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Capture and analysis of 3D footwear evidence

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Footwear impressions provide an important source of evidence within a range of criminal investigations. They can place a suspect at a crime scene or link multiple crimes helping to build a picture of criminal activity. Despite rapid advances in other areas of forensic science, the techniques and tools used to capture and analyse footwear evidence have hardly changed in over a hundred years. Tracks are still cast in plaster, photographed and compared visually, all of which is time consuming and consequently footwear evidence is no longer routinely collected by all UK police forces. This is beginning to change however and the 3D imaging now offers a superior approach to the capture and analysis of footwear impressions. By translating academic research into ancient footprints and technical 'know-how' into a freeware software product, it is now possible to create accurate and precise 3D models using nothing more than twenty to thirty oblique photographs. We demonstrate how comparison of 3D images, either multiple tracks or a track with a shoe sole, can be achieved and illustrate the advantages over other methods. For example, given a line of multiple tracks made by one individual, using DigTrace it is possible to compute an average 3D track from the population. Similarly, using the same technology you can compare a track to a 3D model of a suspect's sole.

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