

MAVEN's project logo



Illustration of MAVEN's key concept: "search and verify", used in project presentations

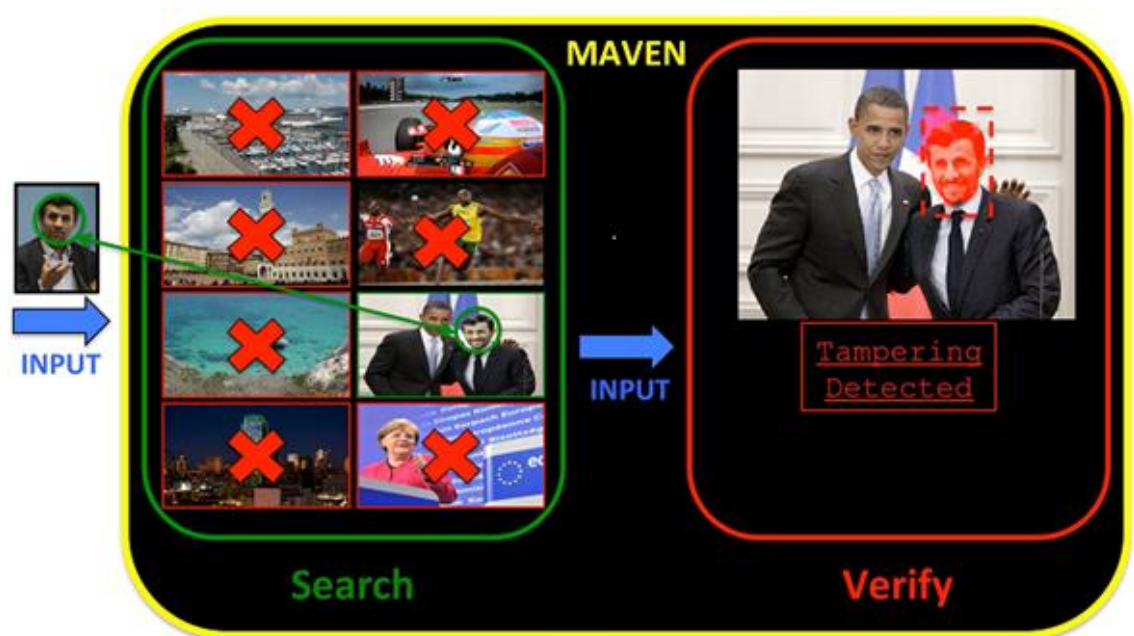
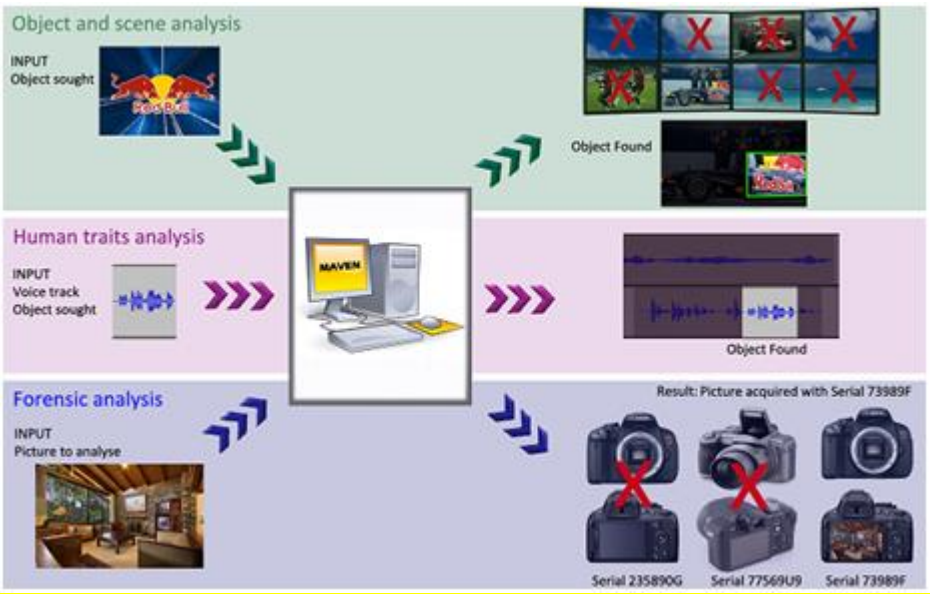


Illustration of a set of MAVEN’s functionalities at a glance.



