

Contemporary method of establishing a bloodstain source in 3D space – a pilot study on the application of BackTrack™ Suite software

Katja Drobnič, Ph.D., Associate Professor of Criminalistics, University of Maribor, Faculty of Criminal Justice and Security, Kotnikova 8, 1000 Ljubljana, Slovenia; Quality Control Manager, National Forensic Laboratory, General Police Directorate, Ministry of the Interior, Štefanova 2, 1000 Ljubljana, Slovenia

Anja Oblak, a Graduate in Criminal Justice and Security Studies

Aljaž Žbogar, a Graduate in Biochemistry, Expert in Criminalistics, National Forensic Laboratory, General Police Directorate, Ministry of the Interior, Štefanova 2, 1000 Ljubljana, Slovenia

There are several methods of analysing a source of bloodstains in 3D space. They differ in terms of mode of execution, which can range from an entirely manual to a completely automated process of analysis. This paper will present a simple and efficient method of establishing a source of bloodstain patterns in 3D space using BackTrack™ Suite software. For the purpose of this study, 9 bloodstains were analysed, realised in six attempts, while a total of 80 blood stains were subject to analysis. The average difference between the actual and calculated values of source of bloodstains in 3D space with BackTrack™ Suite software is behind the coordinates X, Y, both of which determine the location of the source of bloodstains in the layout plan of a space 5.9 cm (± 4.3) and 6.1 cm (± 7.8). The average difference in the third coordinate (coordinate Z), which is used to establish the distance of the source of bloodstains from the floor is, however, considerably larger, measuring 15.4 cm (± 10.5). The mean value of coordinate Z, which, for bloodstains on the wall, was within 6 cm (± 2.1) of the actual value, was also calculated. The study confirmed that the precision and the accuracy of analysing the source of bloodstain patterns by 3D space with BackTrack™ Suite software is adequate for the envisaged purpose, that is for establishing the area of the source of bloodstains and not the point of source. The appropriateness of this method was not tested only for stains on a wall, as had been done by previous studies (Carter et al., 2005, Carter et al., 2006), but also for stains on the floor. The precision and accuracy of this method with BackTrack™ Suite software was additionally confirmed by comparison of results that were calculated with a tangent method. To the best of our knowledge, this study is the first comparative validation study of the two methods published to date. The results obtained by the BackTrack™ Suite software are on average more precise and accurate. The method of establishing the source of blood stains by 3D space with BackTrack™ Suite software has already been tested in crime scene reconstruction. The results conformed to the statements of participants.

Key words: bloodstains, blood traces, pilot study, validation, source of bloodstains in 3D space, virtual string method, tangent method, BackTrack™ Suite.

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