



Data Article

Data extraction of the gray level Co-occurrence matrix (GLCM) Feature on the fingerprints of parents and children in Lombok Island, Indonesia



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ABSTRACT

Fingerprint data of parents and children were taken directly from Lombok, Indonesia. This dataset was collected from 30 families consisting of father's, mother's, and child's fingerprints. The data were collected from one family to another, with and without a kinship relationship. It was collected with a U are U 4500 SDK Digital Persona and extracted using the feature extraction method from the Gray Level Co-occurrence Matrix (GLCM). This dataset of parent and child fingerprint data can be used in research to determine the texture similarities of parent and child fingerprints. Furthermore, it can also be used in DNA processing, pattern similarity, and verification.

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Specifications Table

Subject	Computer Science
Specific subject area	Computer Vision and Pattern Recognition
Type of data	Table
How data were acquired	The data is taken directly from people in the Lombok region, Indonesia
Data format	Raw and analyzed
Parameters for data collection	The data taken came from 30 families including the father, mother, and child fingerprints. The age range for data collection was 20-60 years for father and mother, while for children it was 5–25 years. The data collection process involved a total of 15 boys and 15 girls.
Description of data collection	This fingerprint data was taken from 30 different families, where each family was taken on the father, mother, and child. Therefore, the total number of fingerprints as a whole is 90.
Data source location	A All data are in the Lombok region, Indonesia.
Data accessibility	The data are available with this article

Value of the Data

- This dataset is important because it involves the fingerprints of parents and children from 30 different families, which includes the fingerprints of the father, mother, and child. The data were taken from different families without family ties between one family and another.
- The data will be useful for researches related to fingerprint image processing of parents and children, fingerprint patterns of parents and children, deoxyribonucleic acid (DNA), and verification.
- The details of this data can determine if the texture of the fingerprints of both parents and children are the same. This data can also be used to determine the similarity of fingerprint patterns between parents and their children. Furthermore, it can be extracted using the feature extraction and classification methods.

1. Data Description

Parent and child fingerprints have the same texture [1] and pattern [2]. The fingerprint data used were taken from the Lombok region, Indonesia using a U are U 4500 SDK Digital Persona Fingerprint scanner. The data collection involved 30 families, each with 3 fingerprint samples consisting of father, mother, and child, and therefore the total fingerprints used was 90. This detailed fingerprint collection can be seen in Table 1. The family age range is 20-60 years for father and mother, while for children is 5–25 years. At the time of collecting the children’s fingerprint data, it involved a total of 15 boys and 15 girls.

2. Experimental Design, Materials and Methods

The parent’s and children’s fingerprint data were taken from one family to another before the extraction stage, and the fingerprints were cropped from their initial size of 154 × 192 pixels to

Table 1
Fingerprint data are involved.

No	Fingerprint Name	Amount
1	Father’s Fingerprints	30 Fingerprints
2	Mother’s Fingerprints	30 Fingerprints
3	Children’s Fingerprints (15 boys and 15 girl)	30 Fingerprints

Table 2

Child Fingerprint Extraction 0°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Child Family 1	0.46463	0.10975	0.00688	9337.06
Child Family 2	0.39937	0.20868	0.03395	11653.8
Child Family 3	0.63068	0.06955	0.00208	4232.91
Child Family 4	0.35439	0.31187	0.07554	11575.9
Child Family 5	0.55972	0.32424	0.08634	8800.91
Child Family 6	0.47562	0.14708	0.01429	9443.82
Child Family 7	0.33698	0.07944	0.00363	11063.6
Child Family 8	0.33142	0.07574	0.00316	11086.6
Child Family 9	0.33	0.09241	0.00489	11399.3
Child Family 10	0.46612	0.14803	0.01475	9474.64
Child Family 11	0.45277	0.15404	0.0154	10177.9
Child Family 12	0.56049	0.09482	0.00474	7262.29
Child Family 13	0.424	0.2761	0.06176	9972.34
Child Family 14	0.45913	0.09649	0.0052	8859.55
Child Family 15	0.49335	0.36044	0.11374	9661.41
Child Family 16	0.48474	0.1135	0.00737	8846.07
Child Family 17	0.55744	0.28774	0.06788	8738.97
Child Family 18	0.64071	0.17604	0.02103	6648.86
Child Family 19	0.38308	0.09475	0.0052	10461.4
Child Family 20	0.47299	0.13745	0.01247	9383.67
Child Family 21	0.40687	0.09927	0.00553	9931.27
Child Family 22	0.38801	0.09084	0.00467	10553.6
Child Family 23	0.53211	0.10143	0.00558	8012.68
Child Family 24	0.4954	0.12685	0.00959	8876.51
Child Family 25	0.45647	0.10807	0.00672	9377.61
Child Family 26	0.44949	0.09763	0.00554	9261.83
Child Family 27	0.50041	0.23825	0.04332	9760
Child Family 28	0.41288	0.19606	0.02958	11137.7
Child Family 29	0.31866	0.30015	0.0775	13552.2
Child Family 30	0.47041	0.12981	0.01073	9525.15

