification of a criminal on basis of its personality which are also helpful in finding the modus operandi of any serial killer or an insane criminal.
- ❖ **Handwriting analysis** falls into the questioned documents section of forensic science. These documents are examined by expert questioned documents examiners or QDEs.
- ❖ QDEs look for forgeries and alterations and make comparisons if there is an original sample of handwriting available.
- ❖ Handwriting analysts say that people could have a few writing characteristics that are the same but the likelihood of having any more than that is impossible. The similarity in handwriting would be due to the style characteristics that we were taught when we were learning handwriting in school out of a book. Thus, handwriting is as unique as a fingerprint.
- ❖ Handwriting analysis is looking for small differences between the writing of a sample where the writer is known and a writing sample where the writer is unknown. Instead of beginning to look for similarities in the handwriting a QDE begins to search for differences since it's the differences that determine if the document is a forgery. A QDE is looking at three things: letter form, line form and formatting.

•**Letter form**– This includes curves, slants, the proportional size of letters (relationship between size of short and tall letters and between the height and width of a single letter), the slope of writing and the use and appearance of connecting lines (links) between letters. A person may form a letter differently depending on where the letter falls in a word – beginning, middle or end. So, an analyst will try to find examples of each letter in each placement.

•**Line form**– This includes how smooth and dark the lines are, which indicates how much pressure the writer applies while writing and the speed of the writing.

•**Formatting**– This includes the spacing between letters, the spacing between words, the placement of words on a line and the margins a writer leaves empty on a page. It also considers spacing between lines.

Content, such as grammar, spelling, phrasing and punctuation should also be looked at. A problem that arises during handwriting analysis is simulation, which is the attempt to disguise one's handwriting or the attempt to copy another's. Simulation is a huge problem because it can make it much harder to make determination about a questioned document or it can make it impossible. It can be possible to determine simulation though. The following factors are to be looked at:

- Shaky lines
- Dark and thick starts and finishes for words
- A lot of pen lifts

All these factors are present when someone is forming letters slowly and carefully instead of naturally which is done quickly and without a second thought. Simulation is only one factor that could lead to a handwriting analysis being inaccurate. Some other factors include drugs, exhaustion and illness. Other factors are made by human error, like comparing uppercase and lowercase letters or by not having good exemplar (sample from the suspect).

CHAPTER-2

LITERATURE REVIEW

Amira E Youssef, Ahmed S Ibrahim, A Lynn Abbott 2013.

This paper is concerned with off-line handwriting analysis for the purpose of identification of the writer's gender. Such identification is a useful tool in forensic handwriting analysis. Previous studies have indicated that handwriting by males and females tend to exhibit distinctive characteristics, even across different languages and cultures. We have investigated the hypothesis of language independence by applying machine-learning techniques to handwriting samples in two languages. The two languages, Arabic and English, are representative of other languages that use the same character sets. In particular, Arabic uses the same characters as Urdu and Persian, while English is based on the same character set as French, Spanish, Italian, and other Latin languages. Using a database in which 282 individuals provided handwriting samples in both Arabic and English along with gender information, several classifiers were implemented and compared. Each classifier utilized support vector machines (SVM) to identify the gender of the writer. For classifiers that were trained separately for the two languages, an accuracy of 68.6% was observed for Arabic, while an accuracy of 85.7% was observed for English. When trained using handwriting samples for both languages, an accuracy of 74.3% was observed. These results indicate that language-independent analysis can eventually be employed in forensic analysis.

Daxa J Shah, MS Dahiya 2014.