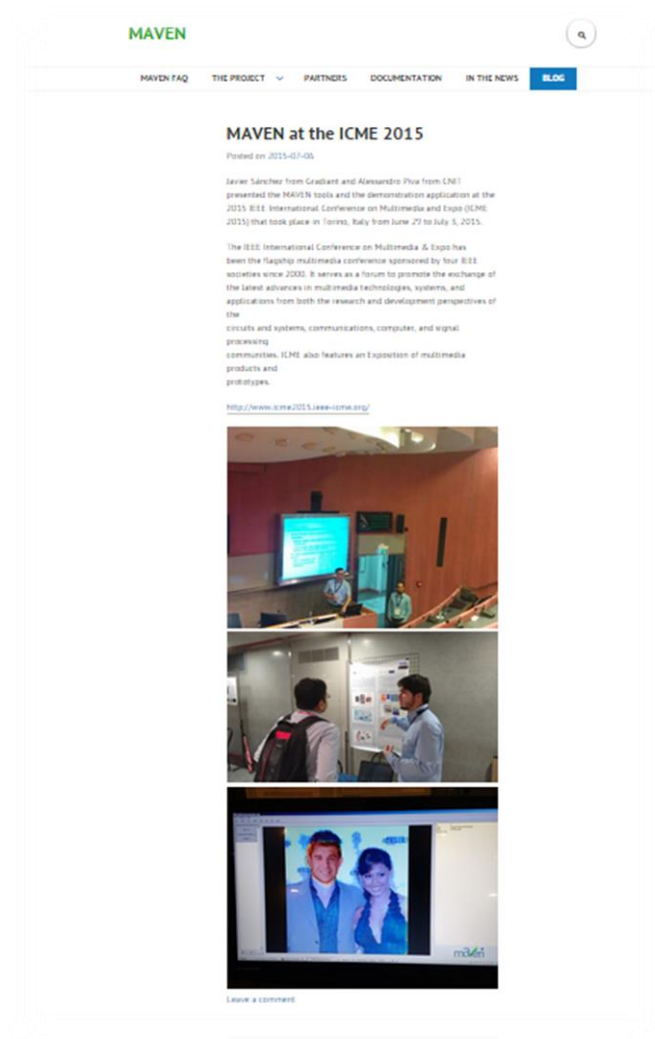
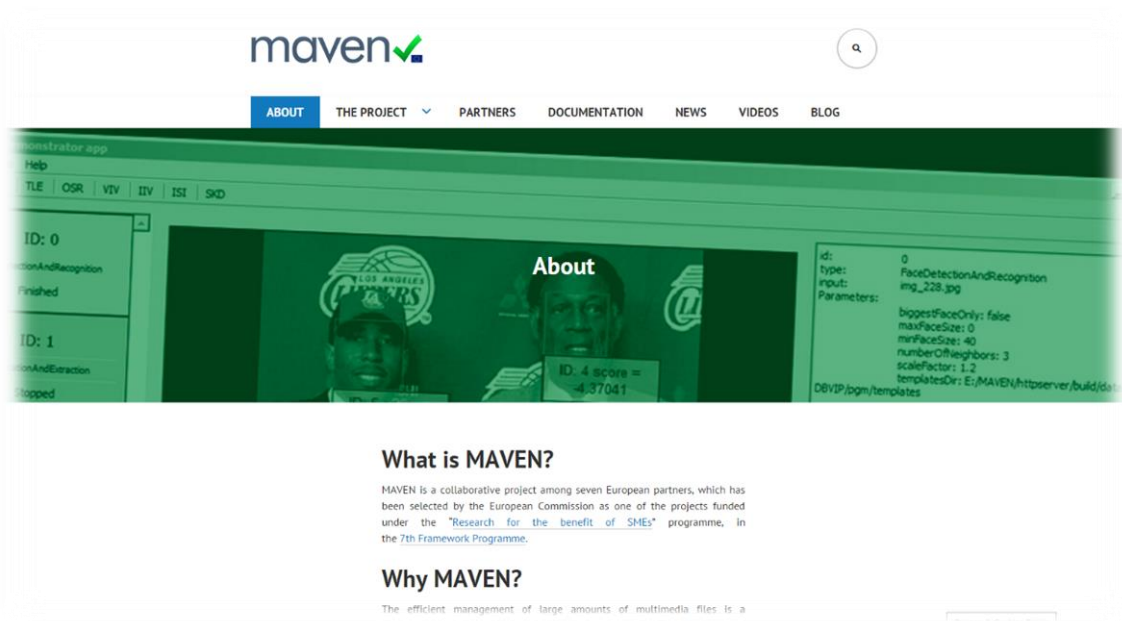
Picture of the kick off meeting, included in the official press release of the project



