TeamAware

TEAM AWARENESS ENHANCED WITH ARTIFICIAL INTELLIGENCE AND AUGMENTED REALITY

Deliverable D14.10

Dissemination and Communication Report v2

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Abstract:	In this report, the achievements in the dissemination and communication activities for the second year of the project (05/2022 until 04/2023) are presented
Keyword List:	Dissemination, Communication
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Document Description

Document Revision History

Version	Date	Modifications Introduced	
		Modification Reason	Modified by
v0.1	31/03/2023	First draft version	SRDC
v0.2	20/04/2023	Comments and suggestions received by consortium partners	SRDC
V1.0	25/05/2023	Final version to be released to the EC	SIMAVI

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Terms and Abbreviations

ADS	Acoustic Detection System
AMS	Activity Monitoring System
ARMI	Augmented Reality and Mobile Interfaces
CDS	Chemical Detection System
CICIS	Citizen Involvement and City Integration System
COILS	Continuous Outdoor-Indoor Localisation System
EC	European Commission
IMS	Infrastructure Monitoring System
SSCN	Secure and Standardised Communication Network
TMS	Team Monitoring System
TP	TeamAware Platform
VSAS	Visual Scene Analysis System
WCDS	Wearable Chemical Detection System
WP	Work Package

Executive Summary

The main objective of the TeamAware Project is to develop an integrated and cost-efficient situational awareness system for first responders from different sectors.

This is the Deliverable 14.10 Dissemination and Communication Report, developed within the Work Package 14. This strategy aims to plan, organise, and evaluate key communication and dissemination activities undertaken by the Consortium for the promotion of TeamAware's results and findings, including the diffusion of innovations generated, to targeted audiences. The current document is a working document and will be updated throughout the project's duration. The communication and dissemination objectives are to:

- Raise awareness of the project objectives, results, and scheduled events to build reputation, create engagement/adherence and support/endorsement
- Widely disseminate the project's concepts, findings, and results throughout the project's life, while constantly revising and evaluating the effectiveness of selected mediums
- Ensure the long-term impact of the project by establishing appropriate lines of communication to maximise influence on policy and decision makers within targeted communities (first responders, research, academia)
- Promote collaboration with similar EU and national level projects
- Inform stakeholders about the relevance of the project's outcomes

Promote the findings and the results of the project to the targeted audiences in a regular and consistent mannerIn the context of the TeamAware Project, this will be achieved through:

Target audiences - the stakeholders in emergency management including (1) End-user community that represent "potential customers" such as firefighters, first responder organisations, LEAs, MDs, practitioner organisations, and experts, (2) Policy and decision makers that represent "influencers, deciders and regulators" in the area of emergency operations and first responder, (3) Business community: technology developer industry organisations, SMEs, industrial associations, umbrella organisations, national/European level industry platforms, consultants, solution providers, system integrators, (4) Research community: universities, research centres/institutes, academicians, researchers and (5) General public: NGOs, civil society and citizens

Key messages - related to the project's innovative solutions in delivering situational awareness to first responders, its impact and contributions, as well as its collaborative approach.

Key tools - those mediums & channels, which will be utilised per audience in order to facilitate awareness, understanding and action, from the perspective of the different targeted audiences.

Evaluation and monitoring procedures - which will allow for the entire communication and dissemination plan and respective activities to be monitored and assessed on a regular basis during the project life. Minimum success thresholds will be used for each communication tool.

The overall communication and dissemination strategy has been divided into distinct phases, in accordance with the phases of the project, focusing on:

1) Awareness-raising - aiming to motivate targeted audiences to become interested in being informed about the progress of the findings and to actively engage in dialogue about the project goals.

2) Communicating with targeted audiences on available project results, aiming to promote a deeper understanding as well as to further motivate their involvement.

3) Dissemination of results that will ensure long-term impact and utilisation of the project results.

The aim of this deliverable is to present the current status and figures in terms of the targeted KPIs as described in D14.1 Dissemination and Communication Plan.

1 Introduction

The Deliverable 14.1, 14.4 and 14.9, entitled Dissemination and Communication Plan, aims to define the strategy to appropriately plan and organise all communication and dissemination activities undertaken by the Consortium for the promotion and diffusion of TeamAware's results and findings to target audiences (first responders, decision makers/funders/regulators/policy representatives, ICT developers of digital tools/developers of emergency management systems and academics in this field).

1.1 About this deliverable

The following EU H2020 definitions have been used to inform the TeamAware communication and dissemination strategy as follows[1]:

- Communication: 'Strategic and targeted measures for promoting the action itself and its results to a multitude of audiences, including the media and the public' with the aim of promoting your project and its results beyond the projects own community, reach out to society.

- Dissemination: 'The public disclosure of the results by any appropriate means, including by scientific publications in any medium. Transfer of knowledge and results to the ones that can best make use of it' which in turn 'maximizes the impact of research, enabling the value of results to be potentially wider than the 'original focus'. This includes open access to publications and data which are all considered to be an 'essential element of all good research practice' and 'prevents results becoming sticky and effectively' and 'strengthens and promotes the profile of the organisation'.

The present deliverable gives a status update on the dissemination activities (as planned in D14.1, D14.4 and D14.9) in the first year of the project duration.

1.2 Document structure

The organisation of the deliverable is as follows:

- Section 2 describes the status and figures of the dissemination KPIs of our project.
- Section 3 gives information about a new initiative called HorizonResultBooster.eu to support our dissemination activities.
- Section 4 presents the publications (Papers, Posters and Magazines) published by TeamAware partners.
- Section 5 presents the press/media activities of the TeamAware project.
- Section 6 reports on the conference participation by TeamAware partners.
- Section 7 presents the initial Ankara demonstration workshop.
- Section 8 presents the social media activities.
- Section 9 gives information about the online lectures developed in the TeamAware project.
- Section 10 reports about the web site activities (published Blogs and Newsletters)
- Section 11 concludes the deliverable.

[1] http://ec.europa.eu/research/participants/portal/desktop /en/support/reference_terms.html

1.3 Relation with other tasks and deliverables

This deliverable is related with all WPs since it presents the overall dissemination and communication activities of the TeamAware Project.

2 KPI Status

The status of the dissemination and communication KPI's can be seen in Table 1.

Table 1 KPI Status Table

Communication tools	Target group	Success measures / KPIs	Status
Peer-to-peer interaction	Consortium team	7 pre-defined consortium meetings	1 in November 2022 in Ankara.
Internal meetings	Consortium team	>36 regular online meetings/tele-conferences	Due to COVID all work is carried out through weekly/biweekly/monthly meetings. The KPI target has already been achieved as reported in the first version of this deliverable.
Internal reporting	Consortium team	6 semi-annual progress reports	4 progress reports.
-	Consortium team	A reserved area for internal document exchange (repository with versioning control)	Alfresco repository is installed.
TeamAware Website	All	> 2 blog posts per month > 3 newsletters published on the website > 250 members for the mailing list	• 23 blog post published (~ 2 blog posts per month from partners) • 7 newsletters published • In the mailing list, there are currently 93 members.
Forum at TeamAware Website	All	> 100 forum members	It is 32 as of writing this deliverable. In the last year it will increase with the newly established RTC Cluster
Promotional tools and materials	All	> 1000 visits for the project video > 3 leaflets translated to partner languages 1 project roll-up for each partner	• According to Individual Dissemination Plan Sheet, the first video will be published in July 2023. • It is 9 leaflets now • Roll-up not prepared yet.
Social media	All	> 300 Twitter followers > 250 members on the LinkedIn page > 3 posts released per month > 2 debates started per month	• It is 120 as of writing this report. • It is 199 now as of writing this report. • It is 3 posts per-month. • Not started yet.
Press and other media	All	> 5 press releases or articles published > 5 news on TV	• 8 Magazine articles published. • 1 Press release from StandICT • 3 (1 news on YouTube Channel, 2 local media)
Scientific publications	Priority 4 & 3	> 10 publications/papers released to journals/conferences	5 publications.
3rd party events	All	> 10 international events (conferences, fairs etc.) participated for representing TeamAware	14 conference participations realised.