The study was based on class characteristics of Gujarati, and Malayalam linguistics groups in English handwriting. Investigation was carried out to identify the class characteristics of handwriting of the people from Gujarat and Kerala. The specimen samples of English handwriting were taken from the those who have studied their schooling in local language. The English handwriting samples of around thousand subjects were collected and their class characteristics such as writing movement, formation of letter, letter designs, pen-lifts, letter size, artistic ability, letter spacing and embellishments has been systematically examined to

study the impact of the regional language's script over English. In total, eleven features were identified that occurred in English of handwriting samples and therefore considered class characteristics. The results revealed that class characteristics frequently stem from the given writing system due to their local scripts. which plays a vital role in identification of the writer's geographical region of origin.

Jim Cummins 1991.

The study was focused on interdependence of first and second language proficiency in bilingual children. When children begin the acquisition of a second language (L2), whether in the home or at school, their cognitive resources clearly play a central role in the rapidity and ultimate success with which that language is acquired. Other individual factors, such as motivation, and contextual factors that determine amount and type of exposure to the second language, are also central to the acquisition process and in most situations are likely to interact with cognitive factors. I argue in this chapter that the process of second-language acquisition can be clarified by distinguishing between two dimensions of proficiency that relate in specific ways to determinants of the acquisition process, namely, attribute-based and input-based aspects of proficiency

James W Pennebaker, Laura A King 1999.

Studies examined the reliability, factor structure, and validity of written language using a word-based, computerized text analysis program. Daily diaries from 15 substance abuse inpatients, daily writing assignments from 35 students, and journal abstracts from 40 social psychologists demonstrated good internal consistency for over 36 language dimensions. Analyses of the best 15 language dimensions from essays by 838 students yielded 4 factors that replicated across written samples from another 381 students. Finally, linguistic profiles from writing samples were compared with Thematic Apperception Test coding, self-reports, and behavioural measures from 79 students and with self-reports of a 5-factor measure and health markers from more than 1,200 students. Despite modest effect sizes, the data suggest that linguistic style is an independent and meaningful way of exploring personality.

Murat Topaloglu, seher Ekmekci 2017.

This study was based on gender detection and identifying one's handwriting with handwriting analysis. In terms of demographic properties, many statistical and mathematical analyses

investigate similar and different variables. Especially, differences regarding gender have become subject to research. Therefore, detecting gender through handwriting can give pace to research in other disciplines. Moreover, the research can be useful in any field where gender detection is needed. This study fulfils two objectives. The first one is to find out whether a writer can identify his/her own handwriting. The second objective is to detect the gender of a writer of a text with the help of graphology and computer sciences. The impact of the study is reflected in the fact that findings can be used in fields where gender detection is needed, and that the detection is done with the help of expert and intelligent systems. At the end of the study, gender detection was performed for the individuals by making use of 133 attributes. Then, a decision tree and lists of rules were created with some algorithms. The purpose was to detect the gender of the person by making a character analysis of the handwriting with the help of decision tree formation methods in data mining. The analysis showed that it is possible to detect the gender of a person with the use of the specified attributes. The study reached a success level of 93.75% with ID3 algorithm.

Kinjal Chaudhari, Ankit Thakkar 2019.

Personality is a combination of various characteristics and qualities of an individual. It may be affected by the growth and evolution of one's values, attributes, relationships with the community, personal memories of life events, habits, and skills. Behaviours and decisions of an individual are largely directed by his/her personality. Identification of such a personality trait can be performed based on an individual's handwriting features. Handwriting may be unique for each person and a person's nature, behaviour, and certain psychological aspects can be inferred based on it. It is introduced as the field of graphology, also called graphoanalysis, to analyse personality based on handwriting. According to graphology, there is a vast range of features of handwriting strokes which carry psychological characteristics of the writer. In this survey, we present links between handwriting and personality psychology and examine different mechanisms for features extraction to predict a writer's personality. Psychologically supported handwriting features help to understand personality traits. The paper relates these features and encourages the use of computer-based graphology for personality prediction. It also discusses applications of graphology in various fields.

Akram Bennour, Tahar Mekhaznia 2019.

