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The LETSCROWD Newsletter

N° 3, November 2019

Law Enforcement agencies human factor methods and Toolkit for the Security and protection of CROWDs in mass gatherings

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LETSCROWD Newsletter 3. Editorial and project official video. November 2019

Dear Friend,

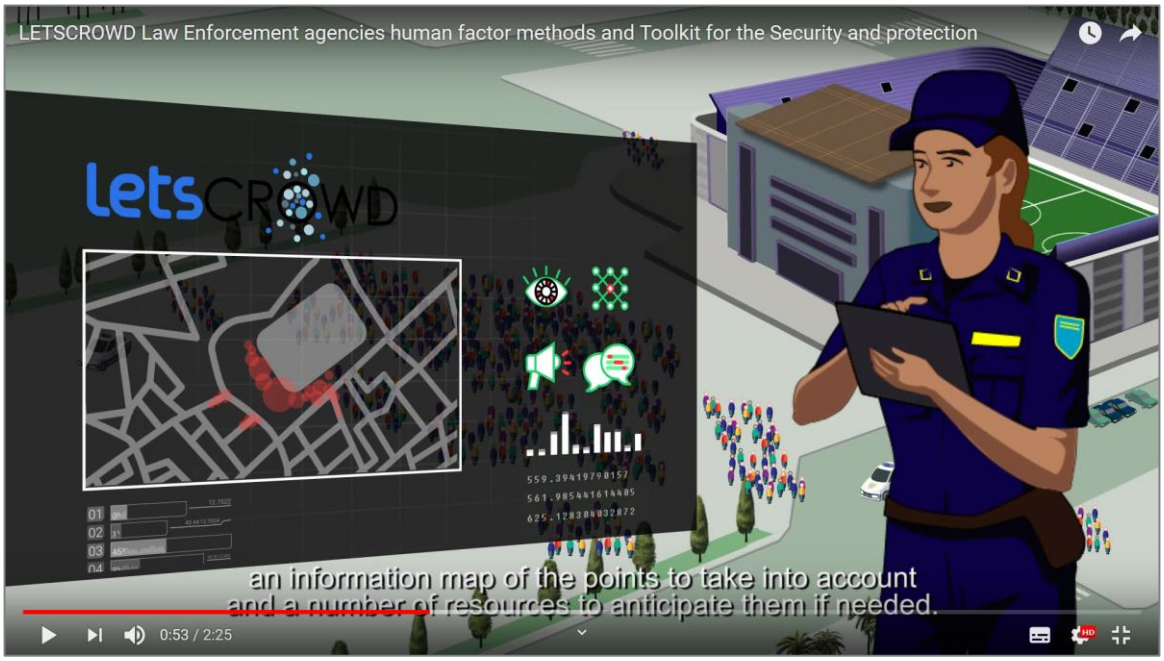
LETSCROWD is a project that developed an integrated system for crowd protection during mass gatherings, by providing a set of tools to Law Enforcement Agencies and security policy practitioners, including:

- a communication toolkit that aims at improving event organisers, security officers and first responders' crowd awareness and intercultural competences in the pre-event and execution phases of the events;
- a set of human centred softwares for LEAs, including real time crowd behaviour forecasting, semantic intelligence applied to social networks and the internet, and novel computer vision techniques;
- a dynamic risk assessment methodology for the protection of crowds during mass gatherings, centred on human factors, in order to effectively produce policies and deploy adequate solutions;
- a training package for LEAs, to enhance capabilities and skills in identification of suspicious signs in behaviour and appearance that might indicate a possible connection of an individual or group to intentional criminal or terrorist activity;
- a LETSCROWD Server, that aggregates and integrates the LETSCROWD existing tools.

With the recent conclusion of the LETSCROWD activities we are glad to share, through videos and infographics/presentation cards, part of the outcomes of the project with the community, and details on the functioning of developed tools.

We are sure you will find interesting the contents of this third newsletter, and hence we would like to invite you to read on.