Face-to-face interaction: visits	Priority 1 & 2	> 10 visits to end-users outside the consortium > 5 visits to policy/decision makers	• (One visit to Czech Firefighters, One Turkish Rescue Team in Earthquake area) • Planned for the third year.
TeamAware events*	All	1 international workshop 3 networking events organised by TeamAware > 50 attendees for each event	• 1 International Workshop in Ankara November 2022. • 1 networking event: TeamAware was one of the organizers CERIS DRS event scheduled on 7-10 November at the BAO Congress Centre (Brussels) • RTC Cluster will be formed in the last year. • Planned for the last year.
Advisory Board membership	Priority 1, 2, 3 & 4	> 15 Advisory Board members 3 Advisory Board meeting organised	• 1 Advisory Board Meeting
Stakeholder's acceptance survey**	All	> 10 filled survey per each group	Planned for the last year
Online Lectures	Priority 3, 4 & 5	• One online lecture regarding the final expected outcome of TeamAware • One online lecture focusing on the general introduction of AR/VR • One online lecture focusing on the user experience of the final TeamAware output	• Online Lecture realised. • Scheduled for the last year • Scheduled for the last year

3 Horizon Result Booster Initiative and RTC Cluster

In order to support the dissemination activities, the consortium has decided to benefit from the free-of-charge services offered by the HorizonResultBooster.eu initiative. The Horizon Results Booster is a new initiative backed by the European Commission which aims to maximise the impact of research projects funded by FP7, Horizon 2020 and HE. It helps to bring a continual stream of innovation to the market and beyond. It will help to speed up the journey towards creating an impact, providing support to remove bottlenecks.

The consortium will benefit from "à la carte" tailor-made services designed to build the capacity for disseminating research results. A support to increase the project results' exploitation potential and improve the access to markets is also possible to get. The services are delivered to FP7, H2020, HE projects at no cost and fully supported by the European Commission.

Especially Portfolio Dissemination and Exploitation Strategy Service will be used. This service is divided in two main streams addressing Dissemination & Exploitation strategies, activities and goals. The aim of Dissemination services (Module A and B) is to strengthen the capacity of Project Groups (PGs) in disseminating, maximising the dissemination of a portfolio of results and offering a wider and more complete view to potential users.

TeamAware's application to the HorizonResultBooster service was confirmed in January 2023 and the first meeting took place on January 24, 2023. The TeamAware project consortium created accounts in the HRB Workspace.

As the first step different sister projects have been contacted to create a project cluster. Actually, TeamAware joined the Disaster Resilience Societies Cluster Conference by CERIS on November 7-10 2022 in Brussels and initiated a project cluster with the following projects NIGHTINGALE, INGENIOUS, RESCUER, MED1stMR, PathoCERT, INTREPID, Search & Rescue and RESPOND-A. TeamAware has contacted these projects again and they confirmed their participation. This cluster is named Responder Technology Cluster (RTC) and current members are as follows:

Figure 1. RTC logo

Table 2 RTC Members

Project	Start - Finish	Name - Surname	Role	Organisation
NIGHTINGALE	10/1/2021 9/30/2024	Eleftherios Ouzounoglou	Coordinator	EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLGISTON-EMP

RESCUER	7/1/2021 6/30/2024	Jorge Alfonso		UNIVERSIDAD POLITECNICA DE MADRID
MED1stMR	6/1/2021 5/31/2024	Helmut Schrom-Feiertag		AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH
TeamAware	5/1/2021 4/30/2024	Caglar Akman	Coordinator	HAVELSAN
		Yildiray Kabak		SRDC Corp
PathoCERT	9/1/2020 2/29/2024	Eliades Demetrios		UNIVERSITY OF CYPRUS
INTREPID	10/1/2020 9/30/2023	Alexandre Ahmad		CS GROUP-FRANCE
Search and Rescue	7/1/2020 6/30/2023	Anthony Lamaudiere		ETHNICON METSOVION POLYTECHNION
RESPOND-A	6/1/2020 5/31/2023	Anthony Lamaudiere		EUROPEAN UNIVERSITY - CYPRUS LTD
INGENIOUS	9/1/2019 2/28/2023	Eleftherios Ouzounoglou	Coordinator	EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLGISTON-EMP
CURSOR	9/1/2019 2/28/2023	Tiina Ristmaee	Coordinator	BUNDESMINISTERIUM DES INNERN
"ASSISTANCE "	5/1/2019 7/31/2022	Juan Pablo Escobar	Coordinator	UNIVERSITAT POLITECNICA DE VALENCIA
FASTER	5/1/2019 4/30/2022	Anastasios Dimou	Coordinator	
RESPONDRONE	5/1/2019 4/30/2022	Max Friedrich	Coordinator	DEUTSCHES ZENTRUM FÜR LUFT - UND RAUMFAHRT EV

The proposal to establish the RTC cluster is as follows:

The Crisis Management Innovation Network Europe

Proposal to establish a Responder Technology Cluster (RTC) of DRS02-related Projects

What is a DRS Cluster?

A Cluster is an informal, voluntary and free subset of the CERIS DRS community made-up of those projects working on related research areas under the Disaster Resilient Societies (DRS) framework.

Its purpose is to promote good practice in research through collaboration and to recognise opportunities for efficiency wherever appropriate through combined activity such as dissemination events.

Membership is for all current projects (H2020 and Horizon Europe) funded by Grant Agreement and will typically involve around 6 current projects, maintain the legacy of recently concluded projects and also to welcome those newly successful as they establish their own Grant Agreements.

A Responder Technology Cluster (RTC)

Those being contacted about establishing the RTC include (but may not be limited to):

- NIGHTINGALE (& INGENIOUS) – Next Generation Integrated Toolkit for Collaborative Response, increasing protection and augmenting operational capacity
- RESCUER - First-Responder-centred technology toolkits empowering and enhancing the operational capacity of First Responders
- MED1stMR - mixed reality training technology to combine real-world medical simulators with virtual environments
- TeamAware - Assessing new technologies in operations
- PathoCERT - Helping first responders to address waterborne pathogen contamination
- INTREPID - Setting up a methodology for field validation of innovative technologies
- Search & Rescue - Emerging technologies for the Early location of Entrapped victims under Collapsed Structures and Advanced Wearables for risk assessment and First Responders Safety in SAR operations
- RESPOND-A - Providing new interaction between First Responders and research centres

Why now?

TeamAware has been running for 18 months now. As part of its 12 month review, it recognised the limited contact it had had with other projects involved in the same area of research and innovation.

One of its partners RAN, already provide the resources of CMINE to facilitate a Cluster of Societal Resilience projects under DRS01.

Following discussion, they would wish to adopt this process to engage with broader Responder Technology projects and have asked CMINE to explore the appetite for such an initiative.

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01 March 2023

Potential for Shared Benefit

- Shared access to Horizon Results Booster services (collaborating to spread the load)
- A clear environment in which to communicate and innovate with other co-ordinators
- A current list of active projects and individuals researching similar themes to yourself
- A structure of Terms of Reference under which the Cluster will operate
- A facilitator / secretariat provided to encourage maintenance of the Cluster, to recognise shared opportunities and to maintain communications
- A specific Cluster space on the CMINE platform to encourage sharing and to enable your projects communication with more than 1,500 crisis management experts
- Regular meetings for coordinators and for Dissemination leads
- Joined-up events such as CERIS and other relevant opportunities
- Access to the shared DRS glossary or terms developed by partner projects
- Highly relevant networking opportunities and events

Steps required to establish the Cluster…

An introductory email has been sent to Co-ordinators asking if they'd like their project to become part of the Cluster. An initial membership list will be created from positive responses.