150 × 150 pixels. The data is filtered using the histogram equalization method after cropping to remove noise from the fingerprint. Furthermore, the fingerprint data is extracted using the Gray Level Co-occurrence Matrix (GLCM) method. The GLCM application is created using the C Sharp (C #) programming language. The GLCM features used for extraction are Correlation, Homogeneity, Contrast, and Energy [2]. GLCM has angled for the direction of the matrix calculation, including angles 0°, 45°, 90°, and 135° [3]. This dataset was extracted using 4 GLCM angles 0°, 45°, 90°, and 135°. Table 2 is GLCM extraction using 0° for children's fingerprints, Table 3 is GLCM feature extraction of 0° for father's fingerprints, Table 4 is GLCM feature extraction of 0° for mother's fingerprints, and Table 5 is the extraction of the GLCM 45° features of the child's finger. Table 6 shows the extraction of the GLCM 45° features of the father's fingerprint, Table 7 shows the extraction of the GLCM 45° features of the mother's fingerprint, Table 8 is the extraction of the GLCM features of 90° for children's fingerprints, Table 9 is the extraction of the GLCM features of 90° of the fathers' fingerprints, Table 10 is the extraction of features of GLCM 90° of the mother's fingerprints, while Table 11 shows the extraction of GLCM 135° features in children's fingerprints, Table 12 is Extraction of GLCM 135° features on father's fingerprints, and Table 13 shows the extraction of GLCM 135° features on maternal fingerprints.

Table 3
Father Fingerprint Extraction 0°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Father Family 1	0.49562	0.10895	0.00667	9024.28
Father Family 2	0.436	0.1095	0.00677	9756.29
Father Family 3	0.75657	0.11986	0.01049	3070.21
Father Family 4	0.4101	0.31082	0.07409	10294.9
Father Family 5	0.49059	0.11513	0.00757	8679.01
Father Family 6	0.57068	0.10878	0.00654	7502.67
Father Family 7	0.25551	0.07934	0.00358	12610.1
Father Family 8	0.43444	0.30818	0.07116	9595.02
Father Family 9	0.45102	0.10313	0.0062	9493.62
Father Family 10	0.52095	0.11723	0.0077	8267.06
Father Family 11	0.56101	0.07969	0.00359	6939.8
Father Family 12	0.38454	0.08825	0.00441	10476.3
Father Family 13	0.47049	0.27926	0.06061	9016.42
Father Family 14	0.46846	0.09896	0.00537	8906.03
Father Family 15	0.46599	0.1093	0.00684	9191.12
Father Family 16	0.50502	0.18437	0.02838	7563.9
Father Family 17	0.53316	0.39489	0.10974	8185.54
Father Family 18	0.59797	0.23203	0.04535	6413.74
Father Family 19	0.43326	0.10722	0.00657	10185.1
Father Family 20	0.40686	0.08932	0.00444	10021.6
Father Family 21	0.52729	0.09745	0.0054	7538.05
Father Family 22	0.37284	0.07622	0.00311	10326.2
Father Family 23	0.45958	0.08664	0.00421	9004.29
Father Family 24	0.46828	0.10029	0.00583	8982.41
Father Family 25	0.51836	0.11337	0.00736	8630.77
Father Family 26	0.62151	0.12468	0.00889	6775.14
Father Family 27	0.55558	0.11487	0.00758	7781.68
Father Family 28	0.47993	0.11457	0.00762	9197.23
Father Family 29	0.45703	0.10792	0.00681	9364.71
Father Family 30	0.51912	0.11134	0.00715	8583.62