LETSCROWD official video



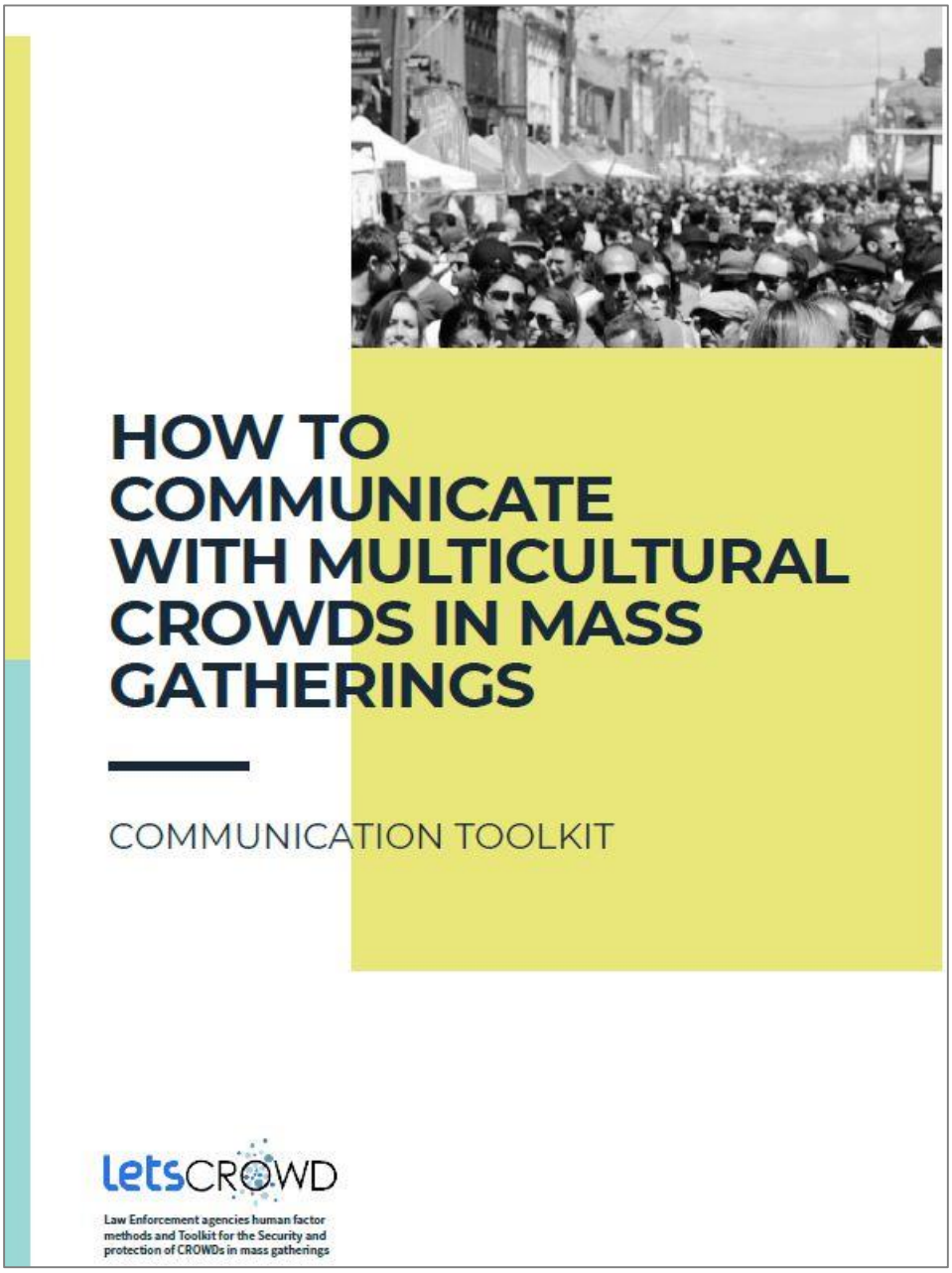
The video is available at:
https://letscrowd.eu/video

How to communicate with multicultural crowds in mass gatherings – The LETSCROWD Communication Toolkit (Toolcard and PDF Toolkit)

Alessia Golfetti, Sabina Giorgi - Deep Blue

LETSCROWD Communication Toolkit - Toolcard

LETSCROWD Communication Toolkit - PDF Toolkit



The PDF document (20,4 MB) is downloadable from:
https://letscrowd.eu/communication-toolkit

Deep Blue (DB) is a research and consultancy Italian SME, specialized in human factor, safety, security, validation and scientific dissemination. The company operates in contexts with high safety, security and resilience requirements, such as Transport, Healthcare and Energy.

