

InVID - Verification of Social Media Video Content for the News Industry



Issue 2

November 2017

InVID project  <http://www.invid-project.eu>

Welcome!

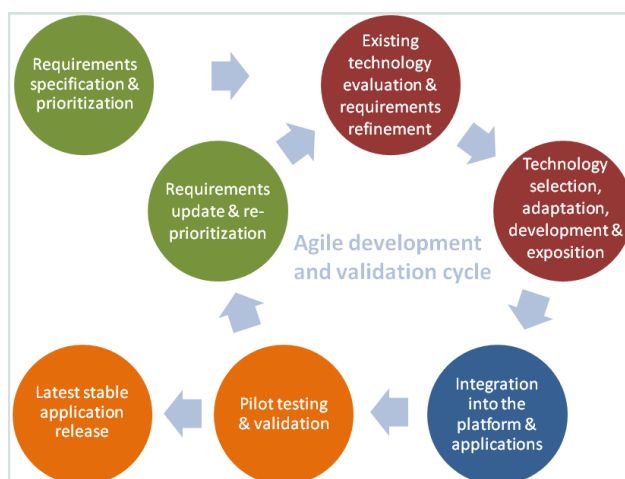
We would like to welcome you to the second issue of the InVID Newsletter. The aim of this issue is to inform the community, our readers and supporters, about the developed tools and applications for media collection and verification. Initially, we outline the adopted software development methodology and the progress made so far. Subsequently, we present our latest advances over a set of individual technologies for media collection, analysis, retrieval and rights management, and we introduce the developed InVID prototypes, namely, the Visual Analytics Dashboard, the Verification Plugin, the Verification Application and the Mobile Application. Following, we provide information about our recent dissemination activities, and the impact that these activities and the InVID prototypes have on the media and the news verification community. The current issue ends with details about the InVID consortium and how to get in contact with us.

Progress Summary

Being fully aligned with the time-plan of the project, the InVID consortium has developed, tested and validated a number of individual technologies and a set of integrated tools that address different aspects of the journalistic workflows for the verification of user-generated content. The development of each software component and the integration of these components into complete tools, was based on an agile development and innovation methodology which guides the entire work-plan. This methodology was chosen to ensure quick development of technologies that meet the analysis requirements and fulfill the innovation goals of the project.

According to this methodology, the members of the InVID consortium have worked on four successive development and validation cycles so far, which include (re-)prioritizing the industrial requirements; assessing, selecting and adapting individual technologies that best address these requirements; exposing and integrating them to the InVID platform and applications; pilot-testing and validating the updated platform and applications; and repeating this cycle by re-prioritizing industry requirements in the light of the new status of platform and application development. The outcomes of this procedure include:

- A set of individual tools for media collection, analysis, indexing, retrieval and rights management;
- A number of integrated applications that address different parts of the media collection and verification process.



The different steps of the agile methodology for the development and validation of the InVID platform and applications.

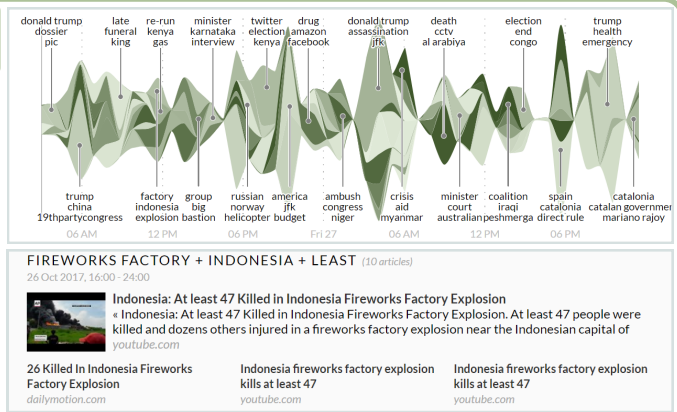
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Latest InVID Technologies

