# Just Using Inadvertently Photographed Ridge Detail as Evidence.wav

**Introduction** [00:00:01] RTI International's justice practice area presents Justice Science. Welcome to Just Science, a podcast for justice professionals and anyone interested in learning more about forensic science, innovative technology, current research and actionable strategies to improve the criminal justice system. In episode two of our case studies Season Just Science sat down with Tim Fayle Training Capability Lead for IDEMIA Australasia and Chair of the International Association for Idenifications Latent Print Certification Board to discuss the utility of friction ridge detail inadvertently captured via photographs as a valuable and potentially underutilized type of evidence within a variety of case types. While the use of latent fingerprints recovered from crime scenes has been established as an important type of forensic evidence for decades, the increasingly widespread use of social media and other digital platforms has contributed to even more opportunities to garner friction ridge detail evidence following a crime. Practitioners and researchers alike have demonstrated the value of utilizing photographs, presenting inadvertently captured finger and palm friction ridge detail obtained via social media posts, other digital forums and cellphone data to identify perpetrators and help bring justice to victims. List along, as Tim described several cases where inadvertently photographed friction ridge detail was utilized to make an identification to a perpetrator. The various methods and techniques latent print examiners can add to their toolkit to analyze and compare this type of friction ridge detail and his recommendations for ensuring this type of evidence is not overlooked or underutilized within future cases. This episode is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Some content in this podcast may be considered sensitive and may evoke emotional responses or may not be appropriate for younger audiences. Here's your host, Mikalaa Martin.

**Mikalaa Martin** [00:01:53] Hello and welcome to Just Science. I'm your host, Mikalaa Martin, with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. On today's episode, we will discuss the utilization of ridge detail inadvertently captured and digital evidence, which is becoming increasingly more common due to the widespread use of social media. Joining us today to discuss this type of possible identifying evidence and its application and a variety of modern day and cold case types is Mr. Tim Fayle. Welcome to Just Science, Tim. Thank you for sitting down with us today.

**Tim Fayle** [00:02:30] Thank you, Mikalaa And thank you for having me.

**Mikalaa Martin** [00:02:33] Of course. So, Tim, I would love to kick off today's session and episode with you sharing a bit about yourself and your journey to and through the discipline of forensic science.

**Tim Fayle** [00:02:44] Yeah, certainly. I've had a bit of a varied experience, shall we say, multiple countries, as you can tell from my accent, I'm from Australia originally. I started in forensics doing a forensic science degree at the University of Technology in Sydney in Australia. I then started working for the New South Wales Police, initially as a Scene to Crime Officer, which is basically a CSI. I did that for a couple of years and then moved into fingerprints in 2005. Again, my expertise in Australia in 2009 also got IAI certified, which is International Association for Identification, Certified Latent Print Examiner Certification, and in 2012 decided with my family to make a bit of a big move and shifted over to California to the Santa Clara County Sheriff's Office in San Jose. So again, as a fingerprint examiner there, I became director of the fingerprint unit there called the Sheriff's Identification Unit and stayed there for just shy of ten years. And right around the tail end

of COVID times, we decided that was the perfect opportunity to move our family back to Australia because, of course, travel was so easy at that time. So we did get to experience a 747 flight with ten people and four of them being my family back to Australia and then two weeks in a quarantine hotel, which was, shall we call it, a life experience. And then after moving back to Australia, I began working for IDEMIA as their Training Capability Lead in Australia. We had a major upgrade to the National Automated Fingerprint Identification system here in Australia, and I was responsible for training all the examiners in Australia on the new system. So that's kind of my short bio.

**Mikalaa Martin** [00:04:21] That is quite the international journey. Lots of the forensic ecosystem that you've experienced from the practitioner side to the vendor side, so that's great. I know that you mentioned the International Association for Identification, so the IAI. So you're currently the chair of the latent print Certification Board. Can you tell us a bit about your role in the primary aims and objectives of the board?