https://dblue.it

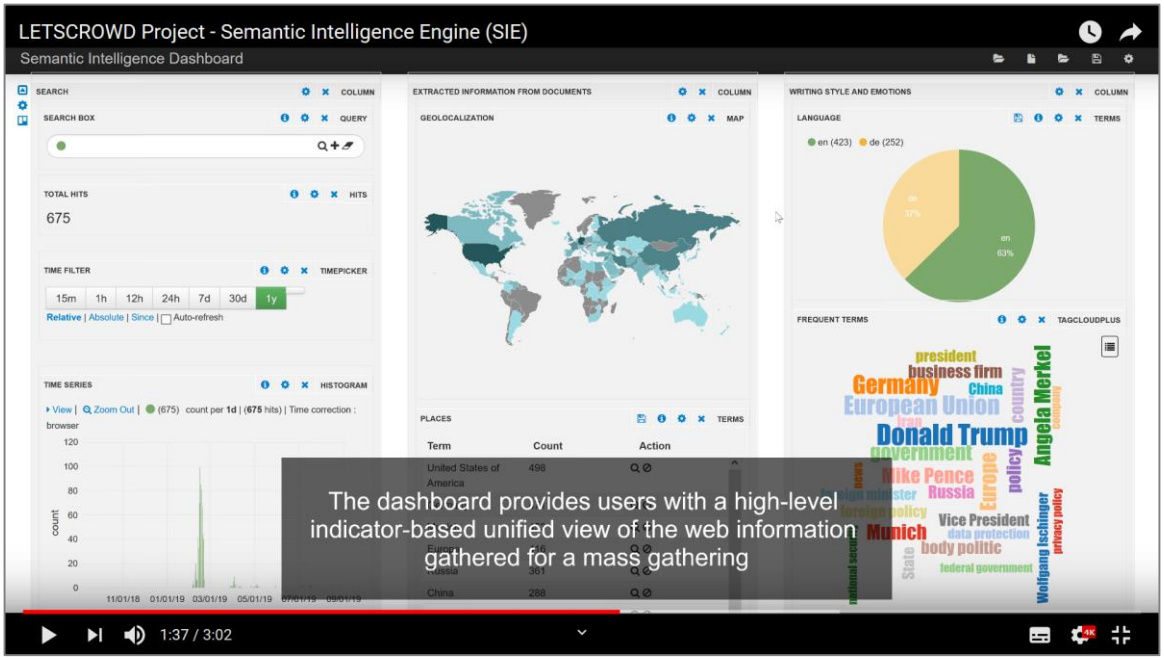
Deep Blue

Semantic Intelligence Engine – SIE (Toolcard and video)

Andres Garcia-Silva, Jose Manuel Gomez-Perez, Cristian Berrìo Aroca - Expert System Spain;
Alessio Mulas, Davide Ariu - Pluribus One

LETSCROWD Semantic Intelligence Engine - Toolcard

LETSCROWD Semantic Intelligence Engine - Video



The video is available at:
https://letscrowd.eu/sie-video

Founded in 1989, Expert System S.p.A. is a big player in the big data analytics and semantic intelligence market that has developed a proprietary state-of-the-art software technology that understands the meaning of written language. Expert System is headquartered in Modena, Italy and has branches in US, UK, France, Spain and Germany. Expert System participates in LETSCROWD through the Spanish branch, specialized in NLP and semantic technologies.
www.expertsystem.com

Expert System S.p.A.

Linked third party of PRA Lab - UNICA (the University of Cagliari), Pluribus One S.r.l is a research-intensive company based in Italy focused on providing innovative solutions for cyber security, machine vision, and other data-driven applications. Pluribus One is involved in LETSCROWD in the development of the focused crawling engine for the COGITO semantic engine, and in the use cases on cyber attacks and cyber crime.
www.pluribus-one.it

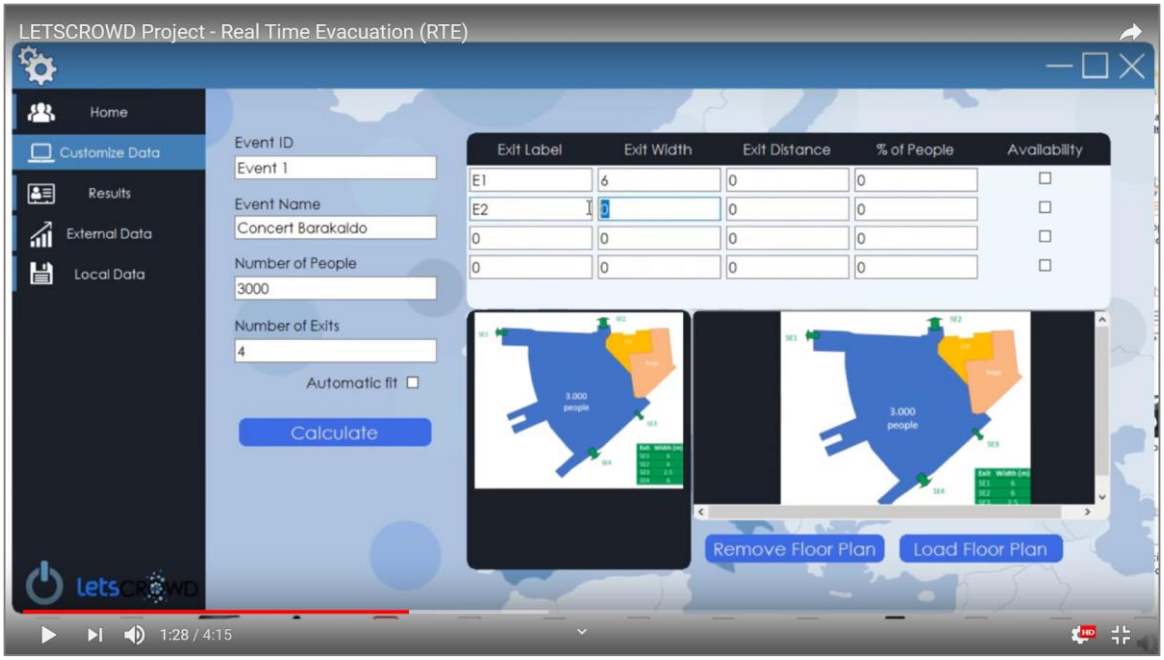
Plurbus One S.r.l

Real Time Evacuation – RTE (Toolcard and video)