Story Detection

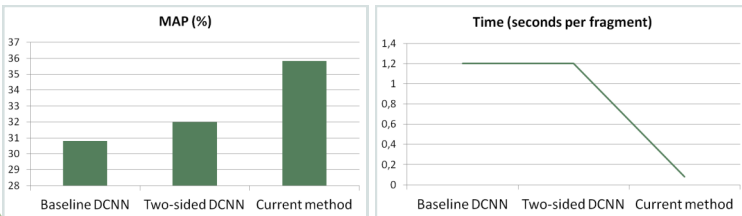
The InVID story detection component aims to efficiently and effectively find candidate videos for the journalistic verification process. The story detection algorithm was fine-tuned to extract news stories from real-time Twitter streams. The results can be explored via a new "streamgraph" visualization (top figure). Stories are also used to dynamically direct a social media retrieval process, so that relevant videos are collected for the current news. The Story View on the Visual Analytics Dashboard (see p. 4) provides an intuitive means to browse the stories in the collected videos and explore the top videos for each story (bottom figure). In this way, the story detection component supports journalists and other users in finding news-related social media video as a prior step to performing verification.



The goal of this analysis module is to segment a user-generated-video into visually and temporally coherent fragments (called subshots), and to annotate these fragments with human-interpretable high-level concepts (such as building, car, daytime) that describe the visual content of each fragment. Using deep learning technologies, the video annotation component predicts the concept labels for each video fragment in a fast and highly accurate manner. The method initially used in InVID combined the typical deep convolutional neural networks (DCNNs) with fine-tuning strategies. This

Video Fragmentation & Annotation

method was first improved by replacing the baseline DCNNs with two-sided DCNN architecture that incorporates concept correlations and multi-task learning. Then, the above was again transformed to a more compact single-side architecture. The applied improvements increased the accuracy of the video annotation component (measured by Mean Average Precision-MAP) from 30.8% to 35.81% (left figure), while the needed processing time was reduced from 1.2 to 0.8 seconds per fragment (right figure).



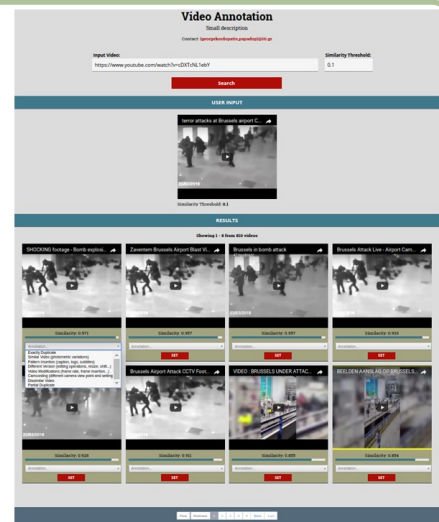
Near-duplicate Video Detection

This technology aims to find near-duplicates of a given video, aiming to assist journalists to detect and evaluate previous occurrence(s) of a news-worthy video.

The retrieval of similar videos from the InVID index is performed by assessing their visual similarity with the query video, based on state-of-art deep learning methods. For a given video (currently supported platforms include YouTube, Dailymotion and Twitter) the underlying service returns a ranked list

of near-duplicates, where the top entry corresponds to the most similar near-duplicate and the last entry to the least similar one (see figure). Moreover, it integrates functionalities for the localization of the query video in the retrieved near-duplicates, that allow to specify which part (s) were found to be similar to the query video.

The service provides the needed functionalities for building, updating and querying the InVID index of video content via its REST API.