**Tim Fayle** [00:04:45] Yes, certainly. So the board is responsible for maintaining the latent print certification program for the IAI. We're responsible for creating new testing materials, ministering the tests, marking the tests and maintaining certification registries. We also currently are in the midst of all the certification programs for the IAI and not just the latent print one. Getting the program accredited as well. So as for anyone who's been through an accreditation at an agency, there's a lot of background work with that. So those are the main responsibilities. I've been on the board since 2015 and I've been chair of that latent print cert board since 2019. So I'm in my second and final term as, as chair. It's been very fulfilling professionally. It's it's wonderful to give back. It's a lot of work, as anyone who's on the cert board will tell you. But very rewarding work, I would say at that, too.

**Mikalaa Martin** [00:05:40] So speaking of the IAI, you recently presented a lecture at the IAI's Forensic Educational Conference entitled Social Media Fingerprints and Other Inadvertently Photographed Ridge Detail. Can you provide an overview of this lecture for us?

**Tim Fayle** [00:05:55] This lecture was actually I first gave it in 2015 at the Centennial Conference in Sacramento, and it was after my kind of first case dealing with this kind of evidence. And really, it's targeted at evidence that perhaps some examiners are still unaware of. I would hope that more and more examiners are more and more familiar with it as we progress now on to 2024. It's a type of evidence that you could receive in your day to day work. It's a type of evidence that often detectives either don't know about, don't know the possibility for use, aren't even thinking in that space. And so my idea was just to sort of raise some awareness. So as well as the case I worked on and I presented on some other cases that I found that were published in 2015, it was slim pickings. There were only a very small number that I could find, man, that we'll talk about throughout this, who's done quite a bit of research in this, Shane Turnage out of Canada. He was one of the few who had done some research in this work. The case in this kind of evidence sphere. It was really just to sort of raise awareness with people about, hey, this is actually a kind of evidence that you could receive. It's not controlled, but you need to know how to deal with it when you get it. That's kind of the realm of what I was targeting. Now. I was looking, as always, with any lecture for a what you might term a sexy title. So social media fingerprints are so certainly quite good. However, I also found that it didn't really capture every type of a circumstance that this type of evidence could happen. So as well as photographs of friction ridge skin that might appear in Facebook, Instagram, other social media posts, it also include inadvertently captured detail in, say, like a photograph on a phone that's been seized in a search warrant. So I don't know that my title of the talk is it's

a bit of a mouthful in the end. And you know, the UK, when they decided to talk about it, just called it digital friction ridge detail, which is probably a lot easier to describe, but that's essentially the building blocks of the talk. And then the talk that I gave this year at the conference was just an update. So I had some more recent case work that was in there in those years. In between, I've also created an online course and just sort of giving an update. There's also been a validation study out of the UK, which was a really important extra step in working this sort of evidence.

**Mikalaa Martin** [00:08:13] Awesome. And the year that stuck out to me. So 2015, would you say that that is kind of the year that all of this started to emerge or at least become discussed within the community?

**Tim Fayle** [00:08:23] I mean, certainly for me, as I mentioned, there were a few people who had raised some awareness about it before Shane Turnage in particular out of Canada. Chris Crisis as well had published about a case that he'd worked on. But for me, my introduction to it was really around 2015 because that was the first case that I worked. And that case at Santa Clara County Sheriff's Office we have had a number of police agencies that would submit evidence to us, and one of those being Los Altos Police Department. And I got a call from a detective one day who said he'd found suspect for a series of burglaries that had self incriminated himself on some Instagram posts, basically just bragging about the proceeds of the crimes and everything. But the Instagram account had been set up anonymously so he couldn't trace who had set it up. But in trawling through some of the posts, he found a photograph and he said, Hey, I've got a photograph of that guy's hand. I'm just wondering if you'd be able to identify the guy from his handprint. And it's in this photograph. So for the fingerprint examiners listening in, he said, it looks really good. It's really good quality. So the fingerprint examiners listening in, I'm sure you've heard that before, where your hear it looks like really good quality to me and then you get it and it's terrible. This was not that case. This one. He sent me the image and I immediately said, Yeah, I think we can do something with this. It was a photograph. He was actually trying to sell drugs as well, and he was holding a pill in his hand, which turned out to be a clonazepam pill. That pill, just from the markings on it, on Drugs.com. I could figure that was a clonazepam pill which had a diameter of eight millimeters. So conveniently enough, he placed a scale on his hand to allow me to scale that accurately, to scale as well. Searched it in an automated fingerprint identification system, or AFIS, and got a hit to a person, provided the information after we got the identification verified to detectives and he was able to go and investigate that lead actually recovered some stolen property from that suspect that when I went around for a search warrant on his house. So that was kind of my first introduction into this sphere. That same year was when I first gave the talk at a conference and sort of triggered my interest in looking into this type of evidence.