Arturo Cuesta, Daniel Alvear, Orlando Abreu - University of Cantabria

LETSCROWD Real Time Evacuation - Toolcard

LETSCROWD Real Time Evacuation - Video



The video is available at:
https://letscrowd.eu/rte-video

For almost 20 years the Research Group GIDAI – Fire Safety – Research and Technology University of Cantabria has been undertaking intensive research, technology transfer and training activities in the fields of human behavior in emergency conditions and fire science as well as the dissemination of relevant information to society in order to improve fire safety which has led it to become a national and international reference in this scientific field of expertise.
http://web.unican.es

Research Group GIDAI – University of Cantabria

Crowd Modelling and Planning Tool – CMPT (Toolcard and video)

Dan Jeffery, Paul Townsend - Crowd Dynamics

LETSCROWD Crowd Modelling and Planning Tool - Toolcard

LETSCROWD tool presentation cards

LETSCROWD - Law Enforcement agencies human factor methods and Toolkit for the Security and protection of CROWDs in mass gatherings - aims to develop an integrated system for crowd protection during mass gatherings, by providing the following to security policy practitioners:

A **dynamic risk assessment methodology for the protection of crowds during mass gatherings** centred on human factors in order to effectively produce policies and deploy adequate solutions.

A set of **human centred tools for Law Enforcement Agencies (LEAs)**, including real time crowd behaviour forecasting, innovative communication procedures, semantic intelligence applied to social networks and the internet, computer vision techniques.

A **policy making toolkit** for the long-term and strategic decision making of **security policy makers**, including a database of empirical data, statistics and an analytical tool for security policies modelling.

letsCROWD

Human Factors

European Security Model

Security and Protection of Crowds

LETSCROWD Crowd Modelling and Planning Tool

The CMPT is a collection of advanced crowd simulations that allow enforcement agencies to analyse crowd behavior at mass gatherings for planning, training or operational uses.

When should the CMPT be used?
- Before a mass gathering occurs to understand likely situation and risk, to plan or test LEA responses to potential incidents, to plan or test crowd management strategies.
- During operation of a mass gathering, in real-time to aid operational decision making by providing a forecast of crowd behavior.

What should the CMPT model?
- Crowd movement patterns and density levels that are expected at an event.
- Evacuation of the mass gathering.
- Crowd management strategies (e.g. rerouting crowds).
- LEA intervention tactics.
- Communication strategies (placement of information sources).

IN SHORT: Software to plan for crowds attending a mass gathering, to simulate the crowd movement in normal and emergency situations, and to display the results in understandable ways, in 3D.

VIDEO: youtu.be/HoP_IkOvq_U

WHO IS THIS TOOL FOR?
The tool is for use by LEAs who wish to assess crowds at events and mass gatherings. It can also be used by expert advisors such as security companies, event organisers or engineers and architects.

WHAT IS THE ADDED VALUE OR BENEFITS FOR LEAS OPERATORS AND OTHER STAKEHOLDERS?
The added value of the tool is that crowd movements, area capacities, strategies for intervention or management can all be tested in advance of an event to enable prevention of crowd related incidents. This is also true during the event, where strategies to move, disperse or evacuate crowds can be simulated and tested to get better awareness of potential impact *before* implementation. This will allow much better situational awareness through prediction and lead to better decision making in prevention of unwanted accidents.

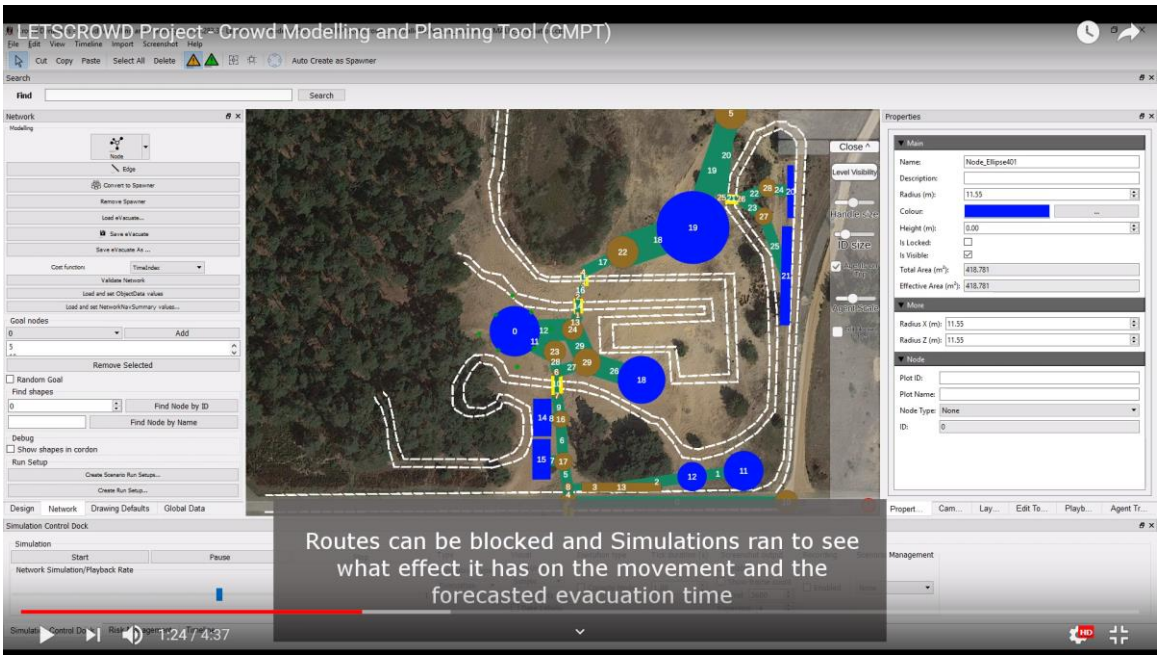
WHEN SHOULD THE TOOL BE USED?
The tool is useful throughout all phases of an event, even for unplanned events such as spontaneous protests. It would normally be used to plan for crowds at mass gatherings, testing scenarios before the event happens, assessing consequences of risk to the crowd of certain management techniques etc. It would then be used during operations to test certain scenarios like closing streets, the potential impact of police crowd control tactics or crowd management as it changes through the event. Post event, it can be used to assess what could have been improved, why crowd movement was impeded in different situations.