Writer characterization from images of handwriting has remained an important research problem in the handwriting recognition community that finds applications in forensics,

palaeography and neuropsychology. This paper presents a study to evaluate the effectiveness of an implicit shape codebook technique to recognize writer from digitized images of handwriting. The technique relies on identifying the key points in handwriting and clustering the patches around these key points to generate an implicit shape codebook. A writer is then characterized by probability distribution of producing the codebook patterns. Experiments are carried out in text-dependent as well text-independent mode using the standard BFL and CVL databases of handwriting images. Promising identification and verification performance are reported in a number of interesting experimental scenarios.

CHAPTER-3

AIM AND OBJECTIVES

AIM:

To compare and analyse the similarities in Malayalam and English writing.

OBJECTIVE:

- To collect number of samples from different individuals.
- To analyse and identify the similarities in Malayalam and English writing.

CHAPTER-4

MATERIALS AND METHODOLOGY

MATERIALS REQUIRED:

Paper, pen

Specimen: Total number of samples used are 20 handwritten samples from different individuals.

METHODOLOGY:

The main methods and procedure that is used for this particular analysis and comparison between the Malayalam script and English script of an individual writings are:

- 20 samples are collected are from different individuals.
- Primary examination is conducted for each and every samples that are collected.
- Then the samples are analysed and compared properly with considering all the features such as:
    - Strokes: Stroke is a mark which is from the starting to the end of any writing which is made with any writing instruments such as pencil, pen etc
    - Pressure of the strokes: The pressure that is given to the particular writing instrument when he/she is making a stroke.
    - Slants of the strokes: The angle of the stroke is the slant of the stroke. The slant can refer to either upstroke or downstroke.
    - Spacing between the letters: Space or gap that are given between each and every letter of a word.
    - Spacing between the words: Spaces or gap that are given between each and every word.
    - Size of the letters and words: The measure or the dimension of the letter and word.
    - Shapes of the letters and the words: The particular shapes such as curved, linear etc of the particular letter and word or the external form or outline of the particular letter and word.

- Strings of the letters (the connections that are formed in the letters and the words).
- Baseline and Alignments of the letter: Baseline is an imaginary line in which all the letters stands and the alignment of letters is position of the letter which can considered such as to the left, centre and right.
- Height relationship between the letters: The variations that occur in length of each letters.

CHAPTER-5

RESULT AND CONCLUSION

Document examination:

Handwriting analysis is an important part of document examination. The handwriting of any document can be examined or analysed in many different types of ways. In this study strokes, pressure of the strokes, slants of the strokes, size of the letter, spacing between the letters, spacing between the words, strings of the letter, base line and alignment of letters, shape of the letter and word was analysed to study the similarities and dissimilarities of Malayalam and English scripts of an individual.

20 samples were collected from different individuals in which writings of their local (Malayalam) and standard (English) were written.

Each and every sample was analysed and compared for the similarities and dissimilarities has been examined by observing features of that particular handwritings.

Some of the samples and their observations are represented below:-

Entrepreneurial values generally lead to Entrepreneurial attitude. In Muslim populated areas, Money lending business will not thrive. Muslims basically are against accepting interest and they seldom deposit excess funds in money lending business in other areas which are thickly populated by other castes and communities there will be mushroom growth of institution. Many depositors

[Malayalam handwritten text]

The French Revolution was a period of time in France when the people overthrew the Monarchy and took control of the government. The Revolution came to an end 1799. When the French Revolution broke out in 1789, its main purpose was to address the financial problems of the Region. The numerous wars of the 18th century to which France was involved, eg:- the French and the Indian Wars, had caused the Government to spend more than it received in Revenue.