**Mikalaa Martin** [00:10:28] Awesome! And you mentioned that there were a couple additional cases that you had spotlighted in your presentation this year that also came out kind of prior to that 2015 date. Maybe after that 2015 date, would you be able to talk a little bit about those additional cases as well?

**Tim Fayle** [00:10:45] So there had been some published in Evidence magazine. Chris Gross, I mentioned, had published a case that he had had that was a search warrant photograph where a suspect who was not allowed to possess firearms was holding a gun in a photograph and was able to identify the person from that. Some of the more recent ones that I talked about in the talk at this conference, there was one that probably a number of latent examiners may recognize from 2018 on chat forum called CLPEX.com. A

photograph was posted that site saying, Hey, every examiner, can you search this? We need to know who this person is. And essentially, they were sexually abusing a three year old girl and there was a photograph of some abuse and some ridge detail of an index finger was visible in in that photograph. These images had been uploaded to a dark web forum that pedophiles obviously liked to frequent and so detective had found it, had sent it to some examiners. They did not get any identifications from their searches. So they thought, well, let's try everything we can, because this was a particularly heinous criminal who had done a lot of very bad things in the pedophile sphere for a very long time. And so it was posted to this chat forum. So a lot of examiners will probably, if they were to to see the image again, they'd say, I recognize that I searched that back in 2018. So when the guy was eventually arrested, everybody got reverse hits. That was in 2019 when he was eventually arrested. So they did end up tracking him down by other means. And but everyone got reverse hits on it after the arrest. But that was one that a lot of people would probably be at least somewhat familiar with because of the posting on that forum.

**Mikalaa Martin** [00:12:21] I appreciate you sharing these two case studies, Tim. I find that they demonstrate the utility of this type of evidence and a variety or spectrum of case types. From these two case studies alone, it sounds like this type of evidence can prove to be recoverable and valuable in any case that contains digital evidence. So in your response, you also specifically called to any fellow latent print examiners who may be listening in today. For that audience, what are the main takeaways for modern day latent print examiners? Does this type of evidence bring about the need to expand the toolkit of traditional analysis and examination techniques?

**Tim Fayle** [00:12:59] I personally think so. First of all, awareness, as I've mentioned a few times, awareness is the key. So just being aware that this type of evidence exists that you can use it, you can get identifications from it, and these images are not to set up where the person is placing a scale on their finger and photographing their finger with the purposes of having it identified. So it's very different to, for example, a live scan capture of a fingerprint where it's a controlled environment, right? It's controlled with the capture of that. It's a known scale. In these images. You don't have a known scale. So having the awareness about the type of evidence, having the awareness about how to use this type of evidence as well. So, I mean, if you have a suspect, a 1 to 1 comparison is fairly straightforward, but not all the time. Sometimes the ridge detail is not facing the camera. Matter of fact, that happens quite a lot. And so it could be trailing away in one direction or another. And so being able to understand the techniques that are available to be able to correct that perspective issue, that that's present in the image so that you can make a 1 to 1 comparison. And then if you don't have a suspect or if the suspect is not identified, being able to search that in an AFIS system effectively and accurately with an accurate scale is critically important. So knowing how to scale the image correctly, how to know that you are within the tolerance that exists for being within correct scale so that you know that your search has been accurate to hopefully obtain an identification. If a person in the database that you are searching, those tools are very necessary. I would also say even further than just the analysis of evidence is the knowledge set to be able to have a conversation with detectives and even other investigators. So like you, CSI, who are at a crime scene or get a search warrant who come across something like this so that they know when they come across this type of evidence that it is the type of evidence that can be submitted to the fingerprint unit and can be useful in the investigation. I think those aspects are really important today's age as well.