Rehearsal Meeting (Brussels 8/9/2015)



Updated MAVEN website snapshots



MAVEN presentation at ICME 2015 conference



THE MAVEN PROJECT:

MANAGEMENT AND AUTHENTICITY VERIFICATION OF MULTIMEDIA CONTENTS

C. Ruiz*, G. Ampeo*, J. Kintner*, P. Dugot*, J. Sánchez*, L. Perez-Frutos*, A. De Rosa*, M. Fontana*, A. Costanzo*, A. Pina*, D. Arto*, L. Pina*, R. Alonso*, M. Artero*

*Tager, *Arturo, *GRADANT, CNIT, UNICA, *XTREAM, *Ampeo









Abstract

Management and Authenticity Verification of multimedia contents (MAVEN) is a project focused on the development of a suite of tools for multimedia management and security. MAVEN objectives are centered on **search, search and verify**, integrated in a coherent manner: the search tools for digital contents containing objects of interest and then the search analysis tools to verify their integrity and authenticity. The tools have been developed as a single software framework, and the implementation of a prototype demonstrator application, allowing the end user the possibility of searching for specific contents in order to verify their authenticity.

1. Introduction

Input search verify

Integrity checked

Integrity checked

Integrity checked

Figure 1: MAVEN in a glance. The ultimate goal is to search and verify multimedia contents.

2. MAVEN Consortium

Figure 2: MAVEN Consortium

Figure 3: MAVEN Consortium

Figure 4: MAVEN Consortium

Figure 5: MAVEN Consortium

3. MAVEN Tools

Figure 6: MAVEN Tools

Figure 7: MAVEN Tools

Figure 8: MAVEN Tools

4. The MAVEN Toolkit

The final product is a set of C++ libraries where each module implements a core API. The architecture of the MAVEN toolkit ensures modularity and interoperability, and enhances the maintainability and ease of use of the MAVEN tools.

5. MAVEN demonstrator application

Figure 9: The MAVEN demonstrator application

Proof of concept: the MAVEN toolkit deployed in a server, where to multimedia contents are stored from a desktop client application. Currently no beta version, only version of the toolkit are included.

6. Expected Impact

The results of MAVEN will allow SMEs, law enforcement bodies, press agencies, insurance companies, and broadcasting companies, among others, to manage their multimedia contents and verify their integrity and authenticity in an efficient and reliable manner.

AMPED will disseminate the results mainly to law enforcement bodies and government agencies, which will benefit from advanced tools for forensic and intelligence activities.

ACTIVUS will disseminate the results in professional communities of web, television developers dealing with large image databases.

XTREAM will disseminate the results in the dissemination and exploitation of MAVEN technologies in market segments where it already possesses a well-developed distribution and partnership network, in particular Government and Household Security.

7. Conclusions

MAVEN is a set of multimedia tools and content search tools for multimedia contents, have been implemented in a single framework.

The different tools have been implemented according to design guidelines which ensure modularity and interoperability, thus enhancing the maintainability and ease of use of the system.

The project results are being transferred to the different SME partners. The transfer of technology will have a significant impact on the multimedia content market.

Acknowledgments

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MAVEN demo at ICME 2015 conference



ICME's 2015 MAVEN project paper frontpage

THE MAVEN PROJECT: MANAGEMENT AND AUTHENTICITY VERIFICATION OF MULTIMEDIA CONTENTS

C. Ruiz^{*}, S. Arroyo^{*}, I. Krsteški[†], P. Dago[‡], J. Sánchez[‡], L. Pérez-Freire[‡], A. De Rosa[~], M. Fontani[~], A. Costanzo[~], A. Piva[~], D. Ariu[~], L. Piras[~], R. Ahumada[~], M. Jerian^{*}

^{*}Taiger, [†]Arthaus, [‡]GRADIANT, [~]CNIT, [~]UNICA, [^]XTREAM, ^{*}Amped
{carlos.ruiz, sinuhe.arroyo}@taiger.com, igork@arthaus.mk, {pdago, jsanchez, lpfreire}@gradient.org,
alessia.derosa@unifi.it, marco.fontani@gmail.com, andrea82@gmail.com,
{davide.ariu, luca.piras}@dice.unica.it, rahumada@xtreamsig.com, martino.jerian@ampedsoftware.com