Table 4
Mother Fingerprint Extraction 0°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Mother Family 1	0.53099	0.11514	0.0075	8240.13
Mother Family 2	0.4613	0.13911	0.01235	9477.54
Mother Family 3	0.75048	0.15908	0.01691	3298.77
Mother Family 4	0.42156	0.33882	0.08423	10155.3
Mother Family 5	0.60645	0.12835	0.00977	7027.3
Mother Family 6	0.46311	0.16216	0.01808	9831.48
Mother Family 7	0.5266	0.10042	0.00573	8116.66
Mother Family 8	0.66967	0.20877	0.03476	4998.09
Mother Family 9	0.43472	0.09273	0.00488	9880.65
Mother Family 10	0.57624	0.38541	0.10629	7323.5
Mother Family 11	0.56441	0.20897	0.03072	8175.21
Mother Family 12	0.43295	0.09376	0.00481	9715.04
Mother Family 13	0.45822	0.08699	0.00415	8795.94
Mother Family 14	0.54136	0.11766	0.00779	7997.46
Mother Family 15	0.45288	0.09506	0.00495	9116.65
Mother Family 16	0.47743	0.10407	0.006	8862.65
Mother Family 17	0.47085	0.34251	0.09444	9653.01
Mother Family 18	0.65888	0.18097	0.02195	6353.69
Mother Family 19	0.41759	0.0946	0.0049	9891.76
Mother Family 20	0.41759	0.0946	0.0049	9891.76
Mother Family 21	0.54437	0.11835	0.00821	7891.85

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Table 4 (continued)

Family Name	Correlation	Homogeneity	Energy	Contrast
Mother Family 22	0.39248	0.07489	0.00284	9823.07
Mother Family 23	0.45642	0.10012	0.00571	9368.48
Mother Family 24	0.55421	0.10444	0.00592	7622.07
Mother Family 25	0.48371	0.11751	0.00821	8986.45
Mother Family 26	0.62281	0.12459	0.00886	6723.72
Mother Family 27	0.49641	0.10199	0.00579	8659.23
Mother Family 28	0.46047	0.10227	0.00588	9103.05
Mother Family 29	0.52122	0.11333	0.00721	8290.58
Mother Family 30	0.40412	0.10031	0.00569	10077

Table 5

Child Fingerprint Extraction 45°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Child Family 1	0.42137	0.12889	0.00938	10097
Child Family 2	0.3151	0.21646	0.03676	13301.5
Child Family 3	0.40583	0.03929	0.00061	6814.46
Child Family 4	0.23453	0.27763	0.06476	13719.9
Child Family 5	0.33863	0.23698	0.04558	12913.9
Child Family 6	0.34691	0.1519	0.01559	11764.3
Child Family 7	0.18466	0.08312	0.0038	13599
Child Family 8	0.12572	0.07245	0.00294	14499.9
Child Family 9	0.08914	0.08631	0.0043	15498.3
Child Family 10	0.29652	0.1506	0.01547	12484.1
Child Family 11	0.23382	0.1451	0.01463	14256.1
Child Family 12	0.20451	0.07914	0.00339	13133.9
Child Family 13	0.03938	0.18656	0.03111	16619.9
Child Family 14	0.25946	0.09796	0.00545	12633.6
Child Family 15	0.24739	0.29805	0.08207	14354.2
Child Family 16	0.14375	0.10289	0.00648	14699
Child Family 17	0.37672	0.28196	0.06728	12321.3
Child Family 18	0.32839	0.16177	0.0188	12430.7
Child Family 19	0.17233	0.09136	0.00487	14027.9
Child Family 20	0.30118	0.13627	0.01246	12441.9
Child Family 21	0.1328	0.09343	0.00528	14524
Child Family 22	0.13954	0.08426	0.00416	14832.3
Child Family 23	0.31238	0.099	0.00555	11774.7
Child Family 24	0.16932	0.11268	0.00788	14613.2
Child Family 25	0.17393	0.10648	0.00652	14251.1
Child Family 26	0.09381	0.08481	0.00442	15231.5
Child Family 27	0.24208	0.23028	0.04184	14822.9
Child Family 28	0.21372	0.19203	0.02925	14920.9
Child Family 29	0.17279	0.2982	0.07755	16495.4
Child Family 30	0.15786	0.12147	0.00985	15152.1

Table 6

Father Fingerprint Extraction 45°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Father Family 1	0.30195	0.11281	0.00739	12492.1
Father Family 2	0.26392	0.1154	0.00779	12737.5
Father Family 3	0.62074	0.09829	0.0069	4776.34
Father Family 4	0.38878	0.30558	0.07663	10668.3
Father Family 5	0.28527	0.13283	0.01122	12602.4

