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Improving Fingerprint Sensor Interoperability using Sensor Agnostic Image Transformation

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Motivation

- Sensor technologies introduced their own distortions and variations in the fingerprint image
- Matching fingerprints collected from different sensor technologies increases error rates
- Goal is find a sensor agnostic method of normalizing image

Fingerprint Data

- Fingerprints collected from 190 subjects using 9 different fingerprint sensors

Thermal Optical Capacitive

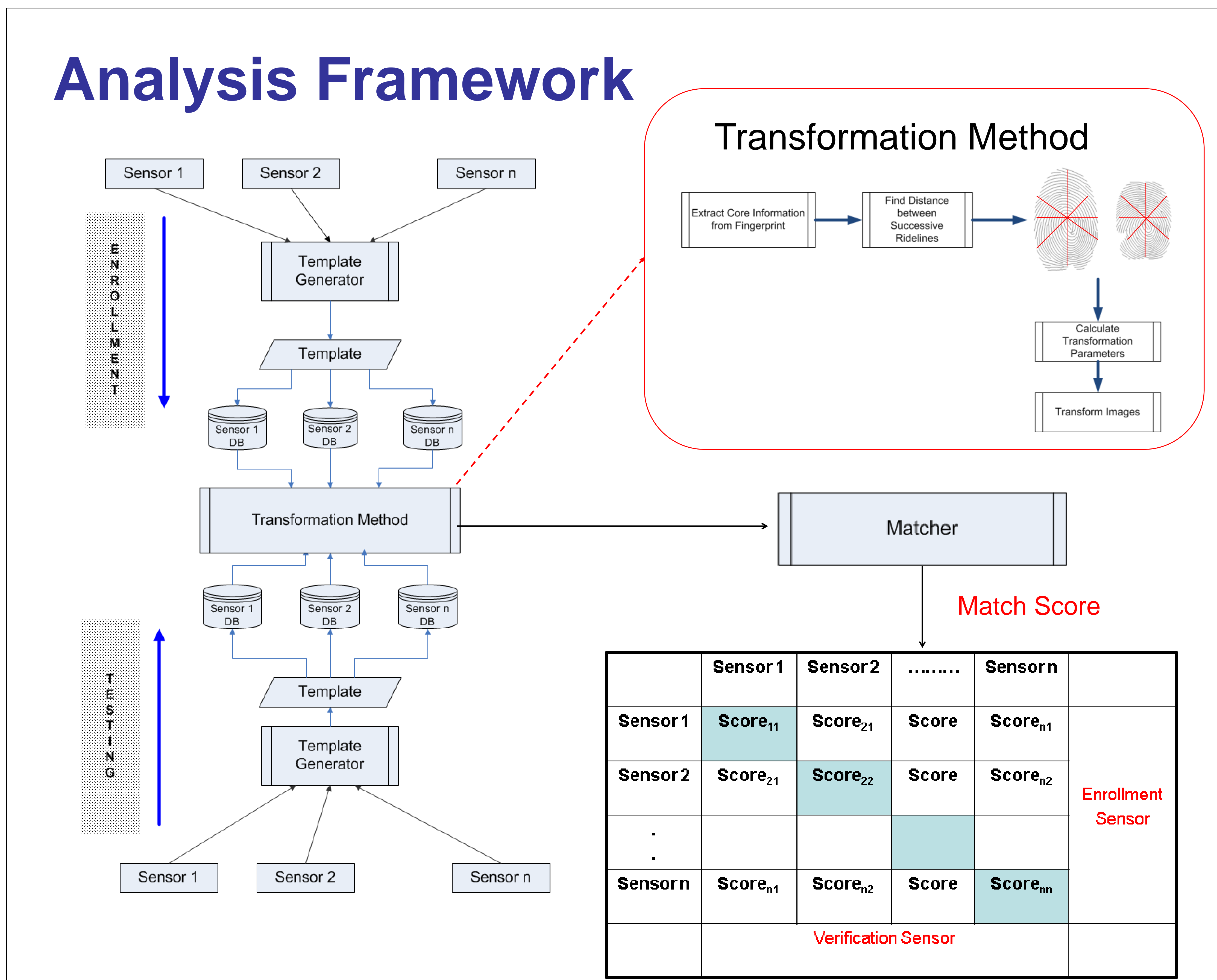


Original Results

- False Reject Rates for comparison using original non-normalized fingerprints

		TEST							
		S1	S2	S3	S4	S5	S6	S7	S9
E N R O L L	S1	0.47	6.79	5.60	4.44	5.61	31.03	11.30	3.76
	S2	7.33	5.05	6.49	7.44	10.92	16.18	10.83	6.11
	S3	8.57	4.78	0.24	1.07	1.28	2.73	1.79	0.54
	S4	5.10	4.44	0.95	0	1.39	1.60	1.83	1.08
	S5	5.56	7.64	0.85	0.85	0.78	4.42	2.23	0.42
	S6	33.86	13.42	2.99	1.30	4.47	0.17	1.41	2.15
	S7	14.92	9.89	1.73	2.12	2.35	2.71	0.94	1.85
	S9	2.87	2.96	0.12	0.90	0.49	1.73	0.77	0.11

Analysis Framework



Future Work

- Generate performance results for transformed fingerprint images
- Calculate linear transformation parameters and polynomial transformation parameters
- Explore methods for normalizing non-linear distortion at the edges of fingerprint images