A first meeting will be called at which Scope and ToR's will be further discussed. A dedicated space will be created on CMINE with access for all members.

A common 'launch' report will be created for all projects to use in their dissemination, impact and exploitation activities.

If you haven't already registered for a CMINE account, please do so here as this will be our main communication medium.

If you'd like to see the CERIS introduction to creation of this Cluster presented in November, you can watch it here

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Tel: +353 1906 9575
CMINE is funded by the European Commission through its Horizon programmes and was established as part of the sustainability strategy for Driver+ ID: 607798. It is further supported by grants from current projects including: TeamAware ID: 101019808, PEERS ID: 101074040 and PARATUS ID: 101073954. The community is currently facilitated and maintained by the Resilience Advisors Network under a formal Memorandum of Understanding with the European Research Executive Agency.
Resilience Advisors (Europe) Limited, Republic of Ireland, Reg No. 614202, 22 Northumberland Road, Ballsbridge, Dublin 4 D04 ED73

The Terms of Reference for the RTC Cluster is as follows:

DRS Responder Technology Cluster Network Support

Terms of Reference

Introduction & background

The European research and innovation supporting programmes Horizon 2020 and Horizon Europe connect diverse actors, engaged to strengthen the impact of research and innovation in developing, supporting and implementing EU policies, while tackling specific global challenges. Their active communication and collaboration through platforms such as the Community for European Research and Innovation for Security CERIS and clusters leads to deeper exploration of challenges and broader uptake of generated solutions, strengthened synergies and magnified benefits of research in strategic societal challenges. The Crisis Managers Innovation Network Europe CMINE is offering a dynamic, safe workspace to the established Clusters of projects, supporting their interaction-focused objectives throughout the project implementation cycles.

Expressing appreciation for all the results achieved by individual DRS02 Cluster projects, while seeing both the need and added value in expanding their cooperation with sister projects supported under the Horizon 2020 programme's DRS02 priorities, the CMINE enables the Cluster projects to benefit from enhanced cooperation so they can:

1. Jointly participate in activities, initiatives and develop shared outputs, providing support to their further dissemination and uptake.
2. Enjoy facilitated interaction between Cluster project teams, maintaining space for dialogue and cooperation across the project implementation cycle in a safe, supportive working space flexibly adjusted to their needs.
3. Benefit from a contact point for institutions and initiatives wishing to provide space for the promotion of the Responder Technology Cluster objectives and outcomes.
4. Create interactive space to share project implementation related challenges, lessons learned and improved knowledge transfer between the project teams, other institutional partners, including research organisations and solution providers.
5. Facilitate exchange of information and experiences and promote collaboration in the relevant domains within the Responder Technology Cluster and beyond, in line with the respective Horizon 2020 programmes' and individual member project's strategic objectives.

Brief history and mission of the CMINE to Cluster support

The Responder Technology Cluster (RTC) was established to enable closer cooperation between the Horizon 2020 projects NIGHTINGALE (& INGENIOUS), RESCUER , MED1stMR, TeamAware, PathoCERT, INTREPID, Search & Rescue, RESPOND-A. The Cluster is hosted on the CMINE platform and is endorsed by the European Research Executive Agency REA. CMINE was launched in 2019 to enable the project teams to interact with other resilience focused, Horizon 2020 supported projects engaging in an open dialogue about joint cooperation, creating a baseline for closer interaction,

building up on synergies and generating added value collaboration, based on the conviction that community platforms simplify communication exchange, mandate cooperation and also calibrate joint efforts in the research arena.

The closer cooperation provides a window to co-create, participate in and observe discussions on innovation and thereby establish an unprecedented sharing of knowledge across resilience related fields and diverse audiences. With the support of the CMINE platform, the involved projects' teams are linked to provide access to activities and initiatives while providing a platform for focused discourse and cooperation on specific deliverables, reducing repetition and fragmentation. The Cluster-based interaction is designed to encourage active sharing of new ideas across the project implementation cycle and enable the teams to jointly identify innovative solutions to improve European resilience.

Overview of Activities

In order to achieve the above-mentioned aims, the Cluster will, with the support of CMINE, systematically organise and benefit from diverse activities serving these purposes. Such activities may include, but are not limited to:

1. Exchanging of experiences and lessons learned
   - Organising workshops, seminars, participation in conferences and other events
   - Enabling member project teams to participate in trials, simulations, crisis management exercises and other events realised within the cluster
   - Give presentations at conferences, prepare input for publications
   - Conduct joint activities when appropriate

2. Communication and networking
   - Use of CMINE as the platform to communicate within the Cluster
   - Promote Cluster projects' outcomes among the systematically built audiences whenever appropriate
   - Support activities aimed at dissemination of project results
   - Communicate about the Cluster
   - Establish and maintain links with other relevant Clusters, networks and partner organisations

The Cluster members will benefit from a dedicated workspace on CMINE, which acts as a platform for communication, exchange of information, sharing of documents and joint organising of events. Regular (virtual) meetings of the Cluster Coordination Team and as required the entire Cluster (with participation of all project teams) are organised to discuss experiences and lessons learned, engage in the preparation of events and identify opportunities to collaborate. In addition to the virtual meetings, at least one or two times a year, a joint workshop is organised to facilitate a more in-depth sharing of experiences in a specific area of focus relevant to all involved project teams. The Cluster also creates space for other project teams to attend and observe selected activities, trials, tests, training or exercises, in order to learn from each other and to get a better understanding of project actions and outcome delivery processes. The shared experiences are well documented and accessible, and can be used for, e.g. defining recommendations regarding use and/or further development of deliverables and organisation of events.

The kick-off meeting was held on the 6th of April, 2023. The agenda was as follows:

The Crisis Management Innovation Network Europe

Kick-Off Meeting

Agenda

06 April 2023

1 Welcome and tour de table (name, project & role)

2 Responder Technology Cluster (Jon)
- An introduction and a little history
- Membership & Structure
  1 Coordinating Team
  2 Broader Cluster
  3 Role of Chair & Facilitator
- CMINE Group for the Cluster
- Terms of Reference