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Table 6 (continued)

Family Name	Correlation	Homogeneity	Energy	Contrast
Father Family 6	0.24496	0.09942	0.00586	13198.9
Father Family 7	0.26796	0.09576	0.00496	12397.9
Father Family 8	0.17604	0.23716	0.04574	13976.2
Father Family 9	0.18235	0.09667	0.0056	14135.8
Father Family 10	0.31856	0.12278	0.00866	11764.1
Father Family 11	0.33164	0.07266	0.003	10561
Father Family 12	0.43356	0.11487	0.00717	9707.24
Father Family 13	0.20745	0.21332	0.03817	13492
Father Family 14	0.27698	0.10274	0.00587	12115.7
Father Family 15	0.41315	0.12782	0.0094	10099.6
Father Family 16	0.45867	0.17988	0.02672	8268.57
Father Family 17	0.34794	0.33243	0.08421	11435.6
Father Family 18	0.31948	0.17505	0.02612	10850.2
Father Family 19	0.29359	0.11435	0.00783	12695.9
Father Family 20	0.38598	0.10953	0.00655	10375.1
Father Family 21	0.34267	0.09403	0.0055	10470.4
Father Family 22	0.30503	0.0856	0.00408	11438.4
Father Family 23	0.28931	0.09195	0.00483	11840
Father Family 24	0.23007	0.10011	0.00587	13007.3
Father Family 25	0.51341	0.13717	0.01081	8720.87
Father Family 26	0.29224	0.11531	0.00786	12613.3
Father Family 27	0.32194	0.11176	0.00749	11874
Father Family 28	0.33107	0.12882	0.00958	11832.3
Father Family 29	0.17874	0.10406	0.00643	14163.9
Father Family 30	0.2204	0.10348	0.00654	13918

Table 7
Ekstraksi GLCM 45° Mother.

Family Name	Correlation	Homogeneity	Energy	Contrast
Mother Family 1	0.43314	0.12979	0.00955	9958.1
Mother Family 2	0.46868	0.15786	0.01572	9347.97
Mother Family 3	0.54215	0.10266	0.00758	6050.51
Mother Family 4	0.17926	0.26625	0.05762	14406.3
Mother Family 5	0.51083	0.13629	0.01124	8708.89
Mother Family 6	0.42386	0.17491	0.02096	10556
Mother Family 7	0.29615	0.1012	0.00567	12067.3
Mother Family 8	0.43516	0.1735	0.02485	8540.53
Mother Family 9	0.32065	0.10717	0.00638	11874.6
Mother Family 10	0.25594	0.28823	0.06655	12854.8
Mother Family 11	0.40529	0.21205	0.0328	11168.9
Mother Family 12	0.24321	0.2957	0.07112	13416.9
Mother Family 13	0.19036	0.0781	0.00347	13139.8
Mother Family 14	0.24304	0.10922	0.00684	13201.7
Mother Family 15	0.28902	0.09831	0.0054	11848.1
Mother Family 16	0.21477	0.09928	0.00564	13320.3
Mother Family 17	0.30233	0.29686	0.07483	12726
Mother Family 18	0.54927	0.18894	0.02432	8399.1
Mother Family 19	0.17865	0.09395	0.00501	13947.7
Mother Family 20	0.17865	0.09395	0.00501	13947.7
Mother Family 21	0.29922	0.11411	0.00777	12136.3
Mother Family 22	0.23984	0.07797	0.00329	12287.8
Mother Family 23	0.28438	0.10638	0.00638	12329.3
Mother Family 24	0.22848	0.09338	0.00485	13189.3
Mother Family 25	0.21026	0.11146	0.00767	13750.5
Mother Family 26	0.21463	0.10123	0.00635	13604.5
Mother Family 27	0.25235	0.09812	0.00535	12857
Mother Family 28	0.1242	0.0883	0.00451	14776
Mother Family 29	0.11425	0.09897	0.00582	15344
Mother Family 30	0.31201	0.11106	0.00712	11633.6