www.letscrowd.eu
linkedin.com/in/lets-crowd-project
@LetsCrowd

letsCROWD

This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under the grant agreement N° 740466.

LETSCROWD Crowd Modelling and Planning Tool - Video



The video is available at:
https://letscrowd.eu/cmpt-video

Crowd Dynamics International Ltd has a widespread client base and global reputation. Over many years, our experienced team of specialists has fine-tuned the science of Crowd Dynamics. The company's software developers have turned this specialist knowledge into practical modelling packages, with the goal of maximising capacity, space and efficiency while minimising risk. Such tools include real-time analysis of crowds.

http://www.crowddynamics.com

Crowd Dynamics International Limited

Human Centred Computer Vision Tool – HCV (Toolcard and 3 videos)

Giorgio Fumera, Rita Delussu, Lorenzo Putzu, Matteo Mauri - PRA Lab, University of Cagliari

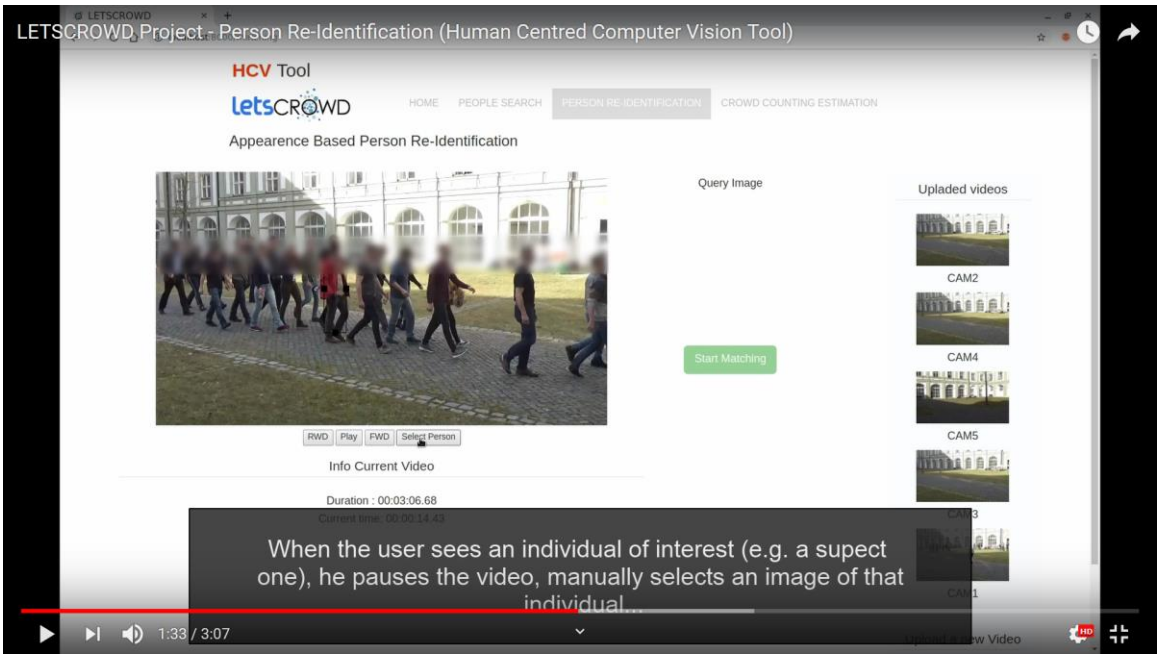
LETSCROWD Human Centred Computer Vision Tool - Toolcard

Three specific prototype tools have been developed as part of the HCV tool: appearance-based person re-identification, attribute-based people search, crowd counting and density estimation.

