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Digital evidence, ‘absence’ of data and ambiguous patterns of reasoning[☆]



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ABSTRACT

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In this paper we discuss the use of digital data by the Swiss Federal Criminal Court in a recent case of attempted homicide. We use this case to examine drawbacks for the defense when the presentation of scientific evidence is partial, especially when the only perspective mentioned is that of the prosecution. We tackle this discussion at two distinct levels. First, we pursue an essentially non-technical presentation of the topic by drawing parallels between the court's summing up of the case and flawed patterns of reasoning commonly seen in other forensic disciplines, such as DNA and particle traces (e.g., gunshot residues). Then, we propose a formal analysis of the case, using elements of probability and graphical probability models, to justify our main claim that the partial presentation of digital evidence poses a risk to the administration of justice in that it keeps vital information from the defense. We will argue that such practice constitutes a violation of general principles of forensic interpretation as established by forensic science literature and current recommendations by forensic science interest groups (e.g., the European Network of Forensic Science Institutes). Finally, we posit that argument construction and analysis using formal methods can help replace digital evidence appropriately into context and thus support a sound evaluation of the evidence.

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Introduction

Preliminaries and case description

The case discussed here pertains to an appeal formed by A. to the Swiss Federal Criminal Court against an extension of his pretrial detention.² A. is being investigated by the Office of the Attorney General (OAG) of Switzerland on suspicion of attempted intentional homicide (art. 111 in

conjunction with art. 22 of the Swiss Criminal Code) and endangering by explosives and toxic gases with criminal intent (art. 224 of the Criminal Code).

The facts, as presented by the prosecution, are as follows. A.'s estranged wife, B., was walking down a sidewalk in the city of Z. (Switzerland) at 6:30AM one morning when she was hit by a hand grenade thrown at her. The explosion caused her injuries to the abdomen and to her left hand. B. testified that she had not seen who had attacked her, but said that A. had been following her for some time. At the crime scene, the police were able to locate the detonation point and saw several indentations on the curb of the pavement. The police also seized several fragments of plastic, small metal balls and a lever, all identified as constituting elements of a model of hand grenade used by the former Yugoslavian army. During his first interrogation by police, A. said that he was in Bosnia and Herzegovina at

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² Swiss Federal Criminal Court, decisions BH.2014.16 and BP.2014.59.

the time of the crime. However, subsequent police investigation revealed that A. had crossed the Swiss border into Italy approximately 5 h after the attack on B. took place.

There are two items of scientific evidence in this case. The first is a DNA-profile established from a swab of the surface of the lever of the hand grenade. This DNA was found to correspond to the DNA-profile of A.³ The second item of interest is so-called digital evidence, i.e. a technical report about analyses of telecommunication and navigation data carried out on A.'s mobile devices. According to a report issued by the Federal Criminal Police (FCP), no signals of A.'s mobile devices were detected on the crime scene at the time B. was attacked.

Aims and structure of the paper

In the remainder of this paper, we will take a closer look at the way in which the digital evidence mentioned above was used by the Swiss Federal Criminal Court to justify prolonging A.'s pretrial detention, based on the judgement of the court as it was published.^{4, 5} It is not our intention to question the court's decision in this case. The case is selected for the sole purpose of illustrating the actuality and relevance of the topic. At times, our discussion will include references to a recently published European guideline for evaluative reporting in forensic science (ENFSI, 2015) as well as established principles of forensic interpretation.

Case analysis: digital evidence

The court's summing up

In its written judgement, the Swiss Federal Criminal Court summed up the digital evidence in this case in a single sentence (Section 3.3):

“At the time of the crime, no mobile device belonging to A. could be located at the scene.”⁶

The court then used this piece of information received from the FCP to support the following claim:

“This investigative result does not necessarily exclude that the complainant [Mr. A.] could have been present at the crime scene at the time when the crime was committed.”^{7, 8}

³ This paper does not deal with the issue of the probative strength to be assigned to this correspondence.

⁴ Above n 2.

⁵ Note that this is our only source of information regarding the case.

⁶ Translation and text between brackets added by the authors. The original sentence is: “zum Tatzeitpunkt [konnten] keine Verkehrsdaten der Mobilfunkgeräte des Beschwerdeführers geortet werden”.

⁷ Translation and text between brackets added by the authors. The original sentence is: “Schliesst doch dieses Ermittlungsergebnis nicht zwangsläufig aus, dass sich der Beschwerdeführer zum Tatzeitpunkt am Tatort befunden haben könnte”.

⁸ Note that the transcript is silent about further details regarding the perimeter of what is referred to as the ‘crime scene’. Further discussion about technicalities of geographic location using mobile devices is beyond the scope of this paper.

These two sentences are concise, but they contain elements that are useful for the present discussion. In general terms, the court is of the opinion that the digital evidence does not – literally – falsify the prosecution's case. This conclusion raises a series of questions, such as: ‘If the digital evidence does not falsify the prosecution's case, what effect – if any – does it have on the prosecution's case?’ and, equally important, ‘What – if anything – does the digital evidence say with respect to A.'s case?’. In the next sections, these questions will first be approached from a general perspective, invoking legal (Section [Legal considerations](#)) and scientific criteria of evaluation (Section [General observations](#)). Attention will be drawn to potentially ambiguous reasoning patterns and parallels to argumentative drawbacks commonly encountered with other types of scientific evidence. The outcomes of this discussion will be contrasted, in Section [Principles of scientific interpretation](#), with a formal analysis of the case using standard elements of probability and graph theory.

Legal considerations

The written judgement issued by the Swiss Federal Criminal Court in this case⁹ examines the question of whether A.'s pretrial detention should be prolonged. At this stage, the court does not evaluate the evidence fully, but only considers whether the four following conditions are fulfilled (art. 221 Swiss Code of Criminal Procedure): a) there is a strong suspicion b) that the suspect committed a felony; c) there is a serious risk of flight, of reoffending or of tampering with the evidence; and d) the duration of pre-trial detention is proportionate with regards to the sentence that will likely be imposed by the court in case of conviction.

In this case, the question is thus whether the evidence presented by the prosecution is strong enough to entail a strong suspicion that A. threw a hand grenade at his wife and that there is a risk of flight, reoffending or tampering with the evidence. The burden of proof lies with the prosecution, but there is no strict standard of proof in the field of pretrial detention: the evidence will have to be all the more stronger that the proceedings are advanced and that the case is close to being sent to trial, but it does not need to reach any given threshold. Conversely, at the onset of an investigation, it is acceptable to base the decision to put the suspect in pretrial detention on evidence that is still somewhat weak. To remedy this weakness, more evidence is adduced. In this context, credible evidence of innocence is not necessarily enough to prohibit authorities from imposing pretrial detention, if it is countered by credible evidence of guilt.¹⁰

In the present case, the court held that the digital evidence did not falsify the hypothesis presented by the prosecution. Although legitimate at this stage of the proceedings, this is a limited and partial perspective, in that it

⁹ Above n 2.

¹⁰ In the adjudication stage, however, the accused cannot be convicted if the court has not reached the firm conviction that the accused is guilty – a standard similar to proof beyond a reasonable doubt.

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