ABSTRACT

MAVEN (Management and Authenticity Verification of multimedia contENts) is a European FP7 Project focused on the development of a suite of tools for multimedia data management and security. MAVEN objectives are centered on two key concepts, search and verify, integrated in a coherent manner: the system first searches for digital contents containing objects of interest and then applies advanced forensic analysis tools to verify their integrity and authenticity. These capabilities have been developed as a single software framework, and the project also involves the implementation of a prototype demonstrator application, which brings to the end user the possibility of searching for specific contents in media while verifying their authenticity.

Index Terms— media analysis, multimedia search, multimedia forensics, EU project

1. INTRODUCTION

The 21st century society is universally recognized as the information and communication society. Information is continuously generated, acquired, and shared. A large part of this information is stored within multimedia documents generated in a number of different scenarios. It must be also considered that the availability of low-cost, high-capacity storage devices makes easy to quickly accumulate thousands of multimedia files.

Thus, the efficient management of large amounts of multimedia files is indeed a challenging task. In addition, it is common knowledge that digital assets are extremely volatile, in the sense that digital documents can be easily edited, intentionally or unintentionally, so that their content can be modified and the conveyed information can change its meaning. It is incontrovertibly true that digital documents are natively more prone than others to modifications and tampering: thus, in order to make this information valuable, it is fundamental to verify the integrity of the document for assuring the authenticity of the associated information. Governments, national and international associations are

aware of the fact that the phenomena may also have legal, ethical, social, and cultural implications.

The MAVEN Project¹ addresses these issues by using some of the latest technologies, powering integrity and authenticity verification tools with multimedia analysis algorithms that search for specific contents. In particular, the MAVEN capabilities range from face detection and recognition to image source verification. All the different modules are integrated within the same framework for application development.

2. THE CONSORTIUM

The consortium behind the MAVEN project is formed by a group of four SMEs involved in business areas directly related to the search and verification of multimedia contents: AMPED (Italy), ARTHAUS (Macedonia), TAIGER² (Austria and Spain) and XTREAM (Spain). The MAVEN consortium also comprises three RTD performers with complementary expertise and a strong background in the technological areas related to MAVEN: CNIT (Universities of Siena and Florence, Italy), the Pattern Recognition and Applications group from the University of Cagliari (Italy) and GRADIANT (R&D Center, Spain).

3. THE MAVEN PROJECT

Despite the technological advances in the Security and Media sectors, MAVEN arises from the need of providing such industries with a suite of advanced solutions able to operate in a range of realistic scenarios (CCTV, web images, broadcast data, etc). Moreover, the search and verify concept is not supported in an integrated manner by any tool currently available in the market. The MAVEN suite combines state-of-the-art multimedia analysis techniques with verification algorithms for assessing the authenticity of media assets, providing significant benefits:

- Comprehensiveness: MAVEN integrates seven

¹ <http://www.maven-project.eu/>

² Formerly known as playence

WeMuV 2015 workshop (supported by MAVEN)



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Workshop on Web Multimedia Verification (#WeMuV2015) co-located with ICME 2015, Torino, Italy, 29 June 2015

The wide availability of multimedia capturing equipment (e.g. smartphones, cameras) and the ever increasing use of online social networking and media sharing platforms such as Twitter and Facebook have led to the pervasive use of multimedia content, often user-generated, for reporting on and documenting news stories and events. Establishing the authenticity and veracity of online multimedia content appears to be an increasingly challenging problem, especially in settings where time is a very scarce resource (e.g. breaking news reporting) and the amount of data to be analyzed increasingly large. Failure to verify multimedia content may have severe consequences ranging from personal and brand reputation damage to widespread panic among civilians in the case of natural disasters.