**Mikalaa Martin** [00:15:02] You mentioned the importance of scaling quite a bit in that first key takeaway. And so to tie this back to the first case study you highlighted today, what's

fascinating to me is the out of the box thinking to look up the diameter of the clonazepam pill as a way to scale the image with this concept of ridge detail in informal or inadvertent photographs where a scale is likely not included or maybe is included in a nontraditional way. What methods can latent print examiners employ to recalibrate the image to correct the scale?

**Tim Fayle** [00:15:33] I've narrowed it down to three major ways to do that, and the first one is kind of what we discuss with the clonazepam pill. So if in the image there is a an object with a known size and it's in the same or very close to the same plane as the ridge detail, then that known object size could be used to to recalibrate your image to scale. So a good example being that pill. Another example being the case of crisscrosses that I mentioned earlier, where the gun was being held by the offender. That gun, you could tell from the markings what make and model the gun was and any make and model known of the gun you can look up the sizing of the various parts of that gun as well. So so that is one way. So a known object within the image. But but the key there is it's got to be close to the plane of the ridge detail that you're targeting. Otherwise you scale is not going to be accurate. The next way is, is a way that Shane Turnage has published on and it's using average hand dimensions and these so he's published on and he's got a nice cheat sheet available for it where it's got average sizes of each of the flanges, each of the sections of palms. So using that, it may not be super accurate, but what I have found through my research and others have found through their research is that AFIS systems have a pretty high tolerance for error margin in accuracy of scale, to the point where I found there were only issues if the scale was out by plus or minus 20% out of correct scale. That was when I started to see a negative effect on the AFIS searches. So there is quite a decent error margin built into AFIS systems and the searching algorithms with accuracy of scale. But obviously with that in mind, you want to be as accurate as you possibly can be. That's the second method is by average hand dimension size. And then the third way is by a ridge count. Espouse book, quantitative and qualitative. I forgot the exact title, but most people note is as the QQ book. His book talked about the average width of friction ridges, and so you can use that information to do a ridge count of I would say you want to target a minimum of ten ridges and preferably 15 to 20 if you have that many. They should be parallel ridges and preferably with as few ridge breaks as possible. So as few bifurcations and ridge endings breaking up the flow of the ridges as possible. You obviously want to avoid curved areas as well. So straight parallel ridges if possible, getting a ridge count and then using that spells average width to figure out the size and the scale from that. And I've had very good success with that as well. So those are kind of the three methods that could be used to recalibrate an image to scale in this circumstance.

**Mikalaa Martin** [00:18:18] And going back to that first option, you mentioned the importance of plane. So how can latent print examiners adjust perspective for ridge detail on a non perpendicular plane?

**Tim Fayle** [00:18:29] There's a number of different options there. And Photoshop is hopefully a tool that most examiners are familiar with and have available to them. If Photoshop is not available. There are some tools in other programs. I'm less familiar with those, but I do find the ones that I've seen they tend not to be as powerful is or is as good with this particular issue as the Photoshop tools are. So the three kind of tools and they kind of in order of ease of use, but also the harder they are, the more powerful the tool is as well. It always seems to be the way, right? Like you would love for a tool to be both powerful but very easy to use. But it's not always that way. So there's one called lens Correction in Photoshop, which is a very simple one where you can just basically correct the horizontal or vertical perspectives. Kind of like if you think about rotating a globe, it's