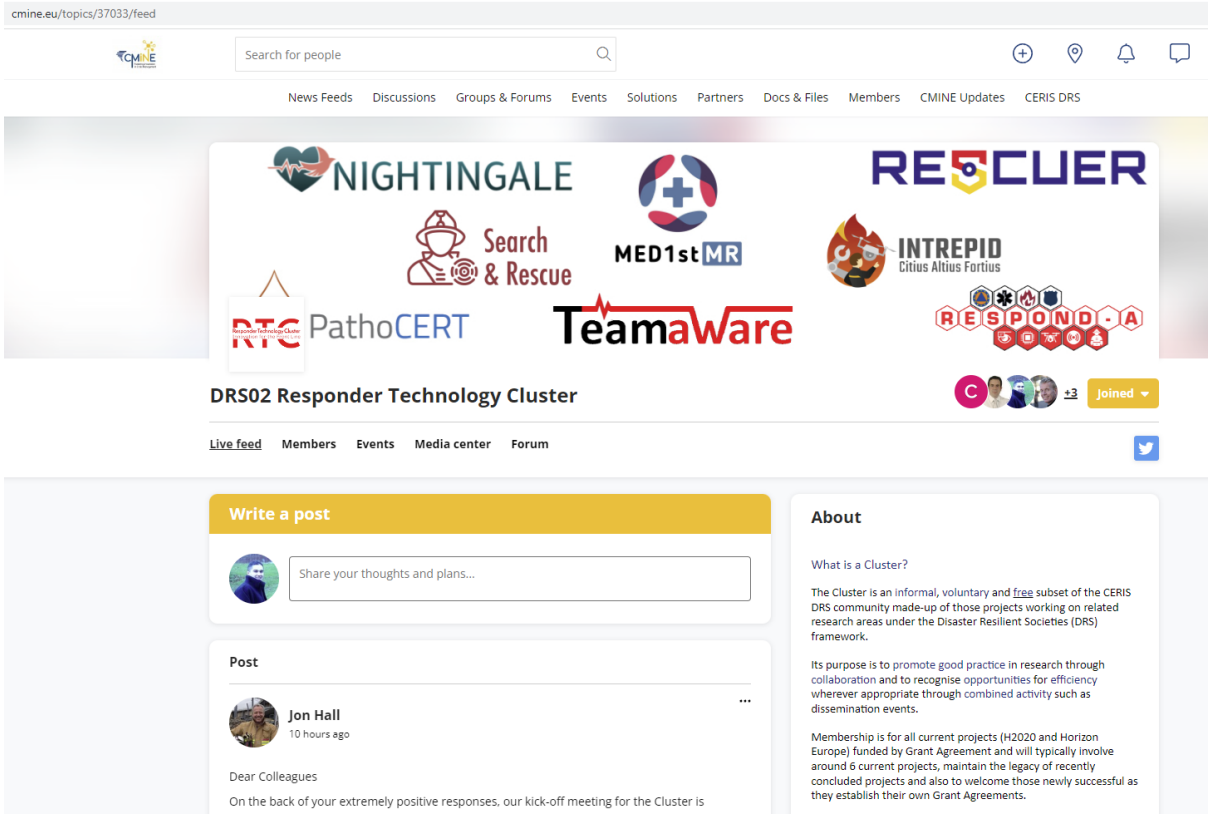
3 Events planned for 2023 (All)
- CERIS calendar (Main Event in Nov/Dec)
- Potential RTC events
- Sharing of upcoming Project events

4 Project-Boosting Initiatives:
- Glossary Update (Jon)
- Using CMINE to boost Project and RTC impact (Jon)
- Horizon Results Booster (Rob)

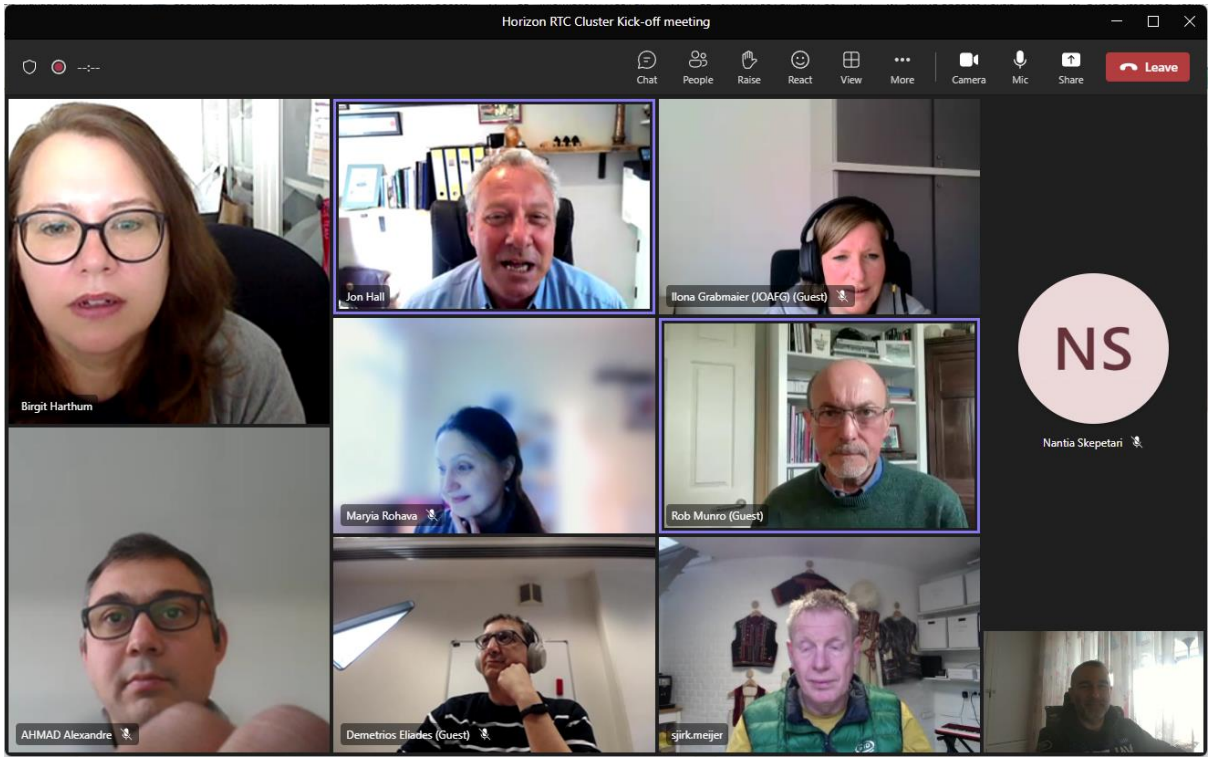
5 AOB

6 Date of next meeting

The web area of the cluster at CMINE web site:



The participants of the kick-off meeting are shown below:



The minutes of the meeting are as follows:

Horizon DRS Responder Technology Cluster

Coordination Team Meeting Minutes

06 April 2023

Attendees

INGENIOUS - Nantia Skepetari
INTREPID - Alexandre Ahmad
MED1stMR - Birgit Harthum
NIGHTINGALE - Maryia Rohava
PathoCERT - Demetrios Eliades
TeamAware - Yildiray Kabak, Ilona Grabmaier
CMINE - Jon Hall, Sjirk Meijer, Rob Munro

Introduction

- Jon Hall (JH) confirmed that everyone has received the Cluster Proposal, explaining what a cluster is and its objectives; in addition to the RTC, JH also raised the other two DRS clusters – Societal Resilience Cluster (SRC) and CBRN and Standardisation Cluster (CSTAC)
- JH confirmed it is entirely voluntary to attend these meetings and there are no costs related to joining the cluster

- Support from DG HOME and project officers from REA for these cluster initiatives
- JH explained that CMINE is the online platform used to support cluster activities and the primary platform for inter-project communications. Originally created within the DRIVER+ project, CMINE is now funded through a number of projects and is included in proposals
- Nantia Skepetar (NS) will send NIGHTINGALE logo for inclusion on CMINE group home page

Structure of RTC

- Rob Munro (RM) to email all contacts asking for dissemination names if not already known
- RM to upload the Terms of Reference in Word format on CMINE so they can be included in project deliverables, if required
- RM to send an invitation to join CMINE to partners not yet registered
  - For those not already on CMINE, the link to register is here https://www.cmine.eu/login
  - Once logged-in, the link to join the Cluster is here https://www.cmine.eu/topics/37033
- Jon demonstrated the key functionality of CMINE – announcements, list of members, events, discussion forum, documents to download
  - Partners can ask CMINE admin to upload any documents they wish to share with the cluster
- Demetrios Eliades (DE) asked whether DG ECHO projects could be involved in the cluster as well. JH replied there have been some challenges as DG ECHO cannot engage with a privately owned platform and the Knowledge Network excludes commercial entities. Discussions are ongoing with Felix Bloch to investigate if this can be overcome
- JH and DE to continue discussion separately and see if they can take it further with Felix Bloch to progress this with DG ECHO