It becomes clear that the availability of methods and tools for automatically assessing the veracity and authenticity of multimedia content published online is of primary importance for ensuring reliable and objective information of the public. Yet, developing such methods in the era of pervasive multimedia capturing and sharing presents a set of unique challenges. Notably, there has been an increasing trend for commoditization and sophistication of media editing software and services, sometimes to the point of being seamlessly intertwined in the media generation process, e.g. several digital filters are at the disposal of Instagram users immediately after the capturing of a photo, leading to the widespread online availability of digitally forged multimedia (be it for malicious or entertainment purposes). What is more, once a multimedia item is published (e.g. in the context of a breaking news story) and attracts attention, it is shared, commented and actively scrutinized by a diverse community of online users, giving rise to new opportunities for gathering insights regarding its veracity. Leveraging such content and its surrounding online context holds the potential for new effective means of verification. What is more, novel computing paradigms putting the human-in-the-loop, e.g. crowdsourcing and collaborative information management platforms, offer new opportunities for leveraging human intelligence at scale for tasks that are hardly solvable by existing algorithmic solutions.

To this end, the first Workshop on Web Multimedia Verification (#WeMuV2015) aims to highlight the research challenges and new problems arising in the emerging setting of Social and Mobile Multimedia and calls for new approaches, studies and evaluation methodologies and resources that could contribute to more effectively address the research challenges at hand. If you are interested in submitting, please have a look into the [topics of interest](#) and the [submission guidelines](#).

Supported by:



IMPORTANT DATES

Submission: 20 March 2015
04 April 2015
Notification: 20 April 2015
Camera-ready: 14 May 2015
Workshop Day: 29 June 2015

87

DAYS SINCE
PUBLISHED

Presentation of MAVEN at the European Researchers Night 2014





Università
di Cagliari

Pattern Recognition and Applications Lab
<http://pralab.diee.unica.it>



Dipartimento di Ingegneria Elettronica



Direttore del laboratorio: Prof. Fabio Roli
rol@diee.unica.it



Autenticazioni biometriche e Liveness detection

Soluzioni per l'autenticazione e il riconoscimento biometrico, basate su volti e impronte digitali, resistenti a tentativi di falsificazione e spoofing



Sistemi biometrici multimodali
Verifica dell'identità personale basata sulla biometria del volto e delle impronte digitali



Rilevazione di impronte false
Strumenti basati sulla rilevazione della vitalità (liveness detection)



Rilevazione di volti falsificati
Analisi movimento, tessitura e vitalità di immagini di volti, per rilevare volti falsificati (foto o maschere)

Contatti: Dott. Gianluca Marciali marciali@diee.unica.it

PROGETTI
Tabula Rasa (EU, 7th FP)
Trusted Biometrics under Spoofing Attacks
<http://www.tabularasa-eu-project.org>



Videosorveglianza intelligente

Person re-identification: riconoscimento di una persona nei filmati ripresi da diverse videocamere di una rete di videosorveglianza

Scenari applicativi: tracciamento automatico dei movimenti (on-line), recupero dei filmati contenenti una persona d'interesse (off-line)



Text-based people search: recupero di filmati contenenti persone in base a una descrizione testuale del loro abbigliamento (es. "persona con maglione rosso e pantaloni blu")

Scenari applicativi: indagini forensi



Contatti: Prof. Giorgio Lunera lunera@diee.unica.it

Content-based Image Retrieval

Sistemi interattivi per l'interrogazione di archivi multimediali

Basati su un esempio fornito dall'utente, raffino la ricerca seguendo le indicazioni fornite dallo stesso utente sulla rilevanza dei documenti recuperati

Protocollo: Image Hunter
Demo on-line basata su immagini tratte dalla Sardegna Digital Library:
<http://prag.diee.unica.it/amlab/WH>

Progetti:
MAVEN (EU, 7th FP)
<http://www.maven-project.eu/>





Contatti: Dott. Davide Arù davide.aru@diee.unica.it

Sicurezza informatica



Sicurezza del Web
Sicurezza di server e applicazioni Web: rilevazione di attacchi (trojan, spy, script, SQL injection)

Sicurezza degli utenti Internet: rilevazione di reti fast flux usate per tutte on-line (botnets, phishing, scam, malware, ...) e applicazioni per cellulari

Contatti: Prof. Giorgio Giacinto giacinto@diee.unica.it



Cyber intelligence
Soluzioni avanzate per la cyber intelligence basate su:
- information fusion
- data analytics
- security intelligence



Rilevazione di malware
Strumenti basati su algoritmi di apprendimento automatico e intelligenza artificiale, per l'individuazione di malware (programmi che accedono illegalmente a PC, cellulari o tablet, attraverso pagine Web, documenti PDF, Flash, Javascript, e applicazioni per cellulari)