that kind of thought to it. The reason it's in Photoshop is to correct any distortion from know. For example, if you've used a fisheye lens and objects are distorted in the image, you can use that lens correction to just kind of help correct for that. That's the purpose of it in Photoshop. But it can be useful for these circumstances to correct perspective. The next one is perspective crops. So this is in the crop menu of Photoshop and it's called Perspective Crop. And you can basically create a crop you are going with the angle that your friction range detail is on. And then when you click the tick, it will take that angle and make it on a straight plane. The biggest problem with that one is you can't really see the effect of your perspective crop until you click that tick. So there is no like previewing of it. So it is a little trickier to get used to that one, but a bit more powerful than the lens correction. The last one is unfortunately in Adobe's infinite wisdom they have stopped using the 3D space in Photoshop after version 22 of Photoshop, so I've always highly recommended to turn off your auto updates to Photoshop if you want to use this particular function in Photoshop. You can even have like an older version of Photoshop and the newer version of Photoshop loaded on your computer at the same time. If you have enough disk space, I guess. But it's a filter, it's in the filters menu called Vanishing Point and Vanishing Point allows you to rotate either an entire image or a section of an image around the X, Y, and Z in an Australian or Z axes and not only rotate, but you can also compress or expand on those axes as well. So as well as being able to correct the perspective around to to being much more two dimensional, which is obviously what we're looking at with a live scan or ink to capture fingerprint. So as well as correcting that perspective, you can also correct the unnatural expansion or contraction that will happen when a fingerprint or friction ridge detail is out of correct perspective. So usually if the print is tailing away from the camera, the ridges will be compressed in that area that's tailing away from the camera. And if it's sort of angled more towards the ridges will be more expanded compared to so shall we call it normal compared to a two dimensional capture. So being able to correct for those issues, you can preview what you're seeing when you're using that 3D space. As I say, the biggest problem is unfortunately Adobe has done away with the 3D space in Photoshop after version 22, so if you want to use that particular tool Version 22 is it for you! Those are the three main ones I have actually started investigating and another tool called Perspective Warp, which is available in Photoshop as well. I'm kind of in the early stages of looking into the capability with this particular type of evidence in mind. I'm still in the very early stages there, but if someone wants to have the play around with Perspective Warp as well, my initial look at that seems fairly promising.

**Mikalaa Martin** [00:22:12] And maybe we'll hear about it at next year's IAI.

**Tim Fayle** [00:22:16] Yes, I would hope I can do an update there. Yes.

**Mikalaa Martin** [00:22:18] In keeping with the theme of overcoming challenges and preparing this type of evidence for latent print analysis and comparison with the need to compare social media and other inadvertently captured fingerprint evidence to two dimensional known exemplars. Is it safe to assume many times friction ridge detail is not captured in the two dimensional aspect?

**Tim Fayle** [00:22:40] Almost always that's the case. The times where it is captured in a two dimensional aspect is and there is a case out of Australia which is a really good one of this, where again, it was a very boastful sort of enterprise by the criminals involved here. They had committed an armed robbery, they were waving a gun in front of the camera. They were smart enough not to put their face in front of the camera. They had a whole bunch of cash on the bed, you know, kind of waving the gun in front of the camera and the light in the room as the gun was being waved in front of the camera. If you pause the still

of the video, the light shone on the gun at such an angle that you could actually see a latent fingerprint on the gun because it was a shiny metal. So that in that case, that's a two dimensional print, right? Because it's a latent print as opposed to friction ridge skin. That was a pretty cool case as well because they were able to calibrate that one to scale via ridge count and search it and get an idenification from that print on the gun. But I would say that two dimensional example that I gave would be the exception rather than the norm. It is almost always the case that you're looking at friction ridge skin with this type of images and therefore it's going to be three dimensional.

**Mikalaa Martin** [00:23:48] And how can that be corrected by latent print examiners in the non oddball cases of having a 2D print?

**Tim Fayle** [00:23:56] First of all, the accurate recalibration, the scale is very important. But second of all, why that vanishing point filter in Photoshop in particular is so powerful. Because it allows an examiner to not only correct perspective if the ridge detail is tailing away in one direction or another, but as well as that correct the compression or expansion of ridges so that the print appears much more like a two dimensional capture of the same ridge detail would appear. And that's ultimately the goal, right? If we can get the three dimensional friction ridge detail image to appear much more like a live scan or inked captured ten print, two dimensional print is of the same person, well then we're going to have a much higher success rate and accuracy with searching that print and being able to identify it. That's ultimately the goal and the ability to correct for those distortions really mainly around accurate recalibration to scale and correcting perspective in the image.

