



Study of Variation in Signature of Same Writer

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Abstract— Comparison of signatures are based on the high likelihood that no two person write the same way while considering that fact the writing of each person has its own variability. Thus an analysis of handwriting/signature must compare interpersonal variability. Some characterization of now handwriting/signature features vary across a population of possible writers with intra personal variability. Determining of two signature of the same person depends on showing that their degree of variability by some measures likes slant, loop, angle, baseline and strokes etc. In the present study an attempt is made to provide an effective method of study of variation in signatures of same writers.

Keywords— Handwritten signature, Variation, signature strokes, slant, Baseline Measurement

I. INTRODUCTION

Hand written signature one of the most commonly for authentication of person's identity. The signature is generally a person's most common writing act and, as such, is largely habitual. As there are essentially no rules with respect to devising and producing signatures, they are open for being highly individualized according to each person's mental design. Signatures can be written as tangled, illegible shapes or a series of clearly decipherable letters that distinctly spell out the person's name. No one ever signs identically the same from one time to another even if a writer signs multiple signatures at same time they have also some variation (NAS). Natural variation in signature is a problem for signature verifier as it requires the verifier to judge whether the variation is the natural difference occurring between different instances of a signature or whether the variation is significant enough to reject the instances as being an attempted forgery. The range of natural variation, rather than the characteristics themselves, will change gradually with time. This change justifies the necessity for contempory writing in comparison of handwriting (Kapoor and Sharma 1985). These variations from signature to signature due to temporary effects of either an instrinsic or extrinsic nature, but their overall construction remain intact. This makes signatures highly identifiable, assuming proper standards are available for comparison.

II. METHODOLOGY

In present study 3 sample of signature were collected from the 50 persons for the determination of variation within their own signature on the basis of strokes and other characteristics. The signature were scanned through the scanner and preserve for examination. The signature samples were observed for various parameters to measure the physical characters of the signature samples like their type of stroke position of stroke, and other characteristics and to differentiate the variation in the signature samples.

III. RESULT & DISCUSSION

Table 1 Characteristic Features Writer 1 Signatures

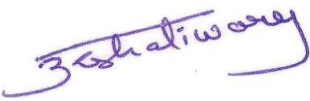
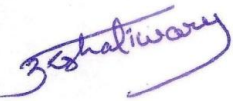
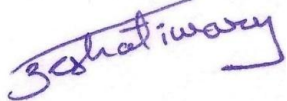
Character	Sample 1	Sample 2	Sample 3
			
Slant	90°	90°	90°
Vertical height	266.09 Px	266.69 Px	273.01 Px
Horizontal length	838.36 Px	770.20 Px	801.68 Px
Initial stroke	Blunt	Blunt	Blunt
Connecting stroke	Garland	Garland	Garland
Terminal stroke	Final pull down and under	Final pull down and under	Final pull down and under
Alignment	Uphill	Uphill	Uphill

Table 2 Characteristic Features Writer 2 Signatures




Character	Sample 1	Sample 2	Sample 3
			
Slant angle	83.7°	85.4°	83.7°
Vertical height	442.98 Px	470.52 Px	461.28 Px
Horizontal length	838.07 Px	814.74 Px	947.81 Px
Initial stroke	Unbending	Unbending	Unbending
Connecting stroke	Arcade	Arcade	Arcade
Terminal stroke	Sharp, below baseline	Sharp, below baseline	Sharp, below baseline
Alignment	Uphill	Uphill	Uphill

Table 3 Characteristic Features Writer 3 Signatures


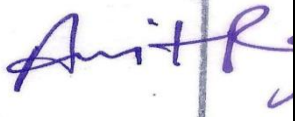
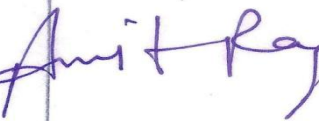
Character	Sample 1	Sample 2	Sample 3
			
Slant angle	90°	90°	90°
Vertical height	440.40 Px	370.70 Px	394.94 Px
Horizontal length	830.30 Px	610.95 Px	1007.40 Px
Initial stroke	Unbending	Unbending	Unbending
Connecting stroke	Moderate Garland	Shallow garland	Shallow garland
Terminal stroke	Coverstroke	Long hooked	Final reaching back to left
Alignment	Uphill	Uphill	Uphill

Table 4 Characteristic Features Writer 4 Signatures



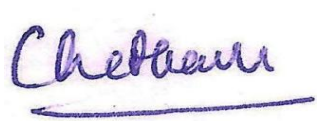
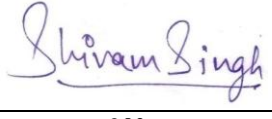
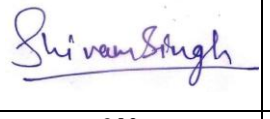
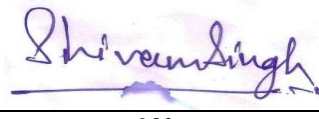
Character	Sample 1	Sample 2	Sample 3
			
Slant angle	90°	91.76°	90°
Vertical height	160.77 Px	125.57 Px	103.79 Px
Horizontal length	344.58 Px	373.51	333.02 Px
Initial stroke	Blunt	Blunt	Blunt
Connecting stroke	Arcade	Arcade	Arcade
Terminal stroke	Long, Blunt, Outward	Upward Tending	Blunt
Alignment	Straight	Uphill	Uphill

Table 5 Characteristic Features Writer 5 Signatures

Character	Sample 1	Sample 2	Sample 3
			
Slant angle	90°	90°	90°
Vertical height	461.47 Px	388.94 Px	413.83 Px
Horizontal length	1222.02 Px	987.51 Px	1018.23 Px
Initial stroke	Unbending	Unbending	Unbending
Connecting stroke	Garland	Garland	Garland
Terminal stroke	Blunt	Blunt	Blunt
Alignment	Downward	Upward	Downward

IV. CONCLUSIONS

The results reported in this study from table 1.1 to 1.5 along with the figures, it has been found that in normal condition of brain, nerve and muscle the most of character and letters were not changed, only a few letters and characters were changed partially, they were not changed completely from start to end of the letter /character. The unchanged part of letters / characters was similar in the movement employed, baseline, position, slant, curves, terminals, connections etc. The unnatural defects such as pen lift, pen pressure, and pen pause and change of impulse did not occurred in these signatures, while the changed part of the letters / characters were rhythmic nature.

REFERENCES

- [1] Kapoor, T.S. and Sharma R. (1985), "Study of the form & extent of natural variation in genuine writing with age", Journal of Forensic Science society, volume 25, page no. 371-375.
- [2] NAS: Strengthening the Forensic Sciences: A Path Forward. National Academy of Sciences press (2009)