Chapter 8
Cross–Media Authentication and Verification

ABSTRACT

The present chapter outlines the potentials of cross-media authentication solutions by correlating all the available information streams involved in multiple media (i.e., content/channel-adapted modalities, linking mechanisms, users' feedback, metadata). The proposed model attempts to thoroughly analyze the existed (and detected) diversities, aiming at seeking for "consistent inconsistencies" (i.e., specific dissimilarities that are proportionately steady in most "comparison pairs"). Full range of forgery detection strategies are taken into consideration (i.e., best practices adopted by humans, algorithms, and intelligent systems implemented through machine learning, their dynamic combination, etc.). Thus, the current framework ventures to concatenate all the involved approaches, which are related to both multiple publishing channels and news verification. Hence, the "cross-media" term has a broader meaning, encapsulating the sub-cases of cross-/trans-media publishing and storytelling, with respect to cross-validation of information, along with the entire landscape of digital media.

INTRODUCTION

During the last decade, the tremendous progress in the Information and Communication Technologies (ICTs) has drastically altered mass communications into a social networking environment, revolutionizing the processes of news informing. Apparently, the new era has been dominated by the contemporary forms of Journalism, where multiple publishing means and digital storytelling have prevailed. Nowadays, most media organizations utilize more than one channel to disseminate their news articles, while active user engagement is also propelled, taking advantage of content contribution, commenting and sharing services, through the models of User Generated Content (UGC). No doubt, the advent of citizens' and participatory journalism further extended the plurality and diversity of the exchanged news information, yet with the counterbalance of the potential propagation of unverified content and, therefore, with the associated necessity for reconsidering validation codebooks. Indeed, the wide expansion in the use of mobile devices / computing systems (i.e. smartphones and tablets), and their inherent multimedia capturing and networking capabilities, made possible the massive production and distribution of multimodal digital content. Moreover, the availability of easy to use software and cloud computing services expedited the potentials of "shaping" and altering multimedia documents (not only text, but also images and audiovisual streams, as well). Considering that, in many cases, these media assets are used as proof evidence of the corresponding news events, the convenience of the digital processing broadened the possibilities for intentional content tampering and falsification, thus opening another backdoor of misinformation propagation (Dimoulas, Veglis, & Kalliris, 2014, 2015, 2018; Ho & Li, 2015; Katsaounidou & Dimoulas, 2018; Pantti & Sirén, 2015; Pasquini, Brunetta, Vinci, Conotter, & Boato, 2015; Silverman, 2013; Veglis, Dimoulas, & Kalliris, 2016).

While cross- and trans-media publishing systems have become the everyday practice of the average journalist in most professional organizations, this is not the case for the arising cross-validation demands. For this reason, the Forensics (or Digital Forensics -DF) field has emerged, purposing to face the majority of the forgery detection problems, so as to force news authentication. Although multimedia veracity techniques form a rapidly evolving research area with remarkable progress, simple, accurate and reliable tools to be used in real-world scenarios are still missing (Katsaounidou 2016; Katsaounidou & Dimoulas, 2018). This fact is further complicated by the plurality of the

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