Table 8
Child Fingerprint Extraction 90°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Child Family 1	0.66329	0.12532	0.00846	5872.69
Child Family 2	0.51127	0.21627	0.03542	9485.12
Child Family 3	0.62737	0.06088	0.00135	4270.93
Child Family 4	0.53817	0.36923	0.10014	8274.02
Child Family 5	0.58489	0.24906	0.0486	8101.48
Child Family 6	0.55834	0.15193	0.01471	7951.5
Child Family 7	0.65314	0.10412	0.00554	5786.68
Child Family 8	0.68137	0.09838	0.00501	5282.85
Child Family 9	0.55987	0.10552	0.00596	7485.52
Child Family 10	0.57583	0.15488	0.01554	7526.25
Child Family 11	0.4825	0.15283	0.0153	9626.01
Child Family 12	0.45965	0.08069	0.00341	8928.41
Child Family 13	0.52082	0.30557	0.07269	8295.17
Child Family 14	0.61918	0.10735	0.0063	6493.48
Child Family 15	0.45213	0.35422	0.10811	10450.4
Child Family 16	0.51819	0.11601	0.00772	8266.56
Child Family 17	0.59277	0.29208	0.07014	8043.64
Child Family 18	0.67824	0.17533	0.0201	5957.15
Child Family 19	0.6181	0.1116	0.00701	6472.31
Child Family 20	0.61241	0.14584	0.01315	6900.13
Child Family 21	0.63669	0.11742	0.00729	6087.11
Child Family 22	0.42197	0.09113	0.00458	9959.04
Child Family 23	0.58208	0.09928	0.00531	7153.9
Child Family 24	0.50505	0.12363	0.00906	8700.48
Child Family 25	0.56401	0.11425	0.00733	7513.92
Child Family 26	0.47005	0.09806	0.00548	8913.07
Child Family 27	0.47379	0.23554	0.04216	10275.8
Child Family 28	0.54232	0.20398	0.0308	8680.92
Child Family 29	0.56667	0.31403	0.08181	8620.64
Child Family 30	0.36166	0.11943	0.00921	11485.6

Table 9
Father Fingerprint Extraction 90°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Father Family 1	0.6499	0.11829	0.00762	6264.11
Father Family 2	0.66958	0.12357	0.00825	5710.21
Father Family 3	0.85674	0.17901	0.01538	1810.41
Father Family 4	0.6063	0.3742	0.10189	6869.93
Father Family 5	0.62972	0.14044	0.01172	6524.14
Father Family 6	0.6033	0.10679	0.00632	6930.11
Father Family 7	0.70662	0.11318	0.00662	4965.1
Father Family 8	0.57926	0.3549	0.08843	7134.23
Father Family 9	0.53455	0.1051	0.00632	8045.53
Father Family 10	0.62943	0.12444	0.00849	6395.92
Father Family 11	0.67846	0.09304	0.00408	5085.83
Father Family 12	0.61145	0.10555	0.00569	6658.08
Father Family 13	0.59751	0.31788	0.07674	6849.75
Father Family 14	0.58083	0.10576	0.00599	7022.49
Father Family 15	0.58879	0.11701	0.00768	7073.52
Father Family 16	0.57689	0.23086	0.03544	6474.14
Father Family 17	0.63242	0.42838	0.12654	6442.67
Father Family 18	0.64278	0.27203	0.05219	5698.34
Father Family 19	0.57345	0.11529	0.0075	7665.03
Father Family 20	0.59991	0.10398	0.00576	6758.71
Father Family 21	0.68853	0.10688	0.00641	4970.81
Father Family 22	0.60586	0.09021	0.00421	6488.34

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Table 9 (continued)

Family Name	Correlation	Homogeneity	Energy	Contrast
Father Family 23	0.43232	0.07996	0.00362	9449.9
Father Family 24	0.5611	0.10232	0.00582	7412.66
Father Family 25	0.60128	0.11658	0.00753	7137.8
Father Family 26	0.60359	0.11556	0.00761	7061.15
Father Family 27	0.58738	0.11386	0.00734	7225.64
Father Family 28	0.66862	0.12736	0.00926	5854.8
Father Family 29	0.56942	0.11299	0.00728	7418.97
Father Family 30	0.57075	0.10986	0.00688	7654.77