[Malayalam handwritten text]

Entrepreneurial values generally lead to entrepreneurial attitude. In Muslim populated areas, Money lending business will not thrive. Muslims basically are against accepting interest and they seldom deposit excess funds in money lending business. In other areas which are thickly populated by other castes and communities there will be mushroom growth of moneylending institutions. Many depositors and lenders will be there. Attitude reflect how you feel about something. A person acquires value and attitude from his family and through training entrepreneurial development programmes are conducted to include entrepreneurial values and attitudes these values and attitudes guide him in the management of the business enterprise. Entrepreneurship is not a matter of heritage. It is entirely a manifestation of the different competencies that a person possess irrespective of his caste community colour and creed. Any person having the following competencies can shine as a successful entrepreneur.

[Malayalam handwritten text]

Entrepreneurial Values generally lead to Entrepreneurial attitudes. In Muslim populated areas, Money lending business will not thrive. Muslims basically are against accepting interest and they seldom deposit excess funds In Moneylending business. In other areas which are thickly populated by other Castes and communities there will be a Mushroom growth of Moneylending Institutions. Many depositors and lenders will by there. Attitude reflects how you feel about something. A person Acquires Values and Attitude from his family and through training. Entrepreneurial Values and attitudes. These Values and attitudes guide him in the Management of the business / enterprise.

[Malayalam handwritten text]

I went outside and looked out at the fields. There he was. I could see him walking between the rows, his body bent over the little plants, hoe in hand. I walked slowly out to him, trying to think how I could ask him for the money. There was a cool breeze blowing and a sweet smell of mesquite fruit in the air, but I didn't appreciate it. I kicked at a dirt clod. I wanted that jacket so much. It was more than just being a valedictorian and giving a little thank you speech for the jacket on graduation night. It represented eight years of hard work and expectation. I knew I had to be honest with Grandpa; it was my only chance. He saw my shadow and looked up. He waited for me to speak. I cleared my throat nervously and clasped my hands behind my back so he wouldn't see them shaking. 'Grandpa, I have a big favour to ask you.' I said in Spanish, the only language he knew.

[Malayalam handwritten paragraph — illegible]

Refraction is the bending of light when a ray of light travels from one medium to another. Due to the change of medium, phase velocity of the wave is changed, but its frequency remains constant. When a scale is immersed in a glass of water, it seems to be bended due to refraction. Optical illusion, which is observed usually in deserts and highways on hot summer days. Mirage.

[Malayalam handwritten paragraph — illegible] H.D.I ... 1990 ...

Refraction is the bending of light when a ray of light travels from one medium to another. Due to the change of medium, the phase velocity of the wave is changed but its frequency remains constant. When a scale is immersed in a glass of water, it seems to be bended due to refraction. Scale appears to be bended due to refraction. Optical illusion which is observed usually in deserts and highways on hot summer days. Mirage.

[Malayalam handwritten paragraph — illegible]

Rock eagle owls are very long to male found only in the Indian Subcontinent. They are also called Bengal eagle owls. A particular feature of these birds is the collection of the feather forming upon a bunch's brow heads ... tufts. Their overall plumage is a flash of the brown and grey. They exhibit a white patch, white plumage is blank on the throat, but younger birds lack this throat patch and are really white.

[Malayalam handwritten paragraph — illegible]

SAMPLE-9

SAMPLE-10

Sogam are beautiful, just like a fairy-tale land, located more than 100 kilometers from the main city of srinagar on the arm of the Indo quilt. Apart from the Yaushak, a local stream, Sogam housed gorgeous paddy fields that looked like a sheet of green during summers and were stripped bare during the winters, when we often played cricket on those frozen acres.

[Malayalam handwritten text]

Entrepreneurial values generally leads to entrepreneurial attitudes in Muslim populated areas. Money lending business will not thrive. Muslims basically are against accepting interest and they seldom deposit excess funds in Money lending business in other areas which are thickly populated by other castes and communities. There will be mushroom growth of imitations. Money depositor

[Malayalam handwritten text]

SAMPLE-11

SAMPLE-12

Non-availability of skilled labour

In India, because of the huge population size, labour force is supposed to be abundant. But the true picture is that employable persons are scarce, especially skilled labour. A World Bank study says that India is starting at a labour crises mainly in construction sector. The supply of skilled and semi-skilled workers will barely keep up with the pace of growth. India will fall short by 16-23%. under medium growth scenario. In a high growth scenario, the shortage will be to the tune of 55-64% over the next eight years. Entrepreneurs are busy setting up skill training institutes for blue collar workers.