Events planned for 2023

- CERIS – if you are involved in a CERIS event, have a think about whether to invite some others from the Cluster to maximise impact
- CERIS main event in Nov/Dec – hopefully there will be a RTC day, but this is to be confirmed with DG HOME
- The Search & Rescue final conference and standardisation workshop is on 08-09 May near Athens
- Birgit Harthum (BH) confirmed three webinars coming up; first on 25/4 and others planned for May; field trials and a final conference planned but dates not yet confirmed – BH will provide further information and visuals for posting on CMINE
- BH might bring in another project she used to work on – VR solution for police; JH confirmed this is fine and CMINE will validate new applicants with project that hs proposed them
- Maryia Rohava (MR) – some NIGHTINGALE events coming up, including a round table and small scale exercise in September; very interested in disseminating these through the cluster

Project Boosting Initiatives

Horizon Results Booster

- Four of the nine cluster projects are already involved in the Horizon Results Booster (HRB) at different levels of advancement – TeamAware (Yildiray) has completed module A and the exploitation part, is now working on the dissemination part

- RM to contact RTC contacts and then liaise with Sofia Finzi at ICONS and create a spreadsheet showing the state of advancement for all projects and then identify how best to coordinate activities
- RM to set up a meeting with Sofia to discuss what ICONS can do for cluster in HRB
- BH asked whether it would be valuable to go through HRB process again with MED1stMR and RTC, already completed it with two other projects.
- INGENIOUS (Nantia Skepetari) has also completed module A and is now working on module B

Glossary of Terms

- CMINE also contains a Glossary of Terms, containing disaster management terms generated by eight projects plus approximately 1,000 terms from UNISDR, all relevant to the work we do
- Notify CMINE admin if the Glossary does not contain a term or phrase that you use in your project; include a link to the Glossary in future deliverables to save writing out a full glossary in each deliverable

AOB

- CMINE (JH/Sjirk Meijer) to consider integrating all contacts in the RESCUER group into the RTC

Actions

1. Nantia Skepetari (NS) to send NIGHTINGALE logo for inclusion on CMINE cluster home page
2. Rob Munro (RM) to email RTC cordinators asking for dissemination names if not already known
3. RM to upload the Terms of Reference in Word format on CMINE so they are available to be included in project deliverables
4. RM to send an invitation to join CMINE to any partners that have not yet registered
5. Partners can ask CMINE admin to upload any documents they wish to share with the rest of the cluster
6. JH and DE to discuss possibility of DG ECHO projects joining the cluster and to pursue this further with Felix Bloch
7. BH to provide further information and imagery about the MED1stMR webinars for posting on CMINE
8. MR to provide any details and imagery for upcoming NIGHTINGALE events
9. RM to contact partners to establish what stage of the Horizon results Booster all projects have reached and then liaise with Sofia Finzi at ICONS to identify how best to coordinate activities
10. All partners to update CMINE admin if they wish to have a term or phrase in project included in the Glossary of Terms

4 Publications

4.1 Use of UAS for damage inspection and assessment of bridge infrastructures, M.Mandirola, C.Casarotti, S.Peloso, I.Lanese, E.Brunesi, I.Senaldi, International Journal of Disaster Risk Reduction, Volume 72, 1 April 2022

International Journal of Disaster Risk Reduction
Volume 72, 1 April 2022, 102824

Use of UAS for damage inspection and assessment of bridge infrastructures

M. Mandirola, C. Casarotti, S. Peloso, I. Lanese, E. Brunesi, I. Senaldi

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Highlights

- Inspections and monitoring of bridge infrastructures using drones.
- Use of drones to support disaster risk reduction strategies towards resilient bridge infrastructures.
- Definition of a practice-oriented approach for risk mitigation and resilience enhancement of bridge infrastructures.
- Pre-defined flight trajectories for inspection and 3D reconstruction purposes.

4.2 Mario Drobics, Denis Havlik, Massimo Merenda, Reliable and Rapidly Deployable Sensor Apps for First Responders, PSCE Conference in Salzburg (Public Safety Communication Europe), 11-12 May 2022

TeamaWare

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY TOMORROW TODAY

RELIABLE AND RAPIDLY DEPLOYABLE SENSOR APPLICATIONS FOR FIRST RESPONDERS

PSCE Conference - Salzburg, 11th May 2022

Mario Drobics, Denis Havlik, Massimo Merenda
AIT Austrian Institute of Technology

4.3 Martina Rasch, Antonio Martino, Mario Drobics, Massimo Mereda, "Short-Term Time Series Forecasting based on Edge Machine Learning Techniques for IoT devices", Splitech 2022 Conference, July 5-8, 2022, Croatia[2]

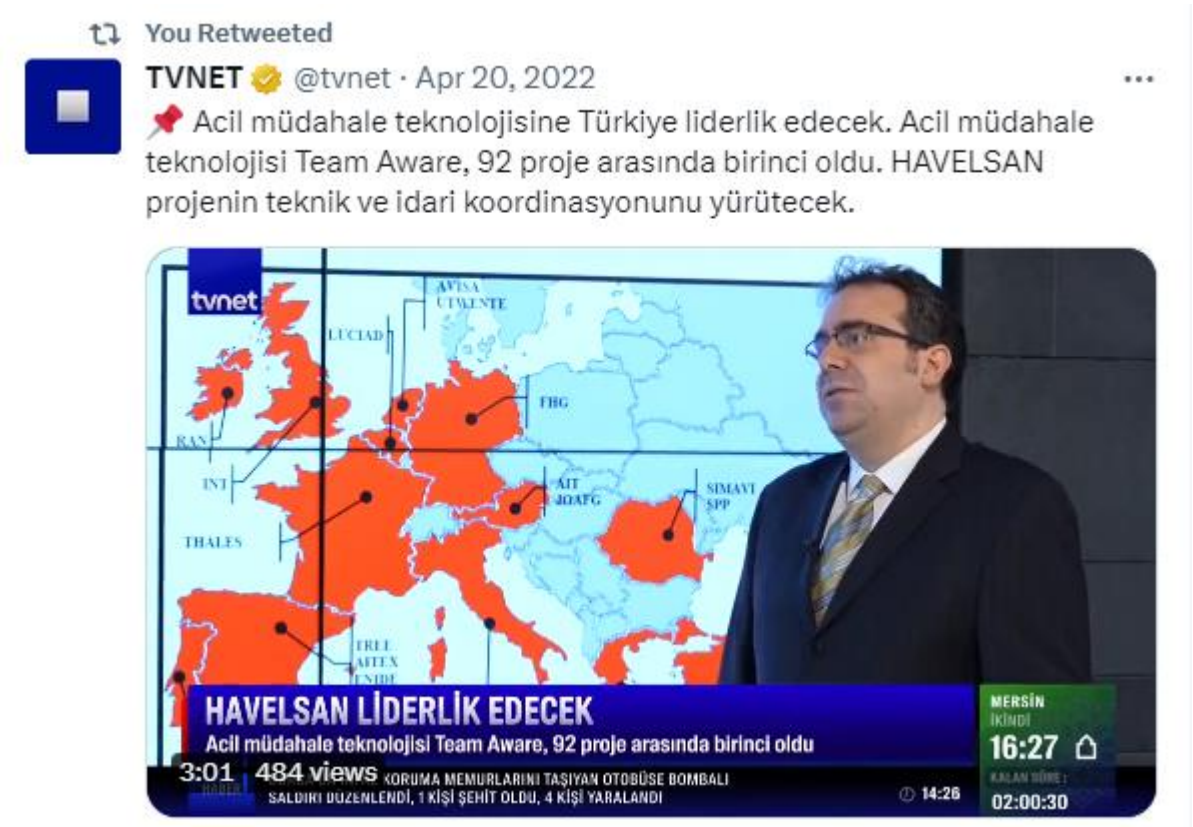
Short-Term Time Series Forecasting based on Edge Machine Learning Techniques for IoT devices