PROGETTI
CyberROAD (EU, 7th FP)
Development of the Cybercrime and Cyberterrorism Research Roadmap
<http://pralab.diee.unica.it/CyberRoad>

ILBuster (EU, DG-HOME, Prevention of and Fight against Crime)
cluster of ILegit contents spread by malicious computer incidents
<http://ilbuster-project.eu/>

STATA (Sardinia Research, azioni cluster, POR Sardegna FESR 2007/2013)
Sicurezza on Sistemi IT contro attacchi informatici maligni
<http://stata.diee.unica.it/>




MAVEN presentation at LawTech Europe Congress



MAVEN presentation at S-Five Workshop



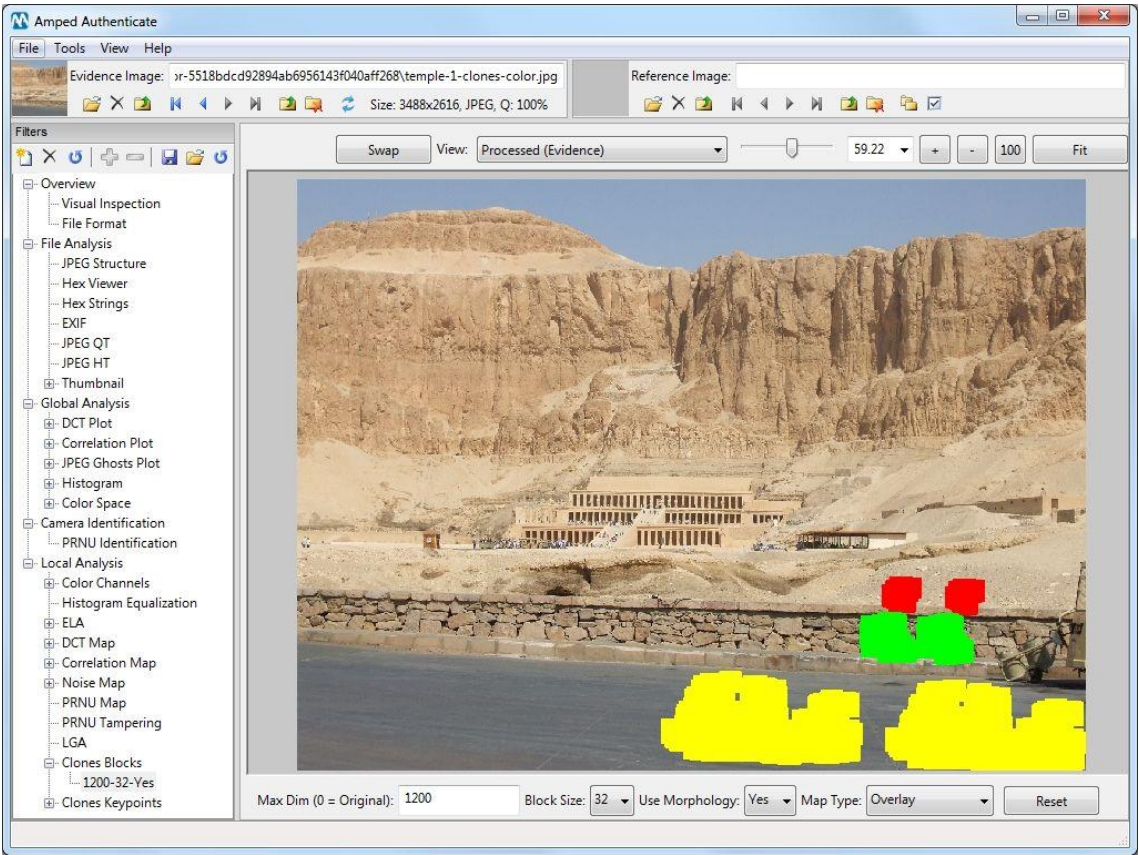
MAVEN presentation at Forensics Europe 2015