Latest InVID Technologies

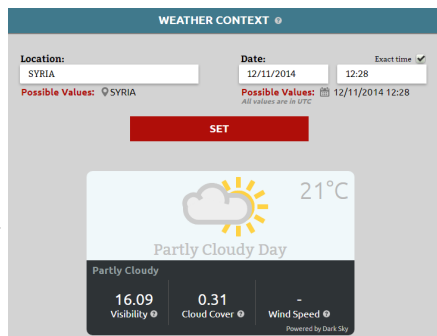
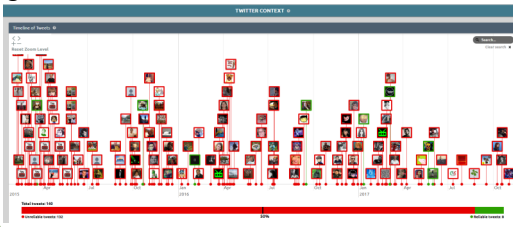
Video Logo Detection

When a journalist comes across a Web video or image relating to a news story, being able to know its provenance could be critical in identifying potential biases or misrepresentations of the truth. Nowadays, besides well-known news agencies, various groups - from warring factions to independent news organizations - use their own logos in the content they distribute. The InVID logo detection component aims to detect any logos present in videos or images and provide the name of the related organization or channel. Using Deep Learning technologies, the component is already able to recognize the logos of more than 150 organizations, and to return the name of the organization plus a link to a related Wikipedia article. The component further allows users to submit additional logos for the system to learn. An online demonstration with examples of use can be found at: <http://logos.iti.gr>



This component analyzes the online context of videos aiming to isolate and present to the user pieces of information that assist video's verification. The underlying service supports videos from the YouTube, Facebook and Twitter platforms. Extending the information collected by the first release of the tool (i.e. video/owner metadata, users' comments), the latest version provides data about the weather conditions at the time and place where the video was supposedly captured (see figure on the right), thus, offering another means of video verification to the users. Moreover, it gathers tweets related to the evaluated video and presents them in a timeline-based view. Each of these tweets is analysed by the integrated machine learning algorithm, which offers a color-based (using a green or red bounding-box as shown in figure on the left) indication of whether the tweet is credible or not. The tool is publicly available at: <http://caa.iti.gr>

Video Context Analysis



Video Rights Management

This service aims to assist journalists through the process of clearing the copyright of user-generated-content, in order to enable the reuse of this content. The module guides the journalists through recommended copyright management workflows and supports videos made available through the YouTube, Twitter and Facebook platforms. In all cases, a summary of the default reuse terms, as defined by each social network, is provided (see right image). If other kinds of reuse are necessary, the underlying service facilitates the generation of a custom reuse request (see left image) and allows to track the interactions between the journalists and the content owner, which include authorship confirmation and copyright agreements that define the terms for content reuse. The service can be tested at <https://rights.invid.udl.cat> and full access can be requested at invid@udl.cat

Facebook License

- ✔ **Embed**
To insert media in Web pages without requiring authorisation from the content owner. It is based on the rights already granted to Facebook by the owner. Therefore, the embedding should be done following these [instructions](#)
- ✘ **Other Uses**
Any other kinds of reuse, like re-broadcasting or re-publishing it.

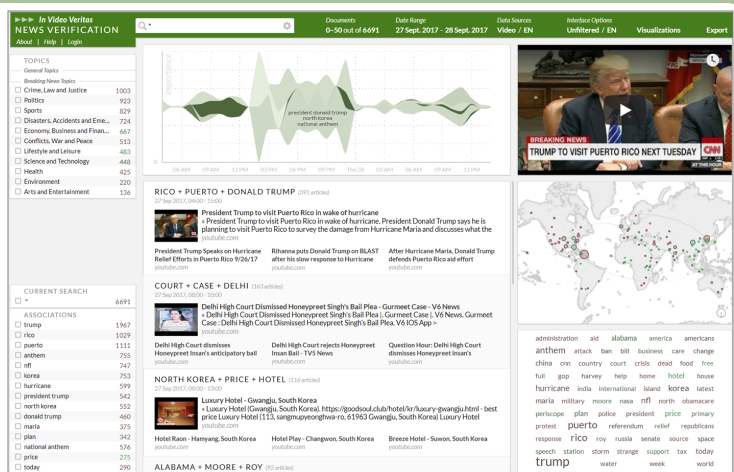
Latest InVID Prototypes

InVID Visual Analytics Dashboard

The InVID Visual Analytics Dashboard is an integrated tool for newsworthy video collection and management.