Table 10

Mother Fingerprint Extraction 90°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Mother Family 1	0.66835	0.12272	0.0085	5819.11
Mother Family 2	0.64711	0.1539	0.01441	6206.59
Mother Family 3	0.75344	0.15845	0.01624	3257.92
Mother Family 4	0.53868	0.37364	0.10057	8095.64
Mother Family 5	0.54952	0.11663	0.00825	8014.15
Mother Family 6	0.60932	0.17361	0.01966	7157.06
Mother Family 7	0.65806	0.1081	0.00656	5862.96
Mother Family 8	0.59317	0.21743	0.03371	6145.58
Mother Family 9	0.53597	0.10093	0.00562	8106.42
Mother Family 10	0.56284	0.38803	0.10505	7553.71
Mother Family 11	0.66032	0.21265	0.03129	6371.88
Mother Family 12	0.62823	0.42117	0.12492	6592.19
Mother Family 13	0.43015	0.08313	0.00369	9251.07
Mother Family 14	0.57709	0.11674	0.00756	7368.17
Mother Family 15	0.6082	0.10238	0.00554	6527.98
Mother Family 16	0.62694	0.10965	0.00672	6324.98
Mother Family 17	0.61429	0.3893	0.11646	7034.98
Mother Family 18	0.58983	0.17204	0.02026	7635.91
Mother Family 19	0.53396	0.09893	0.00541	7911.73
Mother Family 20	0.53396	0.09893	0.00541	7911.73
Mother Family 21	0.62467	0.12271	0.00851	6499.32
Mother Family 22	0.52516	0.0816	0.00339	7672.77
Mother Family 23	0.60953	0.1103	0.00643	6724.71
Mother Family 24	0.45303	0.09258	0.0048	9339.47
Mother Family 25	0.53064	0.11759	0.00797	8170.53
Mother Family 26	0.52494	0.10526	0.00641	8226.1
Mother Family 27	0.45288	0.09247	0.00476	9409.8
Mother Family 28	0.47413	0.09769	0.00547	8867.54
Mother Family 29	0.43667	0.10041	0.00588	9757.95
Mother Family 30	0.60203	0.11341	0.00717	6729.27

Table 11

Child Fingerprint Extraction 135°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Child Family 1	0.26818	0.11215	0.00719	12770.3
Child Family 2	0.22192	0.2092	0.03446	15111.1
Child Family 3	0.35102	0.03529	0.00054	7443.34
Child Family 4	0.23507	0.27884	0.06343	13710.2
Child Family 5	0.4136	0.24623	0.04853	11450
Child Family 6	0.25189	0.14423	0.01432	13476.1

(continued on next page)

Table 11 (continued)

Family Name	Correlation	Homogeneity	Energy	Contrast
Child Family 7	0.26355	0.08983	0.00441	12283.2
Child Family 8	0.32867	0.09282	0.00477	11134.1
Child Family 9	0.27424	0.10404	0.00617	12348.9
Child Family 10	0.30669	0.15368	0.01589	12303.5
Child Family 11	0.27061	0.15016	0.01549	13571.6
Child Family 12	0.32055	0.09071	0.00436	11218.1
Child Family 13	0.41157	0.27507	0.0631	10180.4
Child Family 14	0.4324	0.11713	0.00773	9683.29
Child Family 15	0.23763	0.29527	0.08107	14540.5
Child Family 16	0.42477	0.13287	0.01003	9874.9
Child Family 17	0.43727	0.28612	0.06899	11124.3
Child Family 18	0.6677	0.19486	0.02516	6150.44
Child Family 19	0.35581	0.10777	0.00689	10918.1
Child Family 20	0.38478	0.14664	0.01412	10953.2
Child Family 21	0.43399	0.11937	0.00813	9479.81
Child Family 22	0.22853	0.09293	0.00507	13298.3
Child Family 23	0.40585	0.10815	0.00656	10174.1
Child Family 24	0.36487	0.13285	0.01074	11172.9
Child Family 25	0.38917	0.12503	0.00874	10537.8
Child Family 26	0.36695	0.10958	0.00695	10640.5
Child Family 27	0.34622	0.2378	0.04442	12786.1
Child Family 28	0.33075	0.20027	0.03116	12700
Child Family 29	0.32862	0.31123	0.08248	13387.9
Child Family 30	0.21591	0.12414	0.01023	14107.5