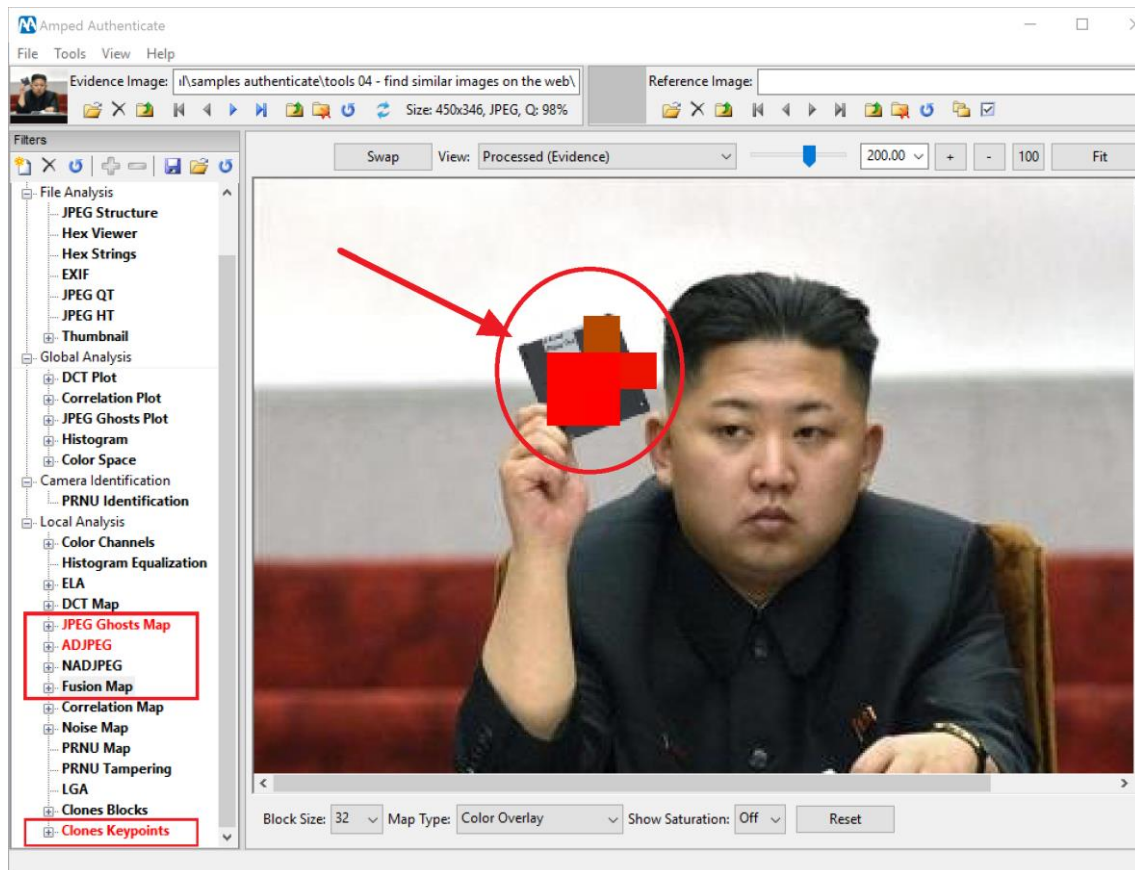


MAVEN presentation at the Entrepreneurial panel at the University of Chicago



Snapshots of AMPED's Authenticate product with MAVEN forensics tools integrated

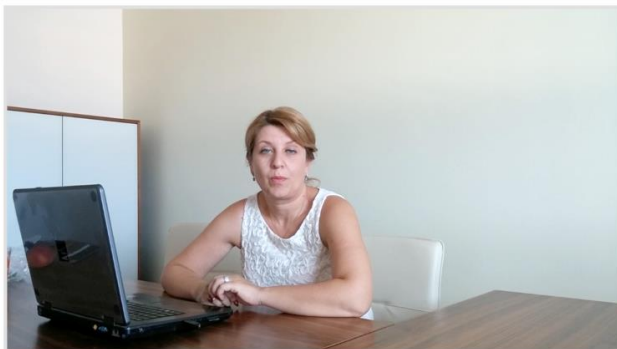




Snapshots from the videos prepared within the MAVEN project

What is the Maven project?

Luis Perez Freire - Project Coordinator
Executive Director, Gradiant - Vigo (Spain)



What is Arthaus?

Borjanka Nikolova

Arthaus Manager - Skopje (Macedonia)

Arthaus
IT solutions for your business

maven
MAKING BUSINESS EASIER



What is Taiger?

Carlos Ruiz

R & D Director Taiger - Madrid (Spain)



maven
MAKING BUSINESS EASIER





What is Amped?

Martino Jerian

Ceo Amped Software - Trieste (Italy)



What is Xtream?

Maximino Álvarez

CEO Xtream - Madrid (Spain)





MAVEN Project



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