It supports story detection across several social media channels (including Twitter, Youtube, DailyMotion and Vimeo). Detected emerging stories are presented also in terms of their geographic distribution, allowing the users to gain more insights about the way information was transferred over the Web. Moreover, for each story the tool performs a story-based newsworthy video identification.

The entire set of collected media undergoes an automatic metadata extraction and indexing process, and the available information (including both the collected media and the extracted metadata) is shown to the user through the context exploration and visualization functionalities of the user interface of the tool. Furthermore, this in-

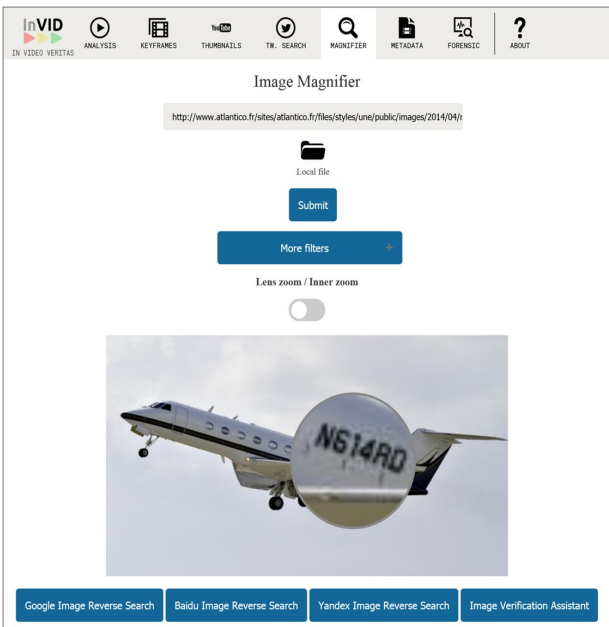


Screenshot of the InVID Visual Analytics Dashboard.

formation can be exported in PDF format using the automated report generation mechanism of the tool.

The identified newsworthy videos are presented to the users via the embedded playback of the tool, either at the video-level or at a more fine-grained, video-fragment-level. Last but not least, a set of user-selected videos can be submitted for verification through the Verification Application of InVID.

Accessible at: <https://invid.weblyzard.com>



The image magnifier tool of the InVID Verification Plugin.

More than 1000 experts are currently using the tool for debunking fake news videos shared online! Get the tool for free from: <http://www.invid-project.eu/verify>

InVID Verification Plugin

The InVID Verification Plugin is an integrated browser extension that can assist journalists and other media professionals on verifying selected newsworthy videos. The tool allows the users to:

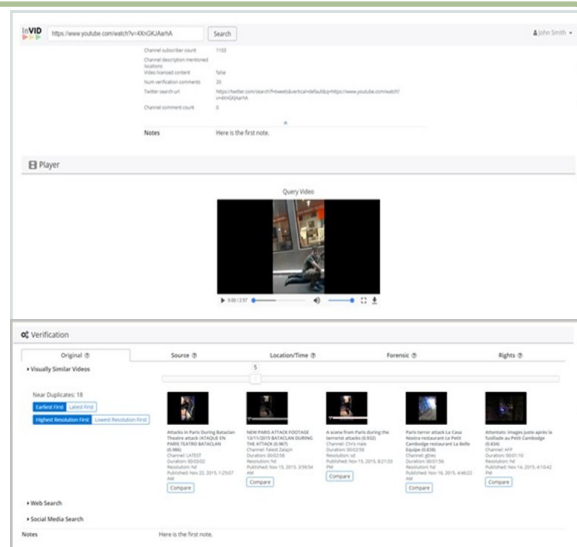
- Check for any prior use of a video by performing reverse video search on the Web using both YouTube thumbnails and a rich set of InVID-extracted keyframes;
- Check contextual information about a video through mechanisms that support social-media-based contextual analysis, extraction of location, time and other video metadata, and keyframe/image inspection through a digital magnifying glass;
- Check image forensics to get clues about potential tampering of the visual content, with the help of a set of integrated keyframe/image forensic filters;
- Find more related videos around a news story, via a user-friendly interface that enables advanced Twitter search using a time interval up to 1'.