Martina Rasch (Austrian Institute of Technology, Austria); Antonio Martino (Politecnico di Torino, Italy); Mario Drobics (AIT Austrian Institute of Technology GmbH, Austria); Massimo Merenda (Austrian Institute of Technology, Austria)

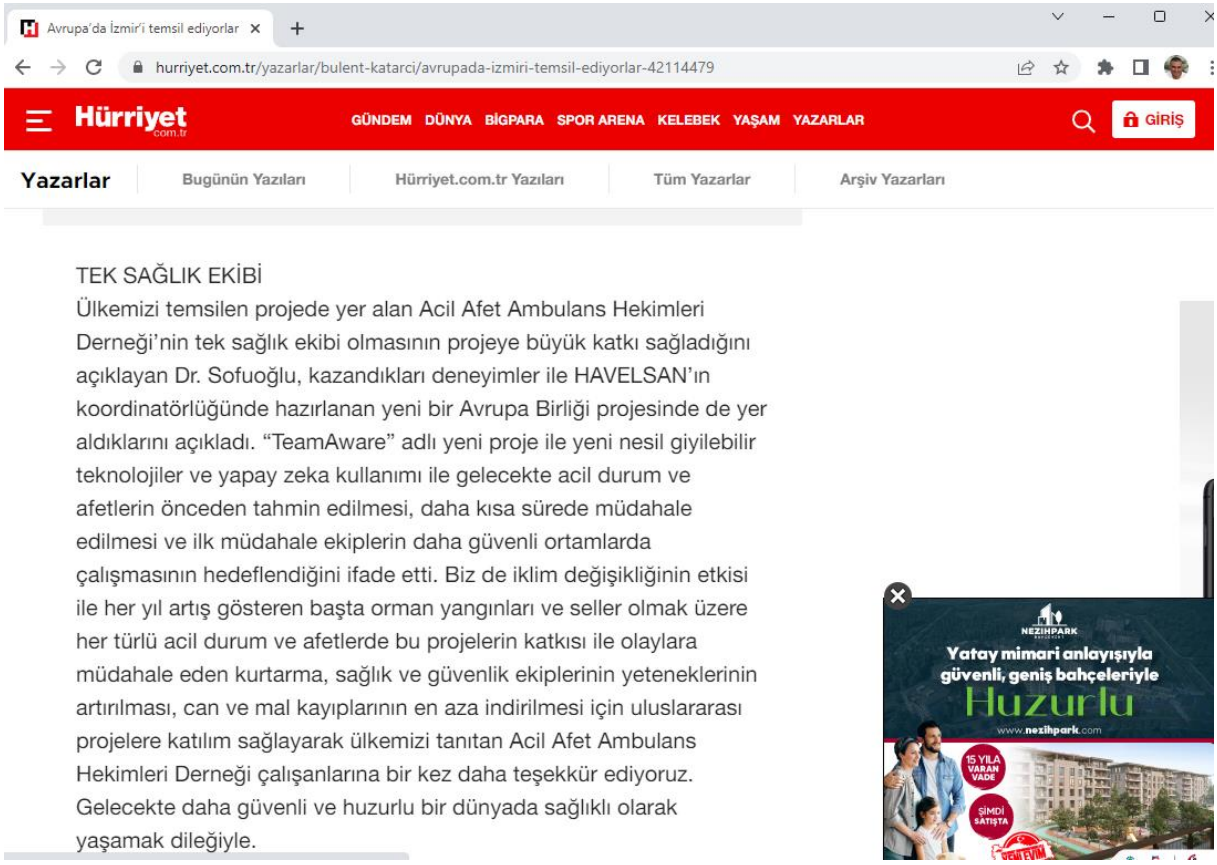
[2] https://2022.splitech.org/wp-content/uploads/2022/07/final_program.pdf

5 Press/Media

5.1 HAVELSAN published TeamAware project on local TVNET Media



5.2 TeamAware on national newspaper Hurriyet (highest circulation in Turkey)



5.3 Turhan Sofuoğlu from AAHD presented TeamAware project at regional radio Radyo Ege

On October 12, 2022 Turhan Sofuoğlu from AAHD presented the TeamAware project at the regional radio Radyo Ege and spoke about our achievements.

5.4 TeamAware project in local media Anadolu Agency[3]

[3] https://www.aa.com.tr/tr/ekonomi/turkiyenin-liderliginde-acil-durumlar-icin-avrupada-gucler-birlesti/2760457

Türkiye'nin liderliğinde acil durumlar için Avrupa'da güçler birleşti

Ankara

Avrupa'nın bilim ve teknoloji politika ve uygulamalarının uyumlaştırılması amacıyla Kıta'nın teknoloji kapasitesini geliştirmek, üniversite-sanayi işbirliğinin kurulmasını sağlamak için yürütülen Horizon 2020 fonlama programı kapsamında, Avrupa Birliği (AB) desteğiyle 13 ülkeden 24 paydaş kuruluşla "güvenli toplumlara" yönelik olarak TeamAware projesi hayata geçirildi.

Proje teklifi HAVELSAN tarafından hazırlanan TeamAware, 90 proje arasından 15 tam puan alarak Türkiye'ye Horizon 2020 Güvenlik kategorisinde ilk kez birinciliği getirdi.

Türkiye'nin yanı sıra Almanya, Fransa, İngiltere, Belçika, Hollanda, İspanya, İtalya, Avusturya, İrlanda, Portekiz, Romanya ve Yunanistan'dan çeşitli firmalar, araştırma enstitüleri ve üniversitelerin katkı verdiği proje, Mayıs 2021'de başladı ve Mayıs 2024'te tamamlanacak.

5.5 TeamAware is on national newspaper Hurriyet

In December 2022 , the project TeamAware was presented on the Turkish national newspaper Hurriyet, the newspaper with the highest circulation in Turkey.

16 Ocak 2023 Pazartesi

TeamAware

TÜRKİYE'NİN PROJESİ

Avrupa'ya örnek oldu

Sağlık Dünyası

Bülent KATARCI

bkatarci@hurriyet.com.tr

TÜRK savunma sanayinin öncü kuruluşu HAVELSAN'ın koordinatörlüğünde hazırlanan **"Team Aware"** projesi, geçtiğimiz yıl 15 tam puanla 92 proje arasından birinci olarak seçilip, Avrupa Birliği tarafından desteklenmeye layık görüldü. Türkiye'de 112 ambulans merkezlerinin kurulmasına öncülük eden, Acil Afet Ambulans Hekimleri Derneği (AAHD) Başkanı Dr. Turhan Sofuoğlu, Türkiye'nin hazırlağı projenin Avrupa'da acil durumlara müdahaleyi kolaylaştıracağını söyledi. Dr. Sofuoğlu, projeyi şöyle anlattı:

"Avrupa Birliği'nin araştırma, geliştirme ve inovasyon projelerine destek olan Horizon 2020 (Ufuk 2020) programı çerçevesinde hazırlanan proje ile acil müdahale ekiplerini (itfaiye, sağlık, polis) uzaktan takip eden, kapalı alanda yerlerini belirleyen, giyilebilir sensörler ve yapay zeka ile aktivitelerini tespit eden, giyilebilir kimyasal ve biyolojik sensörler, akustik sensörler, insansız hava araçları (drone) içeren bir sistem tasarlanıyor. Drone görüntülerinden yangın/duman tespit edilmesi, binanın yapısal olarak riskinin belirlenmesi de bu proje kapsamında yer alıyor. 5G iletişim altyapısı sağlanarak toplanan veriler, gerçek zamanlı durumsal farkındalık resminin oluşturulmasını ve tüm acil müdahale ekiplerinin uzaktan takip edilmesi ve yönetilmesini sağlayacak.