Appearance-based person re-identification

Appearance-based person re-identification systems can support LEA operators and forensic investigators by automatically **retrieving images of an individual of interest based on clothing appearance** to a query image of the same individual manually selected by the user from a video frame.

LETSCROWD Person Re-Identification (Human Centred Computer Vision Tool) - Video



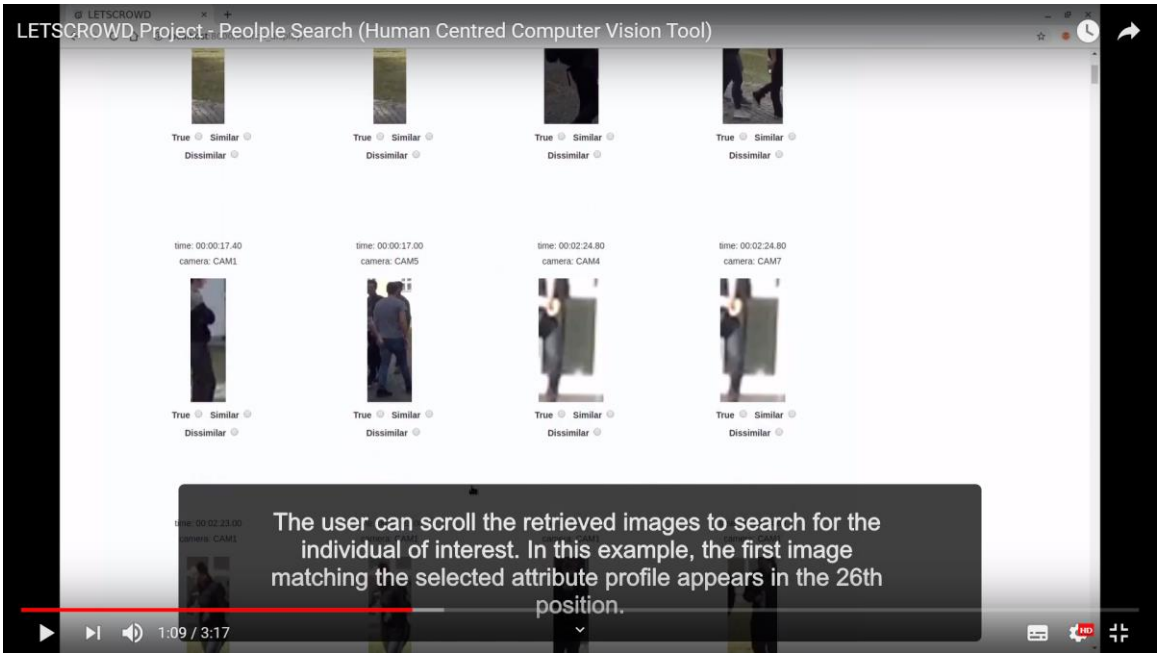
The video is available at:
https://letscrowd.eu/hcv-re-id-video

This video is a short demo with blurred contents, due to privacy reasons. A longer version of the video, without obfuscated contents, is available for scientific purposes. **Contact us** for more information.

Attribute-based people search

Attribute-based people search systems allow the user to input the attribute profile of an individual of interest in terms of a predefined set of attributes, such as the colours of upper and lower body clothing, gender, and carried items, and then automatically retrieve images of individuals exhibiting a similar attribute profile.

LETSCROWD People Search (Human Centred Computer Vision Tool) - Video



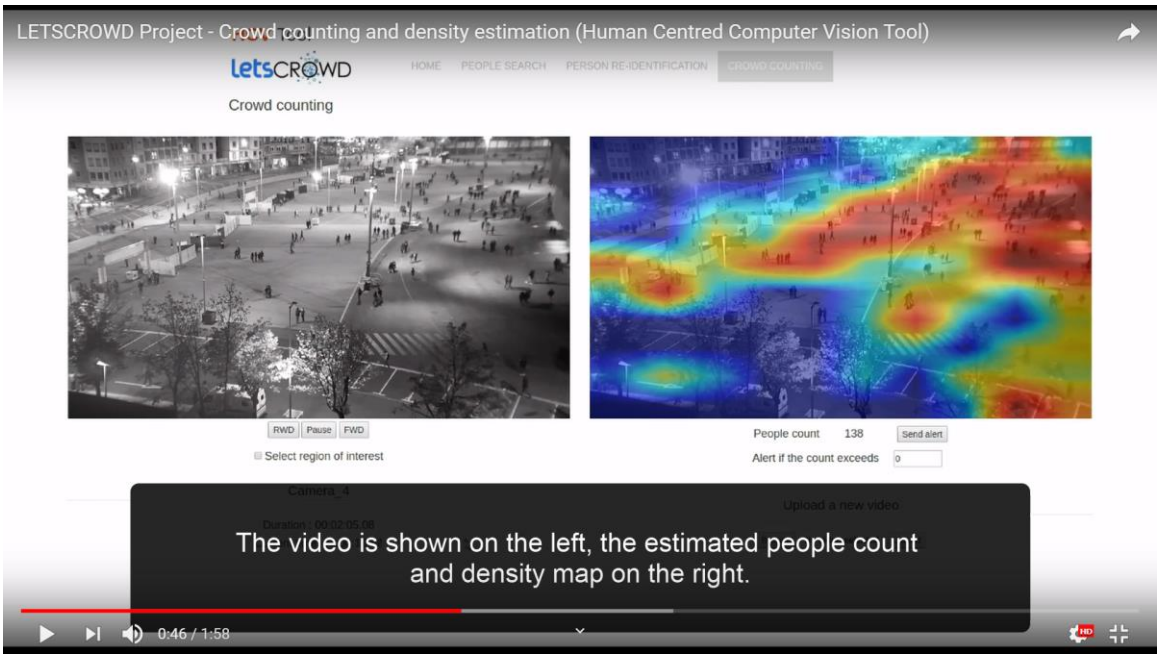
The video is available at:
https://letscrowd.eu/hcv-people-search-video