[Malayalam handwritten text]

During and in the Delhi Sultanate, there was a synthesis of Indian Civilization with that of Islamic Civilization, and the further integration of the Indian subcontinent with a growing world system and wider International networks spanning large parts of Afro-Eurasia, which had a significant impact on Indian culture and Society, as well as the wider world. The time of their rule included the earliest forms of Indo-Islamic architecture, greater use of mechanical technology, increased growth rates in India's population and economy, and the emergence of the Hindu-Urdu language.

[Malayalam handwritten text]

SAMPLE-13

Refraction is the bending of light when a ray of light travels from one medium to another. Due to the change of medium, phase velocity of the wave is changed, but its frequency remains constant. When a scale is immersed in a glass of water, it seems to be bended due to refraction, optical illusion. Which is observed usually in deserts and highways on hot summer days mirage.

[Malayalam handwritten text]

SAMPLE-14

The Bhakti movement emerged at first in Tamil Nadu. This movement was led by the Alwars and the Nayanars. The Alwars were Vaishnavities and the Nayanars, Saivities. They composed and propagated devotional songs. Both the Alwars and the Nayanars opposed caste inequalities. Among them there were women saints also. The woman saint Andal was one of the famous Vaishnavite saints. Another women saint Karaikkal Ammayar was a Saivite.

[Malayalam handwritten text]

SAMPLE-15

The French Revolution was a Period of time in France when the People overthrew Monarchy and took control of the government. The revolution came to an end in 1789

[Malayalam handwritten text]

SAMPLE-16

The French Revolution was a period of time in France when the people overthrew the Monarchy and took controls of the Government. The revolution came to an end 1789. When the French revolution broke out in 1989, its main purpose was to address to financial problems of the regime. The numerous wars of the 18th century in which France, was involved, eg: the French and Indian war, had caused the government to spend more than it received in revenue.

[Malayalam handwritten text]

SAMPLE-17

Globalisation is the process of interaction and integration among people, companies, and governments worldwide. As a complex and multifaceted phenomenon, globalisation is considered by some as a form of capitalist expansion which entails the integration of local and national economies into a global, unregulated market economy. Globalisation has grown due to advances in transportation and communication technology. With the increased global interactions comes the growth of international trade, ideas and culture. Globalisation is primarily an economic process of interaction and integration that's associated with social and cultural aspects.

ദേശീയ സമ്പദ്ഘടനയുടെ ഭൂരിഭാഗവുമായ
സംയോജനവും ആഗോളതലത്തിൽ മറ്റുവിവിധ രാജ്യവുമായുള്ള
ആഗോള സമ്പത്തുമായുള്ള സാമ്പത്തികവുമായുള്ള
വ്യാപാരവും സങ്കേതികവിദ്യയുടെ വളർച്ചയും
സാമൂഹികവും സാംസ്കാരികവുമായ ...

SAMPLE-18

The French Revolution was a period of time in France when the people overthrew the monarchy and took control of the government. The revolution came to an end in 1799. When the French Revolution broke out in 1789, it's main purpose was to address the financial problems of the regime. The numerous wars of the eighteenth century in which France was involved, e.g. the French and Indian war, had caused the government to spend more than it received in revenue.

ഫ്രഞ്ച് വിപ്ലവം - 1789 ഗ്രാൻ വാർത്തയിൽ
അതിന്റെ ...