SORUMLULUK ÜSTLENİYOR

PARK

ÖĞRE

Şehit Ömer Yiğit Ulus M
Teknik Anadolu Lisesi ö
tarafından üretilecek met
ahşap banklar Bergama'
ve yeşil alanları süsle

İZMİR'in Bergama Belediyesi ve İlçe Milli Eğitim Müdürlüğü arasında yapılan protokol ile Şehit Ömer Yiğit Ulus Mesleki v Teknik Anadolu Lisesi öğrencileri park ve yeşil alanların ihtiyacı olan metal aksamlı, ahşap banklar üretecek. Belediye Park ve Bahçeler Müdürlüğü tarafından meslek lisesi işbirliğiyle sürdürülecek olan çalışma "Meslek Liseleri Üretiyor Projesi protokolünün imzalanmasıyla start aldı. Proje kapsamında ilk etapta 400 bank, 10 adet güneş enerjili, USB'li akıllı bank üretilecek. Protokol için düzenlenen törende Belediye Başkanı Hakan Koştu ve İlçe Milli Eğitim Müdürü Ekrem Ulus imza attı.

LÖSEV'

paylaş

LÖSEV kanser ile mücadele eden ailelerini 12 ay boyunca taze kırmızı et ve et ürünleri ile destekliyor. Mutlu Et Projesi kapsamında tüm yıl et yardımı yapılacak.

Özelikle sağlıklı beslenme zincirinin en önemli halkalarından biri olan protein, lösemi-kanser tedavilerinde hayati önem taşıyor. Araştırmalar kansere yönelik iyileşmeyi sağlayacak fonksiyon-

6 Conference Participations

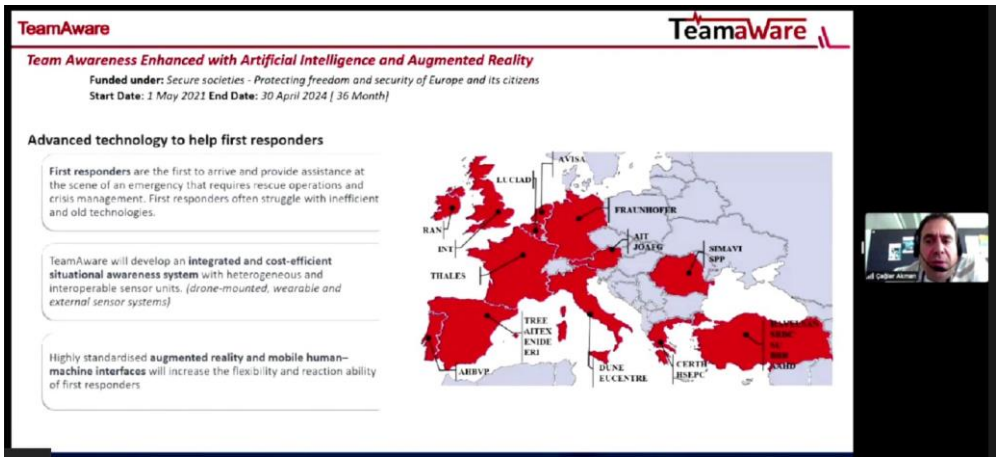
6.1 VRISE 2022 Workshop, Les Bons Villers, Belgium

As partner of the project, Enide presented TeamAware on the 7th of July as part of the TC17-VRISE 2022 workshop International IMEKO, TC17 special Session on Management of Risky Interventions and Environmental Surveillance, at the International CBRNE Institute in Belgium.

Enide shared with scientific and industry members the advances and contributions of the TeamAware project, which aims to provide first responders with advanced technology to enhance their safety and performance.

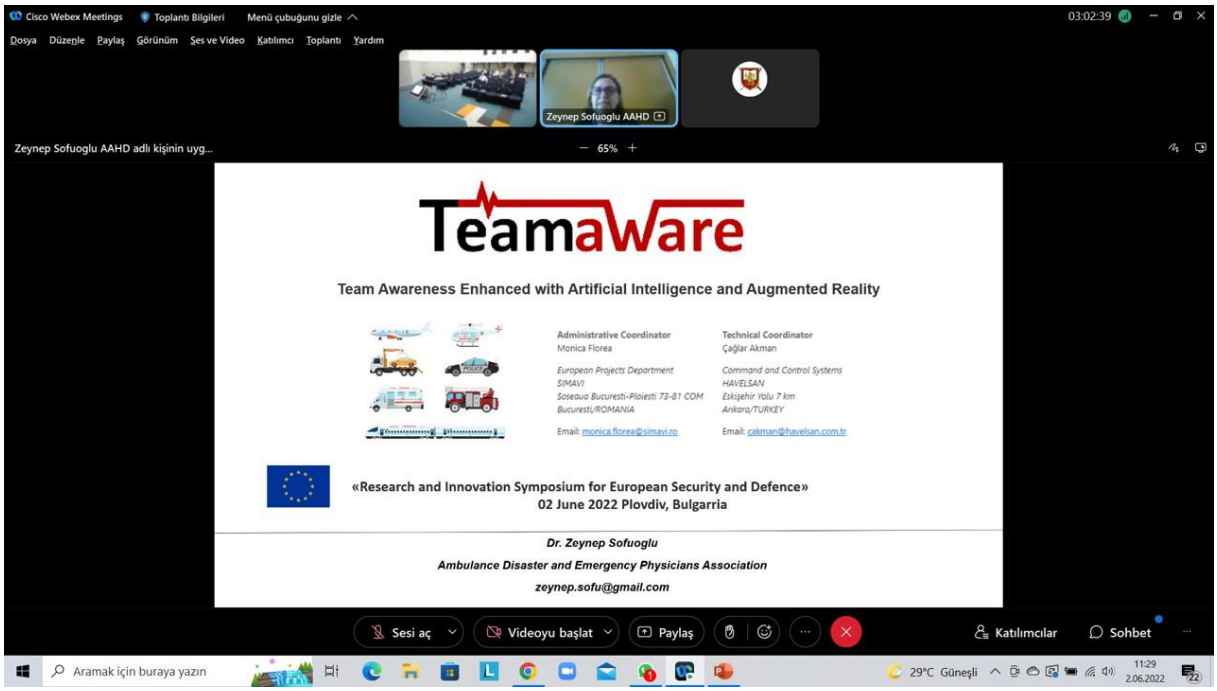
6.2 INGENIOUS 1st FSX and 1st International Workshop, "Tools for the First Responder of the future"

Caglar Akman presented the TeamAware project in the 1st International Workshop on "Tools for the First Responder of the future" on May 25, 2022.



6.3 Research and Innovation Symposium for European Security and Defence, International Fair, Plovdiv, Bulgaria

TeamAware end user partner AAHD presented our project at the Research and Innovation Symposium for European Security and Defence (RISE-SD) (https://rise-sd.net) on June 2, 2022.



6.4 The Projects to Policy Seminar, Brussels, Belgium

Yildiray Kabak from SRDC participated in the Projects to Policy Seminar (Brussels, 30 June, 1 July 2022) to present TeamAware project and find collaboration opportunities with other related H2020 projects.

6.5 GITEX 2022 exhibition and trade fair, Dubai, UAE

On 10-14 October 2022, 20 of the most promising EIC- funded SMEs, start-ups and scale-ups with outstanding digital solutions, met in Dubai, UAE at GITEX 2022. The biggest technology event in Middle East brought together key international industry players and pioneering innovators, ensuring that attendees will gain insights and strengthen business ties with global tech giants.

