Rule of Thumb: Prints Beat DNA

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Summary

We distinguish thumbprints by their global features (those that can be easily detected by the naked eye): the thumbprint's pattern, the ridge count, and the type lines. With this model, the probability that two thumbprints have the same global characteristics is at least 5.02×10^4.

In a second model, we pay more attention to local features (those not easily detected by the naked eye), in particular the thumbprint's minutiae. We look at the number of minutiae, their location, and the direction in which their corresponding furrow endings point. With this stronger model, the probability that two thumbprints have the same local characteristics is approximately 6.41×10^{-143}.

With both models, we estimate the probability that every thumbprint in the history of mankind is unique to be virtually zero (though this contradicts what our logic dictates).

Since identical twins share the same DNA pattern, the probability that every DNA strand in the history of mankind is unique must be zero. Given two DNA strands taken at random from people the probability that they are similar is approximately 8.29×10^{-14}. Since this probability is significantly more than the analogous probability for local thumbprint features, we conclude that DNA testing has a higher rate of misidentification.

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