SAMPLE-19

Ans: CFCs, discharge in the lower part of the atmosphere move upward and reach stratosphere, where UV rays act on CFCs and release chlorine atom. Chlorine atom act as a catalyst and degrade ozone releasing molecular oxygen. As chlorine atom are not consumed in this process, whatever CFCs are added to the stratosphere, they have permanent continuous effect on ozone layer that result in permanent depletion of ozone layer and causes ozone hole. Depletion lets in more UVB radiation to the earth's surface causing damage of DNA and mutation. It also cause ageing of skin, skin cancer etc.

6. Nowadays many farmers are interested in organic farming. What is meant by organic farming? Can you suggest any two advantages of organic farming?

Ans.
...

SAMPLE-20

Entrepreneurial values generally lead to entrepreneurial attitudes. In muslim populated areas money lending business will no thrive. Muslims basically are against accepting interest and they seldom deposit extra funds in moneylending business. In other areas which are thickly populated by other castes and communities there will be a maximum growth of money lending institutions. Many deposites and lending will be there. Attitude reflects how you feel about something. A person acquires values and attitude from his family and through training.

RESULT:

The above shown handwriting samples, each samples are having common similarities in their characteristics features of Malayalam and English Scripts such as their pressure of the stroke, size of the letter, spacing between the letters, spacing between the words, strings of letter, height relationship between letter etc.
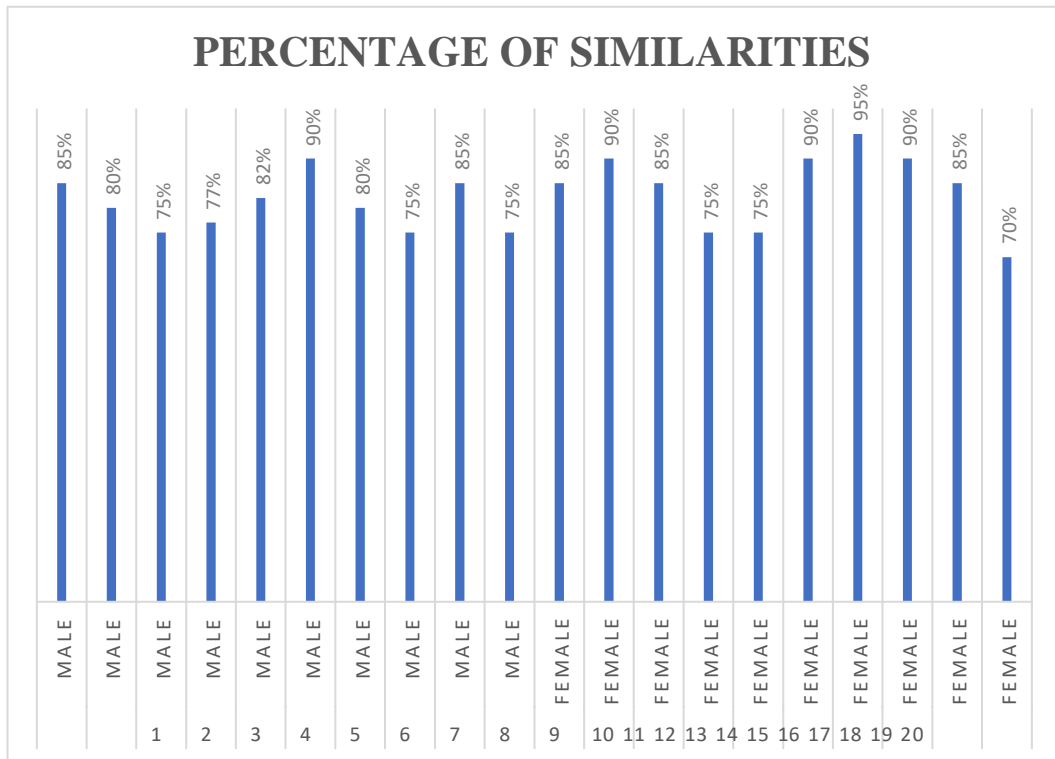
Therefore, the handwriting of Malayalam and English language writing of an individual will be similar with their characteristics features. It may be useful for collecting different language specimen or handwriting standards for the identification of handwriting.