Latest InVID Prototypes

InVID Verification Application

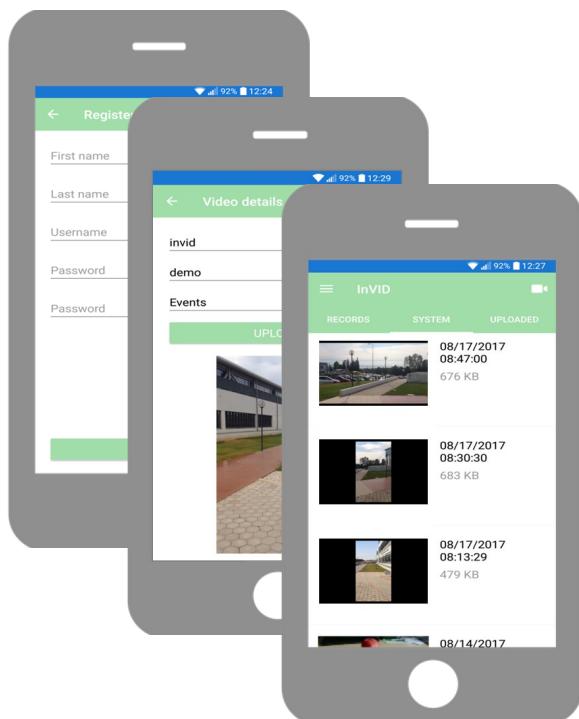
The InVID Verification Application is an integrated technology for advanced video verification, offering additional verification functionalities that go beyond those of the free Verification Plugin. Additionally to what the free browser extension supports, this tool enables the user to:

- Check any prior video use of a video by applying reverse video search also in the InVID repository using advanced near-duplicate video detection methods, and to perform a careful inspection of the retrieved duplicates by parallel playback of query and duplicate video;
- Check the video's origin and rights through integrated tools that perform video logo detection and rights management, allowing the user to assess the trustworthiness of the video source and to get informed about the rights for re-use;
- Check video forensics to get insights about potential tampering of the video content, with the help of advanced video forensic filters and frame-level video inspection in the player;



Example of using the near duplicate video detection component of the InVID Verification Application.

- Check additional contextual information about a video, assessing also historical weather data that can give more clues regarding the veracity of a video.



Example of different interfaces of the InVID Mobile Application.

InVID Mobile Application

The InVID Mobile Application is a native iOS and Android application which is used to provide trusted video contributions.

This tool allows authorized users (such as the subscribers of a news agency or media organization) to capture videos of breaking or evolving stories, which are automatically enriched with time, location and device metadata. Moreover it makes possible the annotation of the captured videos using both free text and a set of pre-selected labels, enabling the users to provide more details about the recorded event. Finally, the captured trustworthy and metadata-enriched videos can be submitted to the content management systems of news agencies and media organizations, in order to be incorporated in their news flow.

With the procedure described above, users who happen to be in the right place at the right time, can act as reporters, contributing to the time-efficient and precise coverage of a breaking news story.

