Chapter 6
Assisted Authentication

ABSTRACT

The present chapter deals with the issue of information manipulation detection from an algorithmic point of view, examining a variety of authentication methods, which target assisting average users and media professionals to secure themselves from forged content. The specific domain forms a very interesting, highly interdisciplinary research field, where remarkable progress has been conducted during the last years. The chapter outlines the current state of the art, providing an overview of the different modalities, aiming at evaluating the various types of digital data (text, image, audio, video), in conjunction with the associated falsification attacks and the available forensic investigation tools. In the coming years, the problem of fake news is expected to become even more complicated, as journalism is heading towards an era of heightened automation. Overall, it is anticipated that machine-driven verification assistance means can speed up the required validation processes, reducing the spread of unverified reports.

INTRODUCTION

Nowadays, Social Networking Sites (SNSs) have become the most dominant place for news origin and propagation. Although journalists have in their availability innumerous ways for verifying SNSs streams, these means also require different competences and expertise (Brandtzaeg, Luders, Spangenberg, Rath-Wiggins, & Folstad, 2016). Subsequently, multimedia evaluation for discovering the evidence of potential tampering has become a significant and currently popular research field among disciplines. The formed domain of Digital Forensics Science (DF /DFS) embraces a broad combination of various technological and methodological approaches. In principle, DFS has been launched for commonly addressing the recovery and investigation of material found in digital devices, often in relation to computer crimes. In recent years, the term is more often attributed to the analysis of the counterfeit instances of individual resources, which is the objective of DF inspections. Indeed, given that most of today's articles are composed by Multimodal Media Assets (MMA), altering operations usually involve all the encountered types of digital assets, i.e. text, images, audio, video, etc. (Dimoulas, Veglis, & Kalliris, 2014; 2015; Katsaounidou, 2016; Katsaounidou & Dimoulas, 2018). Each content entity has distinct communicative and operative characteristics, which are taken into consideration for applying potential forgery actions. Likewise, strategies for verifying the integrity of the different categories also rely on their unique representative features (Katsaounidou & Dimoulas, 2018). Overall, there are two discrete though supplementary issues: integrity and authenticity. Integrity ensures that the involved media components have not been modified, while authenticity refers to the ability to confirm the integrity of the provided information, as a whole.

According to a recent survey (Brandtzaeg et al., 2016), Twitter is the most popular SNS platform, commonly used as informing source. In specific, journalists are trying to stay tuned /up-to-date and aware of the newsworthy events, by monitoring Twitter profiles /posts and the associated breaking news alerts. Various add-on tools have also emerged for helping to organize /structure timelines, keeping track of lists, searches, activities and more (Tame.it, TweetDeck, etc.). On the contrary, Twitter is an excellent example concerning the dissemination of unverified textual streams. With the previous restriction state of the maximum number of one hundred and forty (140) characters, Twitter messages, the so-called tweets, often used to contain odd

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