In the Handwriting analysis conducted for 10 male & 10 Female it is observed that, regardless of gender there is 80% of similarities in Malayalam & English scripts of individuals.

80% - 84% of average similarities can be observed from the analysis for Bilingual individuals of Malayalam & English.

Table 5.1. : Percentage of Similarities observed in Handwriting samples

S.No.	Sample No.	Gender	Percentage of Similarities
1	1	Male	85%
2	2	Male	80%
3	3	Male	75%
4	4	Male	77%
5	5	Male	82%
6	6	Male	90%
7	7	Male	80%
8	8	Male	75%
9	9	Male	85%
10	10	Male	75%
11	11	Female	85%
12	12	Female	90%
13	13	Female	85%
14	14	Female	75%
15	15	Female	75%
16	16	Female	90%
17	17	Female	95%
18	18	Female	90%
19	19	Female	85%
20	20	Female	70%

PERCENTAGE OF SIMILARITIES

	85%	80%	75%	77%	82%	90%	80%	75%	85%	75%	85%	90%	85%	75%	75%	90%	95%	90%	85%	70%
	MALE	MALE	MALE	MALE	MALE	MALE	MALE	MALE	MALE	MALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

CONCLUSION:

We know that, there are many local languages in India. From this study we conclude that there are many similarities between the writing characteristics of an individual with multi- linguistic scripts.

This could be helpful in future for handwriting experts to examine the similarities in different scripts and conduct hopeful handwriting examination when there is limited standards to rely on.

5.1. TABLE- Handwriting of 5 males.

S.No	CHARACTERS	SUB CHARCTERS	SAMPLE-1		SAMPLE-2		SAMPLE-3		SAMPLE-4		SAMPLE-5	
	LANGUAGE		ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL
1	SIZE(mm)	Upper zone	5mm	7mm	6mm	5mm	3mm	4mm	6mm	8mm	4mm	5mm
		Middle zone	2mm	2mm	2mm	2mm	2mm	2mm	3mm	3mm	2mm	2mm
		Lower Zone	8mm	6mm	5mm	4mm	3mm	3mm	6mm	3mm	3mm	2mm
2	SPACING	Word(mm)	7mm	8mm	6mm	6mm	4mm	7mm	7mm	6mm	5mm	5mm
		Letter(mm)	1mm	1mm	1mm	1mm	1mm	1mm	1mm	1mm	1mm	1mm
		Line(mm)	7mm	7mm	8mm	8mm	7mm	9mm	9mm	8mm	7mm	8mm
3	ALIGNMENT		centre	centre	centre	centre	centre	centre	centre	centre	centre	centre
4	BASELINE		straight	straight	straight	straight	straight	down	straight	straight	straight	straight
5	SLANT		vertical	vertical	right	right	vertical	vertical	vertical	vertical	vertical	vertical
6	PRESSURE		Medium	Medium	High	High	medium	medium	High	High	Low	Low
7	RHYTHM		uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform
PERCENTAGE OF SIMILARITIES			85%		80%		75%		77%		82%	