InVID Dissemination Activities

InVID's Presence in Industrial Events

- [Big Data Value Association Valencia Summit](#), Valencia, Spain, December 1, 2016
- [News Impact Summit](#), Amsterdam, the Netherlands, December 13, 2016
- [EBU Verification Workshop](#), Lisbon, Portugal, January 23, 2017
- [International Journalism Festival 2017](#), Perugia, Italy, April 7, 2017
- [E-Day 2017](#), Vienna, Austria, April 12, 2017
- [NAB Show 2017](#), Las Vegas, USA, April 24-27, 2017
- [Futur en Seine 2017](#), Paris, France, June 8-10, 2017
- [IFA 2017](#), Berlin, Germany, September 1-6, 2017

Over the last year the InVID project and results were promoted, among others, in the following industrial events:

- [WAN-IFRA Medialab Day](#) Bordeaux, France, September 8-9, 2017
- [Brussels DisinfoLab](#), Brussels, Belgium, September 14, 2017
- [IBC 2017](#), Amsterdam, the Netherlands, September 15-19, 2017
- [49th FIBEP World Media Intelligence Congress](#), Berlin, Germany, October 4-6, 2017
- [Investors Meeting](#) for Media Innovators, London, UK, October 5, 2017
- [Digital Media World 2017](#), Berlin, Germany, October 10-12, 2017

The InVID presentations / demonstrations at these events are available on the InVID SlideShare channel (https://www.slideshare.net/InVID_EU) and the InVID website (<http://www.invid-project.eu/presentations>)

The InVID project and its outputs were covered, among others, in the following channels:

- [FujoMedia \(Institute for Future Media and Journalism in Dublin\)](#) on July 5th, 2017
- [Winbuzzer](#) on July 7th, 2017
- [The Next Web](#) on July 8th, 2017
- [Wired Italia](#) on July 10th, 2017
- [ITMedia Japan \(Softbank Group\)](#) on July 10th, 2017
- [Mediacentar Sarajevo](#) on July 12th, 2017
- [Focus Italia magazine](#) on July 13th, 2017
- [American Press Institute; The Week in Fact Checking](#) on July 13th, 2017

Media Coverage About InVID

- [Mediashift.org](#) on July 26th, 2017
- [Media Sapiens Ukraine \(taken from the above Mediashift\)](#) on July 26th, 2017
- [StopFake.org Spanish](#) on July 29th, 2017
- [Parallaxi Mag](#) on August 8th, 2017
- [Mediakwest \(Professional video and TV magazine\)](#) Full-page article on InVID on page 94; September-October 2017, #23
- [WAN-IFRA blog World news publishing focus](#) Report on InVID presentation in #DCXExpo Berlin, Oct. 12, 2017

Published InVID Results

Scientific results of InVID have been published or accepted for publication in 2 peer-reviewed international journals (**Image & Vision Computing Journal**, **IEEE Transactions on Multimedia**) and 9 peer-reviewed international conference proceedings (**IEEE Int. Conf. on Image Processing 2016**, **ACM Multimedia 2016**, **Int. Conf. on MultiMedia Modeling 2017**, **SocialNLP workshop at European Chapter of the Association for Computational Linguistics 2017**, **ACM Int. Conf. on Multimedia Retrieval 2017**, **Int. Conf. on Computer Vision 2017**, **TRECVID 2017**, **Int. Conf. on Multimedia Modeling 2018**). InVID also organized the **1st Int. Workshop on Multimedia Verification (MuVer) at the ACM Multimedia Conference 2017**.

The InVID publications and datasets are available at:

- the InVID Community on Zenodo: <https://zenodo.org/communities/invid-h2020>
- the project website: <http://www.invid-project.eu/publications> & <http://www.invid-project.eu/invid-datasets>

The InVID Verification Plugin was released as open source under an MIT License via the GitHub page of InVID: <https://github.com/invideu/invid-verification-plugin>

Public Feedback on the Verification Plugin

Claire Wardle, First Draft News Research Director

Mark Frankel, head of Social Media at BBC

Claire Wardle @cward1e Follow

If you work in the verication space, this is a must-download. The Twitter search by minute functionality is incredibly helpful.



