
DESCRIPTION

Digital Forensics is a part of the Criminalistics Sciences which deal with digital evidence recovery and exploitation in the solution of criminal cases through the application of scientific principles. There are several, increasingly sophisticated methods for collecting digital evidence. As a matter of fact, the evolution of technology is continuously advancing such kinds of methods. Partial or incomplete evidence must however be used to elicit hypotheses concerning events, actions and facts (or sequences of them) with the goal to obtain evidence to present in court. Evidence analysis involves examining fragmented incomplete knowledge, and reconstructing and aggregating complex scenarios involving time, uncertainty, causality, and alternative possibilities. No established methodology exists today for digital evidence analysis. Scientific Investigation experts usually proceed by means of their experience and intuition.

The Challenge of the proposed COST Action consists in creating a Network to explore the potential for applying methods of Artificial Intelligence and Automated Reasoning in the Digital Forensics field, and create synergies between these fields. More specifically, the challenge is to address the Evidence Analysis phase, where evidence about possible crimes and crime perpetrators collected from various electronic devices (by means of specialised software, according to specific regulations) is exploited in order to reconstruct possible events, event sequences and scenarios related to a crime. Evidence Analysis results are then made available to law enforcement, investigators, public prosecutors, lawyers and judges: it is therefore crucial that the adopted techniques guarantee reliability and verifiability, and that their results can be explained to the human actors involved.

ORGANISATION

Action Chair:

Jesús Medina
Universidad de Cádiz, Spain

Action Vice-chair:

Stefania Costantini
Università degli Studi dell'Aquila, Italy



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MEMBERSHIP

Who should join?

Membership in DigForASP is open to research groups from universities and other organisations working in any of the areas covered by the Action. For further information send an e-mail to digforasp@uca.es or visit www.digforasp.uca.es

Benefits

Depending on their eligibility for EU-funding, members may receive support for organising or participating in the activities of the Action. These include Working Group meetings, workshops, seminars, study abroad grants for PhD students, exchange visits for post-doctoral and senior researchers.

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DIGFORASP

**DIGITAL FORENSICS:
EVIDENCE ANALYSIS VIA
INTELLIGENT SYSTEMS
AND PRACTICES**
(COST Action 17124)

WORKING GROUPS Aims & Objectives

WG1 Digital Forensics requirement analysis

Identify problems, in Digital Forensics (DF) sectors and in its analysis processes, that involve the examination of incomplete or fragmented knowledge, or which include complex scenarios about the evolution of time, causality, uncertainty, doubts, randomness and the existence of alternative solutions, to allow at WG2 to research solutions through the application of verifiable techniques, in a legal framework, based on Artificial Intelligence (AI) / AR and Computational Logic.

Leader *Raffaele Olivieri*
Vice-Leader *Zeno Geradts*
ECI Vice-Leader *M^a Eugenia Cornejo*

WG2 Research on applications of AI/AR to DF

The main challenges WG2 will address are:
- Promote and facilitate understanding of the Digital Forensics domain through targeted multidisciplinary activities, including characterisation of real use-cases as well as analysis of available digitized datasets;
- Design computational methods that are able to take into account the diversity of multiple evidence in terms of their granularity, legal remit, quality, relevance, timeliness, sensitivity
- Develop techniques to ensure that applied automated reasoning methods include human understandable explanations.

Leader *Alessandra Mileo*
Vice-Leader *David Pearce*
ECI Vice-Leader *Mark Scanlon*

WG3 Prototypes and Platforms

Main goal: development of software prototypes that apply techniques of AI/AR (as those spotted in WG2) to different practical scenarios in DF (extracted from WG1). These prototypes may combine several existing (or adapted) platforms for AR/AI and will be tested on benchmarks, either synthetically generated or using anonymized data from real cases (once WG4 starts producing results). Prototypes will simply act as proofs of concept although, in their later versions, they may incorporate aspects from WG5 to integrate information from different sources and devices.

Leader *Pedro Cabalar*
Vice-Leader *Torsten Schaub*
ECI Vice-Leader *Pedro Salgueiro*

WG4 Benchmarks based on real cases

Main goal: development of a suite of benchmarks for testing the prototypes developed in WG3. The scenarios addressed by the benchmarks and the languages for representing them will come from WG1. With the help of WG3 and WG5, and with the active involvement of domain experts, WG4 will identify qualitative and quantitative measures suitable for assessing the prototypes performances, and will validate and verify such performances by running the test cases in the benchmark suite.

Leader *Viviana Mascardi*
Vice-Leader *Juan Carlos Nieves-Sánchez*

WG5 Platform integration and multi-dimensional environments

Development of methods/software to integrate a variety of AI/AR/DF platforms (WG3) and multi-dimensional data/knowledge resources (WG4), which are developed for different KRR tasks/applications related DF (WG2), and to illustrate their applications on practical scenarios (WG1) providing foundations for future studies.

Leader *Esra Erdem*
Vice-Leader *Daniele Theseider Dupré*
ECI Vice-Leader *Martín Diéguez*

WG6 Meetings, workshops and conferences

Under WG6 various types of meetings, workshop and conferences will be organized in order to share results within the research areas related to the Action. WG6 also promotes that Action members would meet best experts in theory and practice in the field and as a synergy, new methods and techniques will be developed.

Leader *Andreja Tepavcevic*
Vice-Leader *Piotr A. Kowalski*
ECI Vice-Leader *Eloisa Ramirez-Poussa*

WG7 Training, education and dissemination activities

WG7 produces collects and studies the different proposals to organize Training Schools and dissemination activities and publications in particular propose Training Schools and dissemination activities and publications to the MC. Study the negative impact of the given results and advances before the publication and Guarantee that the Action preserves the societal, ethical and legal aspects, and Responsible Research and Innovation.

Leader *Vassia Atanassova*
Vice-Leader *Szilvia Nagy*
ECI Vice-Leader *Andrii Shalaginov*

WG8 Short-Term Scientific Missions and internal organization

The objective of this working group is to foster and coordinate R&D activities of the partners. Particularly, increase awareness among DF experts of new methods and techniques and their applicability, and assist them in the practical experimentation of the new methods, and vice versa. The main tool for the previous objective is the program of Short-Term Scientific Missions. These missions are intended to facilitate the exchange of knowledge between participants from different countries within the Action. This group is also in charge on internal organization matters, such as suggesting the WG in which each new participant should be incorporated, and preparing general reports.

Leader *Manuel Ojeda-Aciego*
ECI Vice-Leader *Ondrej Kridlo*

ORGANISATION

ITC Conference Grants Coordinator

Piotr A. Kowalski
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