5.2. TABLE- Handwriting of 5 males.

S.No	CHARACTERS	SUB CHARCTERS	SAMPLE-6		SAMPLE-7		SAMPLE-8		SAMPLE-9		SAMPLE-10	
	LANGUAGE		ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL
1	SIZE(mm)	Upper zone	6mm	6mm	6mm	7mm	5mm	5mm	6mm	5mm	5mm	7mm
		Middle zone	2mm	3mm	2mm	3mm	1.5mm	1.5mm	2mm	2mm	2mm	2mm
		Lower Zone	6mm	4mm	6mm	5mm	4mm	3mm	4mm	3mm	5mm	4mm
2	SPACING	Word(mm)	5mm	5mm	5mm	5mm	4mm	3mm	5mm	5mm	7mm	6mm
		Letter(mm)	1mm	1mm	1mm	1mm	1mm	1mm	0.5mm	0.5mm	1mm	1mm
		Line(mm)	11mm	11mm	12mm	12mm	7mm	8mm	9mm	11mm	12mm	10mm
3	ALIGNMENT		centre	centre	left	left	right	right	centre	centre	left	left
4	BASELINE		straight	straight	straight	straight	down	straight	straight	straight	straight	straight
5	SLANT		vertical	vertical	vertical	vertical	vertical	vertical	right	right	vertical	vertical
6	PRESSURE		medium	medium	medium	medium	High	High	medium	medium	Low	Low
7	RHYTHM		Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform
PERCENTAGE OF SIMILARITIES			90%		80%		75%		85%		75%	

5.3. TABLE- Handwriting of 5 females.

S.No	CHARACTERS	SUB CHARCTERS	SAMPLE-11		SAMPLE-12		SAMPLE-13		SAMPLE-14		SAMPLE-15	
	LANGUAGE		ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL
1	SIZE(mm)	Upper zone	4mm	5mm	6mm	6mm	7mm	8mm	5mm	6mm	7mm	7mm
		Middle zone	2mm	2mm	2mm	2mm	3mm	2mm	2mm	3mm	4mm	2mm
		Lower Zone	3mm	3mm	5mm	4mm	8mm	6mm	4mm	4mm	2mm	2mm
2	SPACING	Word(mm)	4mm	5mm	5mm	5mm	7mm	7mm	8mm	7mm	7mm	6mm
		Letter(mm)	1mm	1mm	1mm	1mm	1mm	1mm	1mm	1mm	2mm	1mm
		Line(mm)	11mm	10mm	11mm	11mm	10mm	10mm	11mm	10mm	9mm	8mm
3	ALIGNMENT		left	left	left	left	left	left	left	left	left	left
4	BASELINE		straight	straight	straight	straight	straight	straight	straight	straight	up	up
5	SLANT		vertical	vertical	vertical	vertical	vertical	vertical	left	vertical	right	right
6	PRESSURE		medium	medium	Low	Low	medium	medium	medium	medium	medium	medium
7	RHYTHM		Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform
PERCENTAGE OF SIMILARITIES			85%		90%		85%		75%		75%	

5.4. TABLE- Handwriting of 5 females.

S.No	CHARACTERS	SUB CHARCTERS	SAMPLE-16		SAMPLE-17		SAMPLE-18		SAMPLE-19		SAMPLE-20	
	LANGUAGE		ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL	ENG	MAL
1	SIZE(mm)	Upper zone	6mm	7mm	4mm	4mm	5mm	5mm	5mm	5mm	5mm	6mm
		Middle zone	2mm	2mm	2mm	2mm	2mm	3mm	3mm	3mm	2.5mm	3mm
		Lower Zone	5mm	4mm	2mm	2mm	5mm	3mm	4mm	3mm	8mm	6mm
2	SPACING	Word(mm)	8mm	8mm	4mm	4mm	6mm	5mm	5mm	4mm	7mm	8mm
		Letter(mm)	1mm	1mm	1mm	1mm	1mm	1mm	2mm	1.5mm	2mm	2mm
		Line(mm)	10mm	10mm	8mm	9mm	10mm	10mm	8mm	8mm	11mm	9mm
3	ALIGNMENT		left	left	left	left	left	left	left	left	left	left
4	BASELINE		straight	straight	straight	straight	straight	straight	straight	straight	straight	straight
5	SLANT		right	right	vertical	vertical	right	right	right	right	right	straight
6	PRESSURE		medium	medium	Low	Low	medium	medium	medium	medium	medium	medium
7	RHYTHM		Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform
PERCENTAGE OF SIMILARITIES			90%		95%		90%		85%		70%	

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