8:14 AM - 7 Jul 2017

10 Retweets 12 Likes

Mark Frankel @markfrankel29 Follow

If you're a UGC verification junkie this new "InVid" fake news video debunker chrome extension is REALLY USEFUL:



8:06 AM - 11 Jul 2017

2 Retweets 3 Likes

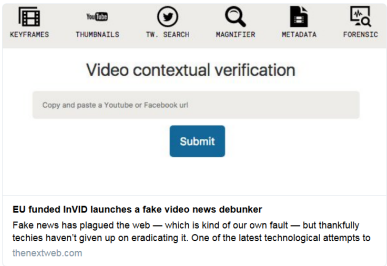
Dan Calderwood, head of multimedia of Times Group (SouthAfrica)

MediaEU - EC account on media pluralism and freedom

Peter Burger, researcher and lecturer in Journalism & New Media at Leiden Univ.

Dan Calderwood @dancalder Follow

installs chrome extension immediately >>> EU funded @InVID_EU launches a fake video news debunker

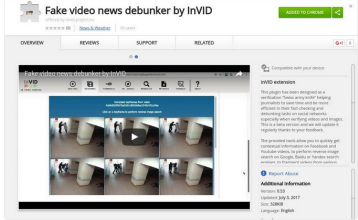


1:17 PM - 7 Jul 2017

7 Retweets 4 Likes

media.eu @MediaEU Follow

Check this out! A plugin to debunk fake news and to verify videos & images Beta version, by @InVID_EU chrome.google.com/webstore/detail/... #media



11:21 PM - 6 Jul 2017

21 Retweets 19 Likes

Peter Burger @JPeterBurger Follow

Is deze video of foto fake? Waar komt hij vandaan? Prachtig nieuw gereedschap voor factchecks: InVID (Chrome plugin) goo.gl/rgpac6



11:58 PM - 8 Jul 2017

11 Retweets 14 Likes

EAVI - European non-profit association on Media literacy

Sam Dubberley, manager @Amnesty's digital verification corps.

eavi EAVI Media Literacy @eavi Follow

Wow! This is super cool. Check out the fake video news debunker from @InVID_EU .



9:30 AM - 3 Jul 2017

4 Retweets 6 Likes

Sam Dubberley @samdubberley Follow

Nearly 100 videos to verify today. @InVID_EU plug-in proving invaluable to get through them speedily invid-project.eu/invid-verifica ... cc. @dteyssou



2:07 AM - 21 Jul 2017

8 Retweets 25 Likes

InVID Consortium

The list of the project partners with links to their official websites is given here.

A more detailed presentation of the InVID partners, with a description of their expertise and roles in the project can be found on the project website (<http://www.invid-project.eu/consortium>).

Find us online!

Web: <http://www.invid-project.eu>

Twitter: @InVID_EU

https://twitter.com/InVID_EU

LinkedIn: InVID Project

<https://www.linkedin.com/in/invid-project-1a712513b>

SlideShare: InVID Project

http://www.slideshare.net/InVID_EU

YouTube: InVID Project

<https://www.youtube.com/channel/UCFp4OyFkV7cwQsDLCFRyBJQ>

Zenodo: InVID H2020 Project

<https://zenodo.org/communities/invid-h2020>



Centre for Research & Technology Hellas - Information Technologies Institute
<http://www.iti.gr>



Modul Technology
<http://www.modultech.eu>



Universitat de Lleida
<http://www.udl.cat>



Exo Makina
<http://www.exomakina.fr>



webLizard Technology
<https://www.weblyzard.com>



Condat AG
<http://www.condat.de>



APA-IT Informations Technologie
<https://www.apa-it.at>



Agence France-Presse
<http://www.afp.com>



Deutsche Welle
<http://www.dw.com>

Project and Contact Details

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Full title: "In Video Veritas – Verification of Social Media Video Content for the News Industry"

Project identifier: H2020-687786

Start date: 1st January 2016

Duration: 36 months

Funding agency: The InVID project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 687786.

