Cost Action CA-17124 DigForASP: A European cooperative Action for AI applications in Police and Digital Investigations
An Exploration of Investigation Complexity

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Abstract
In the frame of Police Investigations, in particular to Digital Investigations and Digital Forensics cases, data collection on "crime scenes" needs further elaboration for the contextualization in the real case. The Evidence Analysis phase has the aim of selecting relevant data and selecting …

Introduction
"Digital Forensics" is a part of the Criminological Sciences which deals with digital evidence recovery and exploitation in the solution of criminal cases through the application of scientific principles. There are sev- eral and increasingly sophisticated methods for collecting digital evidence. As a matter of fact, the evolution of technology continuously pushes such kind of methods. Rough evidence must however be used to elicit hypertext information, and therefore, the procedures (both of data storage and evidence analysis) need to be applied in order to present in court. Evidence analysis involves examining fragmented incomplete knowledge, and reconstruct- ing and aggregating complex scenarios involving time, uncertainty, causality, and alternative possibilities. No existing knowledge model for digital evidence analysis is suitable. Scientists, judges, and Jurists, should thus be aware of the complexity of digital evidence and illustrate the analysis of investigative data as well as the formulation of hypotheses for the resolution of complex cases, through Artificial Intelligence techniques available to guarantee ethics, reliability and verifiability.

Structure and Activities
DigForASP has more than 200 participants (of which 40% women) from 35 of European Union countries, 19 ICT countries ("Inclusiveness Target Countries"), and Ukraine as NNC (Near Northern Country). The Action Coordinator is Prof. Viviana Mascardi from the University of L’Aquila and the Science Communication Manager is Prof. Stefania Costantini from the University of L’Aquila and the Science Communication Manager is Prof. Francesca Alessandra Lisi of the University of Bari.

The Action is based on ideas developed in the Doctoral Thesis by Raffaele Olivieri, a WGI Office of Italian Carabinieri (supervisor Prof. Stefania Costantini) and provides the following scientific packages.

WG 1: Digital Forensics requirement analysis

WG 2: Research on applications of AI/AR to DF

WG 3: Development of software prototypes that apply techniques of AI/AR (as those spotted in WG2) to differ-

WG 4: Benchmarks based on real cases

WG 5: Platform integration and multi-dimensional environments

WG 6: Training, education and dissemination activities

WG 7: Training, education and dissemination activities

WG 8: Short-Term Scientific Missions

The activities promoted by the Action are from time to time published on the website: https://digforasp.uca.es/. They allow computer scientists to understand the problems main and the open prob-
lem related to the context of digital forensics and their applications. They also help to manage the exploitation of AI to deal in an innovative way, effective and key issues in the digital field. As a matter of fact, the Action partners have identified applicable techniques, and they will have to suggest guidelines for creation and development of new techniques and methods aimed at searching of the art in both areas. This will strengthen European research and the capacity for innovation in these areas.

Main Objectives

1. WG1 Digital Forensics requirement analysis: Leader Dr. Raffaele Olivieri
Identify problems, in Digital Forensics sectors and in its analysis processes, that involve the examination of information technologies. To this end, they have identified a framework in which include all the activities, and they have identified the evolution of time, uncertainty, causality, doubts, randomness and the existence of alternative solutions.

2. O1: Increasing awareness among researchers in AI and Automated Reasoning of the main issues and prob-

3. O2: Identify a list of realistic and applicable AI and AR technologies, focusing on Computational Logic for verifiability and justifiability reasons (essential in a legal environment);

4. O3: Promote R&D activities for integrating such techniques and defining new methods and tools;

5. O4: Foster and coordinate related R&D activities of the partners.

6. O5: Collect and organise anonymised data extracted from real cases provided by the DF Action partners, and devising suitable benchmarks concerning the solution of such cases.

7. O6: Promote and maintain the Action Website as well as oversee Social Media presence, collect and study the different meetings in digital forensics and related areas organised by the partners and their contribution to the field of digital forensics;

8. O7: Collect and organise anonymised data extracted from real cases provided by the DF Action partners, and devising suitable benchmarks concerning the solution of such cases.

References