**Mikalaa Martin** [00:24:56] So I'd like to talk a little bit about enhancement to latent prints and inadvertently capture friction ridge detail. So for the techniques that are used, are they different from traditional approaches to enhancements made.

**Tim Fayle** [00:25:09] Aside from things like the perspective corrections I would say not really. It's just applying what hopefully examiners already aware of to the situation. So hopefully examiners are familiar enough with the color wheel and with being able to use like lightens like an opposite will darken. And obviously there's the fluorescent aspects to color, but that's generally not what we're dealing with here. So, you know, being able to use a like color, you know, skin color has a very specific tone in certain races. So it tends to be in a specific area of the color wheel and then either using a like color to lighten that area, if that's what you need to do in your image or dark and out with the opposite color, those are kind of the main sort of enhancements. Other ones that I found very useful again in this sort of Photoshop sort of sphere. If people don't have these sort of enhancements available in their AFIS system would be things like curves, which are great with pretty much any image really, and also levels. In my online course I talk about a specific way of using levels where you can actually target and see what you are removing from the image so that you can avoid removing any ridged detail information. And that's achieved by holding the alt key in when you slide the minimum and maximum bars of levels.

**Mikalaa Martin** [00:26:28] And one other thing I'd like to talk about is in this era of heavy use of social media times, a lot of times we see photographs that are altered by the poster via filters or even the application of artificial intelligence. Does the use of this type of technology lead to any challenges or considerations for this type of evidence?

**Tim Fayle** [00:26:49] Yeah, certainly. One of the areas that examiners really need to be aware of is is control of the audit trail of your images. And then, you know, that should be a standard practice with any type of evidence, right? Regardless of the evidence. With this

type of evidence it's the images that especially if they've been posted to social media, those social media sites, all the ones to my knowledge, there is some level of automatic processing that the social media site applies to any image that's uploaded to the site. Usually it's a compression so that they limit how big the file sizes are that are being loaded on the site for fairly obvious reasons there. But yeah, things like filters obviously available, whether they're on the camera itself of a particular phone or they could be in a software application. You know, Snapchat is famous for having a lot of filters or even the social media site itself might have some filters that you could load it with. So you load an image and you say, I want to apply this filter to it. So those filters, though, by and large, will leave traces in the metadata. So they will be traceable. And the key with this type of evidence is controlling the audit trail for the moment you can, which you can't control from the moment of capture. Obviously. But from the moment you receive it, you can. And so having that audit trail controlled from that moment, and then if there's any question about any alteration that might have happened to an image before you got it, hopefully there would be traces in the metadata. So being able to have the metadata analyzed in those circumstances as well would be important. But it's obviously a concern with this type of evidence. There is a possibility that, you know, an image could be modified before it's posted and some sort of effect to the ridge detail has happened in that case. I would also say for those who have been fingerprint examiners long enough, that type of modification, without leaving an obvious trace of it in the image itself that a fingerprint examiner would be able to see visually would be exceptionally difficult.

**Mikalaa Martin** [00:28:40] And going back to a theme that came up earlier surrounding education, especially investigators and cases, in your opinion, is there anything that the latent print community can do to educate law enforcement on the utility and value of this type of evidence?

**Tim Fayle** [00:28:56] Yeah. Conversations, Communications. Like most things in life, right. And especially work conflict, all of it. It always comes down to communication, right? So this is no different. And I would say the key here is having those conversations with your detectives, talking to them about this type of evidence, talking to them about how you can use it if they come to you with this type of evidence, what kind of cases you can use in the pedophile cases, search warrant, social media post for any kind of crime, all of those types of cases, you can have a discussion with the detectives. You could show them examples. There are now plenty of them that have been published. So just doing a Google search on this kind of information, you'll be able to find a whole bunch of published articles about cases where this type of evidence has been involved.

**Mikalaa Martin** [00:29:41] I love how you mentioned kind of the onset of of cases employing this kind of approach early, early on, starting those conversations. To swap over to the other side of maybe outcomes. Are there any legal considerations surrounding the use of photographed hands and other ridge detail posted on social media or other media platforms?