This video is a short demo with blurred contents, due to privacy reasons. A longer version of the video, without obfuscated contents, is available for scientific purposes. **Contact us** for more information.

Crowd counting and density estimation

In the LETSCROWD project **a crowd density estimation tool has been developed to provide a real-time estimate of the number of people in a scene**, or in a user-defined region of interest inside a scene. This kind of tool can also raise alerts when the estimated number of people exceeds a user-defined threshold, and when anomalous and potentially dangerous behaviours are automatically detected, such as a sudden increase or decrease of the estimated number of people.

LETSCROWD Crowd Counting and density estimation (Human Centred Computer Vision Tool) - Video



The video is available at:
https://letscrowd.eu/hcv-crowd-counting-video

PRA Lab works on the development of next generation pattern recognition systems for real applications such as video surveillance, biometric authentication, text categorization, and intrusion detection in computer networks. PRA mission is to address fundamental issues for the development of future pattern recognition systems, in the context of real applications.
http://pralab.diee.unica.it/en

PRA Lab - University of Cagliari

Dynamic Risk Assessment – DRA (Toolcard)

Carlo Dambra - ZenaByte

LETSCROWD Dynamic Risk Assessment - Toolcard

According to Industry 4.0 definitions, ZenaByte is an innovative spin-off of the DIBRIS Department of the University of Genoa whose main object is the "Development of innovative methodologies for intelligent management, interpretation and extraction of knowledge from data". ZenaByte birth is based on the research activities, consolidated in several European projects and in collaboration with major international companies, of its founding members.
https://www.zenabyte.com

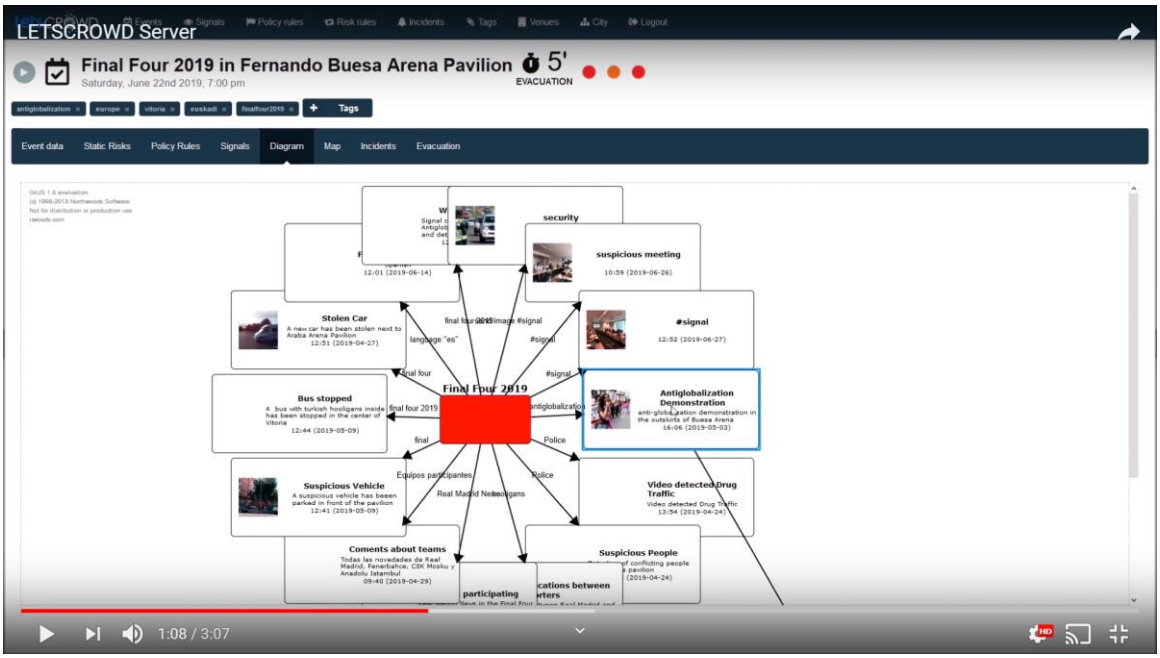
ZenaByte S.r.l

LETSCROWD Server (Toolcard and Video)