Table 12

Father Fingerprint Extraction 135°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Father Family 1	0.46417	0.12987	0.00947	9589.08
Father Family 2	0.3867	0.12652	0.00914	10612.7
Father Family 3	0.6822	0.10764	0.00775	4002.37
Father Family 4	0.17745	0.24581	0.05006	14356.6
Father Family 5	0.45511	0.15063	0.01369	9607.66
Father Family 6	0.55401	0.13204	0.0097	7796.45
Father Family 7	0.11956	0.0846	0.00414	14911.5
Father Family 8	0.36421	0.28597	0.06524	10784.6
Father Family 9	0.3545	0.11387	0.00745	11159.5
Father Family 10	0.42882	0.13119	0.00964	9860.34
Father Family 11	0.49129	0.08606	0.00404	8038.06
Father Family 12	0.17133	0.08684	0.00417	14200.9
Father Family 13	0.43997	0.27169	0.05952	9533.69
Father Family 14	0.30701	0.10419	0.00605	11612.5
Father Family 15	0.21749	0.1056	0.0067	13467.3
Father Family 16	0.11443	0.11413	0.01156	13526.3
Father Family 17	0.36686	0.33668	0.08783	11103.7
Father Family 18	0.4741	0.20916	0.03723	8384.88
Father Family 19	0.30022	0.11846	0.00811	12576.7
Father Family 20	0.17802	0.0878	0.00431	13888.7
Father Family 21	0.43146	0.09953	0.00593	9056.13
Father Family 22	0.20218	0.07824	0.00327	13131.2
Father Family 23	0.14961	0.07809	0.00349	14168.2
Father Family 24	0.35821	0.10876	0.00684	10842.3
Father Family 25	0.25221	0.11206	0.00747	13402.2
Father Family 26	0.57704	0.14521	0.01216	7537.66
Father Family 27	0.42818	0.12146	0.00846	10013.4
Father Family 28	0.38919	0.13176	0.00994	10804.1
Father Family 29	0.39031	0.12911	0.00923	10515
Father Family 30	0.48569	0.13394	0.00963	9181.76

Table 13

Mother Fingerprint Extraction 135°.

Family Name	Correlation	Homogeneity	Energy	Contrast
Mother Family 1	0.37402	0.12273	0.00866	10996.6
Mother Family 2	0.21242	0.13209	0.01167	13856.4
Mother Family 3	0.60318	0.12535	0.01088	5244.04
Mother Family 4	0.34425	0.31249	0.07701	11510.4
Mother Family 5	0.28795	0.11782	0.00838	12676.8
Mother Family 6	0.26268	0.15954	0.01784	13509.2
Mother Family 7	0.49051	0.12029	0.00803	8735.03
Mother Family 8	0.36339	0.15133	0.01834	9626.01
Mother Family 9	0.22665	0.09693	0.0053	13517.4
Mother Family 10	0.45821	0.34447	0.0908	9360.24
Mother Family 11	0.44088	0.21409	0.03371	10500.4
Mother Family 12	0.42761	0.34714	0.09555	10147.7
Mother Family 13	0.32837	0.08954	0.00449	10900
Mother Family 14	0.50507	0.13748	0.01068	8631.46
Mother Family 15	0.29065	0.09886	0.00547	11820.9
Mother Family 16	0.48178	0.12695	0.00893	8790.66
Mother Family 17	0.37503	0.31571	0.08291	11400
Mother Family 18	0.36874	0.17197	0.02058	11763.3
Mother Family 19	0.34183	0.10978	0.00657	11176.9
Mother Family 20	0.34183	0.10978	0.00657	11176.9
Mother Family 21	0.49586	0.13507	0.01043	8730.83
Mother Family 22	0.22168	0.07645	0.00306	12581.7
Mother Family 23	0.33037	0.11065	0.00679	11537
Mother Family 24	0.3461	0.10589	0.00631	11178.4
Mother Family 25	0.34132	0.12344	0.00915	11468.4
Mother Family 26	0.31047	0.11082	0.00739	11944.4
Mother Family 27	0.28679	0.10259	0.00606	12265
Mother Family 28	0.35214	0.11058	0.00683	10930.3
Mother Family 29	0.37856	0.12161	0.00845	10765.2
Mother Family 30	0.2254	0.10301	0.00616	13098.1

Ethics Statement

The local government has approved to carry out this research. All participants involved in fingerprinting had given their consent to participate in this research.

CRedit Author Statement

Lalu Darmawan Bakti: Conceptualization, Methodology; **Bahtiar Imran:** Software, Validation; **Erfan Wahyudi:** Formal analysis, Investigation, Resources; **Dwinita Arwidiyarti:** Data curation, Writing - original draft; **Emi Suryadi:** Writing - review & editing, Visualization; **Muhammad Multazam:** Project administration, Supervision; **Maspaeni:** Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests, commercial, associative or personal relationships that could have appeared to influence the work reported in this paper.

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