**Tim Fayle** [00:30:02] So first of all, there's the legality of obtaining any evidence which applies to, well, any evidence that way we want to talk about, right? So above and beyond that initial legality of seizure of evidence, which by and large the detectives are the ones who mainly have to worry about. The audit trail of those images, as I've mentioned before, is is really critical here. So maintaining that audit trail, whether you have a digital image management system that does that as part of the process that it has for images from the moment it's stored, it archives the original copy. And then you're only ever working with a copy of the original as opposed to the original image. Or if you have to do that manually.

Either way, maintaining that audit trail, if you use Photoshop, Photoshop has a setting to turn on your metadata tracking, so it will track anything that is done to that image that you've done to it in Photoshop in the metadata via that metadata tracking. So that's key. I would also say in the legal aspect like we have with any new enhancement tool or development medium, you know, a new chemical, a critical thing that happens with any of those circumstances is a validation study. So luckily for us, a validation study has been done, has been completed and has passed accreditation and that was done in the UK. And so that validation study was very broad, ranging to very lengthy document. The UK agency that did it is more than happy to share that validation study with examiners, but they passed, I believe it was October 2023. The validation study was was approved through their accreditation assessors. So I would say those those two things are pretty key. And being able to point to that study, maybe having your own internal assessment in your own agency, not a full blown validation study because that's already been done for for start, but some sort of internal confirmation that this type of evidence works in in your procedural set up, I would say is also important. Really, those are the key things to be aware of, legally speaking, in my opinion.

**Mikalaa Martin** [00:32:02] And a few items I feel and themes that have come up through our discussion. But I would be curious to know in your perspective and in your your journey with this type of evidence and presenting to various audiences and learners for adding this to their toolkit, are there any identified needs or recommendations that you have for overcoming any of the current challenges or gaps regarding this type of evidence in the field?

**Tim Fayle** [00:32:26] Yeah. So probably my biggest one and I made mention of this in my talk at the conference this year, is making sure that you don't have such a restrictive policy on the receipt of images of friction ridge detail so that you eliminate some of this type of evidence from coming into your lab from the get go. And what I mean by that is, particularly in the US because of, you know what, slow down from the Mayfield era, for example, with latents requiring a thousand PPI minimum resolution to be submitted, at least to the FBI for searching, for example. So having a and I know a number of agencies that have policies like this where they say all images of friction ridge detail, must be a minimum of 1000 PPI, otherwise they will not be accepted. And having a restrictive policy that doesn't even allow an image to be assessed on its own merit is potentially very damaging for this type of evidence. Because remember what I said about social media platforms so often compress the images when they're posted to social media. The control of the capture of these images isn't there compared to a CSI capturing a photograph of a print at a crime scene, or a lab technician photographing a light on an evidence item where they know the camera settings they have to use. They know how to photograph a print so that it's a thousand PPI when it's recalibrated minimum with this type of evidence though that's not the case. Now with the quality of phone cameras just getting crazier and crazier, it tends to be a bit less of a problem these days, but it's still it definitely exists. And so not having such a restrictive policy to preclude receiving an evidence image, if it happens to recalibrate the under 1,000 PPI is really important here. So that very first case that I talked about, the 2015 one out of Los Altos, when I recalibrated that to scale using that Clonazepam pill as a scale, it came back to around 320 PPI. So it would be very much below what most examiners would consider as acceptable. Being either a 1,000 or some use 500 minimum. However, every time I've put that on screen, which I did again at the conference and I said, Who here in this audience believes that this print is perfectly suitable to be used in comparison and to be able to be identified. And well, as far as I could tell, everyone in the crowd raised a hand. It's at a crystal clear, beautiful palm print that we're talking about with very clear detail. It's just a case that the image is 320 PPI. So

I think having a policy that allows you to assess images on their own individual merit and assess if the detail is clear enough to be able to accurately and confidently determine the detail, ridge detail, that's that's visible in the image as opposed to saying hard and fast, No, it has to be a thousand PPI or else. That's my number one recommendation here. And this conversation I had with a number of people at the conference this year and matter of fact, had a back and forth on on email with with a few people is okay, here's our current policy. How could we adjust it so that it's not as restrictive but still making it clear to the people who submit their crime scene evidence to us that they need to maintain a minimum standards for their evidence. So having the verbiage around that, it does sort of force them to do it, what we might say the right way and having the proper resolution for the images they're capturing under controlled circumstances versus an uncontrolled circumstance like a social media post image and being able to assess it on its own merits.