Jordi Arias Martí - Etra I+D

LETSCROWD Server - Toolcard

LETSCROWD Server - Video



The video is available at:
https://letscrowd.eu/server-video

ETRA is a large business group dedicated to putting at the service of society the most advanced technologies in three main activity lines: cyber-physical security, smart energy management systems, and smart mobility. In most cases it is ETRA's staff who runs the infrastructure deployed or provides guidance for our customers – the public authorities and agencies and Intelligent Infrastructure Operators.
http://www.grupoetra.com/en

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LETSCROWD Publications

Read our publications at
https://letscrowd.eu/peer-reviewed-scientific-papers

- R. Delussu, L. Putzu, G. Fumera, "**An Empirical Evaluation of Crowd Counting and Density Estimation Methods in Cross-scene Scenarios**",
  submitted to VISAPP 2020, 15th International Conference on Computer Vision Theory and Applications, Valletta, Malta, February 27-29, 2020
  Paper submitted – PDF will be available in the LETSCROWD website after the publication

- R. Delussu, L. Putzu, G. Fumera, "**Investigating Synthetic Data Sets for Crowd Density Estimation**",
  submitted to VISAPP 2020, 15th International Conference on Computer Vision Theory and Applications, Valletta, Malta, February 27-29, 2020
  Paper submitted – PDF will be available in the LETSCROWD website after the publication

- A. Cuesta, O. Abreu, A. Balboa, D. Alvear, "**A new approach to protect soft-targets from terrorist attacks**",
  in press, in Safety Science, Volume 120, Pages 877-885, Elsevier, December 2019
  Paper in press – PDF will be available in the LETSCROWD website after the publication

- O. Abreu, A. Cuesta, A. Balboa, D. Alvear, "**On the use of stochastic simulations to explore the impact of human parameters on mass public shooting attacks**",
  in press, in Safety Science, Volume 120, Pages 941-949, Elsevier, December 2019
  Paper in press – PDF will be available in the LETSCROWD website after the publication

- Cuesta, J.A. Alonso Velasco, O. Abreu, D. Alvear, "**RTE: herramienta predictiva para la gestión de la evacuación de eventos multitudinarios**",
  accepted at DESEi+d 2019 VII Congreso Nacional de I+D en Defensa y Seguridad, San Fernando, Spain, 19-21 November 2019
  Paper accepted – PDF will be available in the LETSCROWD website after the publication

- J. González, J.A. Alonso, O. Abreu, D. Alvear, "**Pre-event security decision support system**",
  accepted at DESEi+d 2019 VII Congreso Nacional de I+D en Defensa y Seguridad, San Fernando, Spain, 19-21 November 2019
  Paper accepted – PDF will be available in the LETSCROWD website after the publication

- C. Dambra, C. Graf, J. Arias, A. Gralewski, "**A Dynamic Risk Assessment (DRA) Methodology for High Impact Low Probability (HILP) Security Risks**", CRITIS 2019: 14th International Conference on Critical Information Infrastructures, Linköping, Sweden, 23-25 September 2019

- C. Dambra, A. Gralewski, J. Arias, "**LETSCROWD: Dynamic Risk Assessment for Mass Gatherings**", ISCRAM 2019, Int.l Conf. on Information Systems for Crisis Response and Management, Valencia, 19-22 May 2019

- S. Cáceres, A. Marqués, J.Alonso, C. Pérez, "**Ciuudades inteligentes más seguras, nuevas herramientas para la gestión de eventos masificados para la Policía Municipal de Madrid y la Ertzaintza**", Libro de comunicaciones y proyectos, IV Congreso de Ciudades Inteligentes, Madrid, May 30-31, 2018 (pp 406-424)

- B. Lavi, G. Fumera, F. Roli, "**A Multi-Stage Ranking Approach for Fast Person Re-Identification**", IET Computer Vision, Volume 12, Pages 513-519, IET, June 2018

- R. Soleymani, E. Granger, G. Fumera, "**Progressive Boosting for Class Imbalance and Its Application to Face Re-Identification**", Expert Systems With Applications, Volume 101, Pages 271-291, Elsevier, July 2018

- G. Ortiz, D. Alvear, S. Cáceres, "**Metodología y herramientas centradas en el factor humano para una mayor seguridad y protección ciudadana en eventos masificados** (Law Enforcement agencies human factor methods and Toolkit for the Security and protection of CROWDs in mass gatherings)", Conference proceedings, V Congreso Nacional de I+D en Defensa y Seguridad, Toledo, Spain, November 2017

- Cuesta, K. Rodríguez, O. Abreu, D. Alvea, "**Taking into account groups for evacuation analysis**", Conference proceedings, International Conference on Research and Advanced Technology in Fire Safety, Santander, Spain, October 2017