

## A Matter of Standards

We are aware that the application of numerical standard is often presented as a caricature. Those who (still) apply them are by some regarded as backwards and having missed the sign of the times.

Our choice for the use of a numeric threshold is a however a conscious one and blends in with our complete and well defined method. We know about third level detail the development of ridges and pores and their uniqueness. We believe that is the combination of the configuration of the Galton points and the rare organic features which makes fingerprint evidence so strong and standing out. I often use the analogy of Google maps and Google satellite in which an organically developed city (not Manhattan) represents a fingerprint. The map is second level detail and the flow of a river, trees and shapes of houses represent third level detail. But the axiom of uniqueness does not resolve the issue of establishing the weight of the evidence and sufficiency. Those are two different topics.

Next we have concerns about the consistent reproduction of uniqueness of third level detail in prints and are inclined to be prudent because of chance based similarity. The application of ridgeology has a distinct risk of a picking attitude; i.e. embrace everything you like and ignore everything you don't. That was our view long before Mayfield occurred. On a side step, I question the use of third level detail using 500 DPI compressed images of reference fingerprints all together.

Back to the issue of standards.

I assume that most experts agree that an opinion of identification can be rendered if we have met a level of sufficiency. I assume we also agree that the analysis of fingerprints is a quantitative and qualitative based process. The problem is how we define sufficiency and how we establish it in practice.

Our numerical part of the Netherlands standard is 10 to 12. We are allowed to make a full identification if we found 12 Galton points we agree upon (within the multiple procedure all three experts) or 10-11 Galton points if and when there is extra, similar information of a fingerprint nature. This could be similarity in ridge detail and most of the times it is. For all the individual points it is established that they are present, in agreement and significant. In this manner we operate in close agreement with the early ideas of Locard.

Yes we look at ridge detail, flow of the individual ridges, pores etc. and incorporate this in our judgment for the weight of the individual points and the total weight. Those who are interested in more detail are invited to look at the Interpol website for the documents of the IEEGFI I and II working groups which reflect what we do and how we do it.

<http://www.interpol.int/Public/Forensic/Fingerprints/WorkingParties/default.asp>

We do not identify because we have found sufficient points, only after we have found that sufficiency criteria are met both with respect to quantity and quality. Does a fixed standard have arbitrary aspects? Yes like any standard it has. But I regard a system applying a personal standard on a case by case basis as an arbitrary system. In my view a personal standard is an oxymoron. (like; pretty ugly or Microsoft works)

I note that in discussions a standard is often confused with an SOP. (Merriam Webster; Standard; something set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality )

The function of a standard is to secure the solidity of the conclusion that is based upon it. So far we are confident our standards have contributed to that although I will never claim infallibility.

Does the standard have a scientific basis? No, it has not, and we have never claimed it to be so. A standard is a practical instrument with a sensible purpose and valid basis. I would like to refer to many standards in use in many scientific disciplines, those who are interested could read the transcript of Dr John Thornton's presentation; "Setting Standards In The Comparison and Identification" that can be found here; <http://www.latent-prints.com/Thornton.htm> The question could also be inverted to; "does the use of a non-numerical standard (or an holistic approach) have a scientific basis ?"

There are many benefits for the use of this type of standard which are described in the IEEGFI report nr. 1, under "the Empirical Standard Approach", so I will not list them here.

In discussions about this subject we are sometimes confronted with the reproach that we "fail" to make an identification even if we feel, or are personally convinced, "it's him" So we are blamed for missing identifications and ignoring valuable evidence. I will separate these two hereafter.

First I will address identification. If we accept that we need to reach a level of sufficiency (no matter how it is defined) before we can identify then there will be cases where the mark is insufficient to. So in any system this situation can occur. If this is ignored or ironed out the gut feeling or conviction has become the basis for our identifications rather than standards and procedures. We observe a perfect circular reasoning, " you must identify it because you know it's him"

This is like; Johan Crujff is the best soccer player of all times because he was the best. (Which of course he is, how could anyone ever question that!)

In any case, no matter how low or how high the standard is, there will be marks floating around the edge and experts will have different opinions upon them. If this occurs is the expert concluding to insufficiency bound to give up his personal standard too?

The reproach that identifications are missed is based upon the premises that we know the donor but we fail to identify him. Since we do not know the ground truth this reproach is unscientific by nature.

An interesting question remains however; Is the number of identifications affected by the application of different standards and how? We have once estimated that, based upon the number of drop outs in the multiple procedure, there is a potential of 0,2% of investigated cases that fail the standard and could have a different outcome by applying a lower standard.

Bruce Grant from NSY presented the first figures based upon the experiences with the change to the non numeric system at an Interpol conference in Lyon in 2003. He announced that they had increased the number of identified cases with slightly less than 0,1% as a result of the introduction.

The "extra" identifications only exist if and when in general the "personal standard" is lower than 10. This is an assumption of which we don't know it is true either. There may be significant fluctuations between experts and even with the same expert over time for example when look a likes or misidentifications are encountered.

We have experiences with cooperation between “numeric’s” and “non-numeric’s” in collaborative exercises and with the exchange of staff in both directions. We have found that the differences in practice are small; in fact we experience more commonalities than differences. In working together with a “ridgeologist” I once got the spontaneous reaction; “you are no point counter at all”. I replied; “I know, please tell the rest of the world”.

A different subject is that valuable evidence is supposed to be lost by applying some kind of sufficiency threshold, dividing marks in “of value” and “of non value”. This reproach is generally voiced by the scientific community outside fingerprinting and may have been true in past times but is handled differently in our operations for quite some time now.

If it is required and beneficial for the investigation of a case in court we would report the findings of a multiple procedure even if a comparison fails to meet the standard. We think we cannot and should not keep this from the court. What we would report is that we have compared the mark in question with a fingerprint from subject X; that we found similarities that did not meet the standard of sufficiency; that no discrepancies were found and that we thus cannot eliminate the investigated person as the possible donor. We would also indicate that we are aware that we are operating in the danger zone (with respect to chance look a likes) and that a reliable instrument to objectively assign weight to the found similarities fail. Since objective and empirical data are missing any opinion provided would be speculative. Even if someone, hypothetically, would provide such an opinion, reproducibility of it could and should not be pretended. Still the conclusion that a person/donor cannot be excluded can be used in the proceedings as information this to the discretion of the court.

The Netherlands Forensic Institute in cooperation with our department has developed a probabilistic model to evaluate the weight of the evidence using the configuration of Galton points. Starting September this year we would be able to put these insufficient marks in the model and to provide an objective weight to the equation in its context.

This is in agreement with the position from the IAI as presented at the annual conference in 2010.

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