**Mikalaa Martin** [00:35:59] You bring up a great point regarding the technological advancements that have occurred over the past several years with smartphone camera capabilities. From your own casework, experience and discussions with agencies that have utilized this type of evidence in their cases, could you see inadvertently photographed or friction ridge detail being utilized and cold case investigations, whether that be cases with social media evidence or even photograph evidence from cases predating the current social media era?

**Tim Fayle** [00:36:29] Yeah, absolutely. Or even the search warrant photos. Right. So search warrant images could go back, you know, 40, 50 years. Right. And not digitally, obviously. But if there's somebody sitting in a cold case folder, an image that happens to include ridge detail in it, then why not? And actually on that front, this is one that I didn't include in this talk, but I did talk about it, the conference as a different case. I presented on a 1979 cold case homicide as the conference as well, where in that particular case and it was very fortuitous. And I always say to examiners, if you have something to present about, even if you don't think someone wants to hear it, there are people that do want to hear it. Please do present at conferences. And one of my best reasons for that was this case. Anyway. When I was putting together the talk, I looked at the autopsy photos and I realized that there were four photographs of the forearm and hand of the victim, and they were taken of I don't know what the medical terms of it, but showing the palm of the hand and then showing the back of the hand so so rotating, but showing the forearm and the hand. And in those images now, these were Polaroids, right? And they were scans of the Polaroids. So I've zoomed into these the hand parts of these Polaroid images, the scans of the Polaroids that I had. And I realized, particularly in the high Pacino area of the palms, there was good ridge detail there and went ahead and compared that to the remaining latents in the case. And lo and behold, was able to identify one of those remaining prints in a very probative area to the victim and ruled that one out from being considered as a potential suspect one. So absolutely, when you're talking cold case, there's a real case example where this type it was an inadvertently captured ridge detail there is no way known that that coroner or the coroner's assistant was trying to capture the ridged detail in that hand. When they photographed the forearm and hand, they were purely just trying to show some injuries that the person had sustained during the attack. But there's a real life example where this can be applied to Cold case. So absolutely, I think it has application obviously in more recent years, cold case work for sure, because you're dealing with digital evidence, you're dealing with social media posts, you're dealing with iPhones and other types of phones, cameras, capturing things. But even the older ones for sure, absolutely can be applied.

**Mikalaa Martin** [00:38:47] That's an incredible case, especially for scanned Polaroid captures. Thank you for sharing that.

**Tim Fayle** [00:38:54] Yeah, absolutely.

**Mikalaa Martin** [00:38:55] Thank you for your time discussing the fascinating topic of social media fingerprints, Polaroid fingerprints, and other inadvertently photographed ridge detail and how this type of evidence can support case resolution. Tim, it has been a pleasure talking with you today.

**Tim Fayle** [00:39:11] Thank you. And a pleasure as well Mikalaa. And I very much appreciate your time and asking me to be involved in this.

**Mikalaa Martin** [00:39:17] If you enjoyed today's episode, be sure to like and follow Just Science on your platform of choice. For more information on today's topic and resources in the forensics field, visit forensicCOE.org. I'm Mikalaa Martin and this has been another episode of Just Science.

**Introduction** [00:39:36] Next week, Just Science sits down with Dr. Michael Nirenberg to discuss the forensic subdiscipline of forensic podiatry and a variety of cases that he is supported through performing gait analysis and utilizing footprint impression evidence. Opinions or points of views expressed in this podcast represent a consensus of the authors and do not necessarily represent the official position or policies of its funding.