Being a part of the European Pavilion, DUNE was one of the 4 EIC-backed companies that participated in diverse pitching sessions and speaking opportunities, presenting the TeamAware solution.

Smashing geographic boundaries, North Star Dubai welcomed the biggest international names in the tech world and hosted the world's largest start-up event, in which **5 companies of the European Pavilion** (JADBio, OrbitalAds, OutThink, Svelte and TreaTech) impressed the audience with their outstanding advancements. Being a part of the European Pavilion, **4 EIC-backed companies** (Neurolytics, CardLab Innovation, Solarbox and DUNE) participated in diverse pitching sessions and speaking opportunities, presenting their revolutionary solutions.

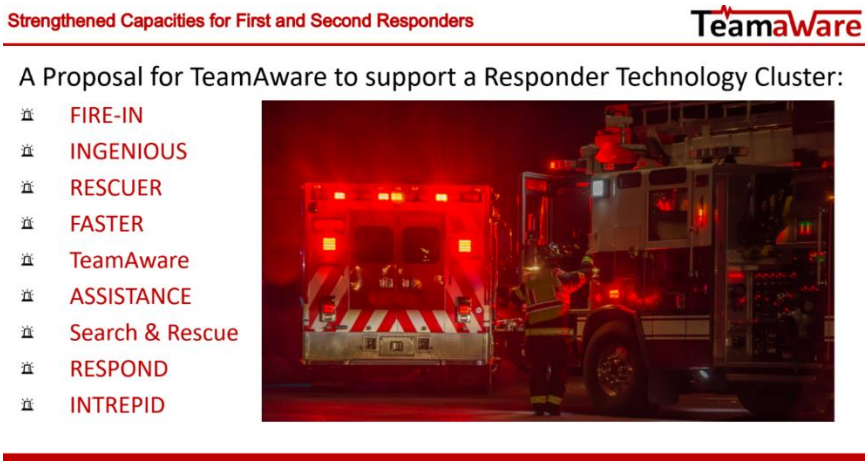
6.6 Foro 2E+I Forum, Toledo, Spain

AITEX presented the TeamAware project at Foro 2E+I Forum, Toledo, Spain, on October 10-11, 2022.

6.7 Disaster Resilience Societies Cluster Conference by CERIS

The TeamAware partners were in Brussels (November 7-10, 2022) with the European Research Agency (REA) and DG HOME, the managers of the CERIS event, which project partners RAN organised through CMINE.eu.

The event was split into 6 mini-conferences, one of which was focused on TeamAware's main area of interest: Technologies for First and Second responders. Nearly 600 people had registered for the event to hear a presentation describing the TeamAware project, how it was proceeding, plans for the interim demonstrations in Ankara and its next ambitions.



In this event, a number of other projects immediately expressed a wish to create a more formal grouping with TeamAware and to hold regular meetings to discuss how to work together more in the future. It was explained that the new Cluster would be one of two new forums being created on the back of the successes of the Societal Resilience Cluster.

6.8 SPOMT2022, 5th International Symposium on Precision Opto-Mechatronics Technology

DUNE presented the TeamAware project at the SPOMT2022 conference on November 18th, 2022, through an invited lecture.

6.9 TeamAware Workshop at "İzmir Demokrasi University International Congress of Health Sciences (ICHES-IDU 2022)"

TeamAware partner AAHD organized a TeamAware workshop at "İzmir Demokrasi University International Congress of Health Sciences (ICHES-IDU 2022)" together with the iPROCURESECURITY Project on October 24, 2023, see http://iches.idu.edu.tr/

6.10 Demonstration of COILS to Czech Firefighters

TeamAware partner DUNE demonstrated its COILS system to service members and officers of the Czech Republic Firefighters, Police, and Army on February 16, 2023 at the training facility of the Prague department of the firefighters.

6.11 Thales VAR (Vision Autonomy and Robotic learning) presents innovative localization module for humans and robots at Research Days (Internal Thales Event), Palaiseau

Thales, a leader in technology solutions, presented a cutting-edge localisation module based on an IMU and a camera at the Research Days event in Palaiseau, France, on October 11st - 14th, 2022.

The localisation module uses an IMU (inertial measurement unit) and a camera to precisely locate and track humans and robots in complex environments, such as industrial plants, airports, or military bases. It provides real-time positioning information that enables humans and robots to navigate, avoid obstacles, and optimise their performance. The module's accuracy and robustness make it particularly useful for challenging applications where GPS signals may be unavailable or unreliable, such as indoor areas or urban canyons.

The VAR team showcased the module's potential applications, including robotics, surveillance, and emergency response.

The Research Days event was an excellent opportunity for Thales and its business lines across Europe to come together and share the latest innovations in technology. Thales VAR team was proud to contribute to this event with its localisation module, which has the potential to transform the way humans and robots navigate in challenging environments.

6.12 New Generation Technologies in Emergencies and Disasters, DootorClub, Emergency Association of Turkey

Dr. Turhan Sofuoğlu presented the TeamAware Project at Emergency Management webinar by Emergency Association of Turkey on March 21, 2023.

6.13 EENA Conference & Exhibition 2023, 19-21 April, Ljubljana, Slovenia

TeamAware partner AAHD participated in the EENA Conference 2023 on 19-21 April in Ljubljana. AAHD made the opening speech on "Emergency Response to 2023 Earthquake in Turkey" and present TeamAware project.


eena
EUROPEAN EMERGENCY NUMBER ASSOCIATION
EENA Conference & Exhibition 2023
19-21 april, Ljubljana (Slovenia)
EXPLORE THE PROGRAMME
Explore the programme
Check the floor plan


Programme overvie
Wednesday 19th of April
Thursday 20th of April
Introduction
Emergency Response to the 2023 Earthquake in Türkiye
Towards a new era in emergency comms & response
How to address future challenges on caller location?
Supporting citizens' involvement in the chain of survival
Visit of the exhibition
AED Mapping
What data do you need to see?
Lunch & visit of the exhibition
Public Warning implementation in France
Defining call-takers question tree
Industry session: Cloud-based CADs & NG emergency comms
NG112 - Progress update
The great resignation
Industry session
Networking Cocktail & Visit of the Exhibition
112 Awards Ceremony
Networking Cocktail
Ensuring seamless emergency comms during 2G/3G shutdown
Ensuring continuity of emergency comms & PW with satellite applications
Sorry companies, we made our own software
Industry session: Data Platform
Implement Real-Time Text in the EAA framework
Diversification of Public Warning channels
Interactive Voice Response to answer emergency comms
Industry session
International perspective on NG emergency comms
Data Exchange between emergency services organisations
Involving citizens in disaster mgt.
Industry session
Lunch & visit of the exhibition
Conveyance of emergency comms to PSAPs via TPSPs
Electric Vehicles: new challenges & opportunities
Research Corner in partnership with ISCRAM
Industry session
Next Generation eCall
Additional data in emergency comms mgt.
Emergency comms handling around the World
Masterclass: AI & Chatbot
The new era of Mission Critical Comms
Successes of PSAP comms
Guidance on the scope of Delegated Regulation 2023/444
Social Event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EUROPEAN EMERGENCY NUMBER ASSOCIATION
Todd Piett
VP at Rave Mobile Safety, A Motorola Solutions Company
Toufic Saad
Head of ICT for the emergency communications centre for police and fire at Cantonal Police of Valais (Switzerland)
Trey Forgety
Turhan Sofuoglu
President of Emergency Disaster Ambulance Physicians Association at
EENA.ORG


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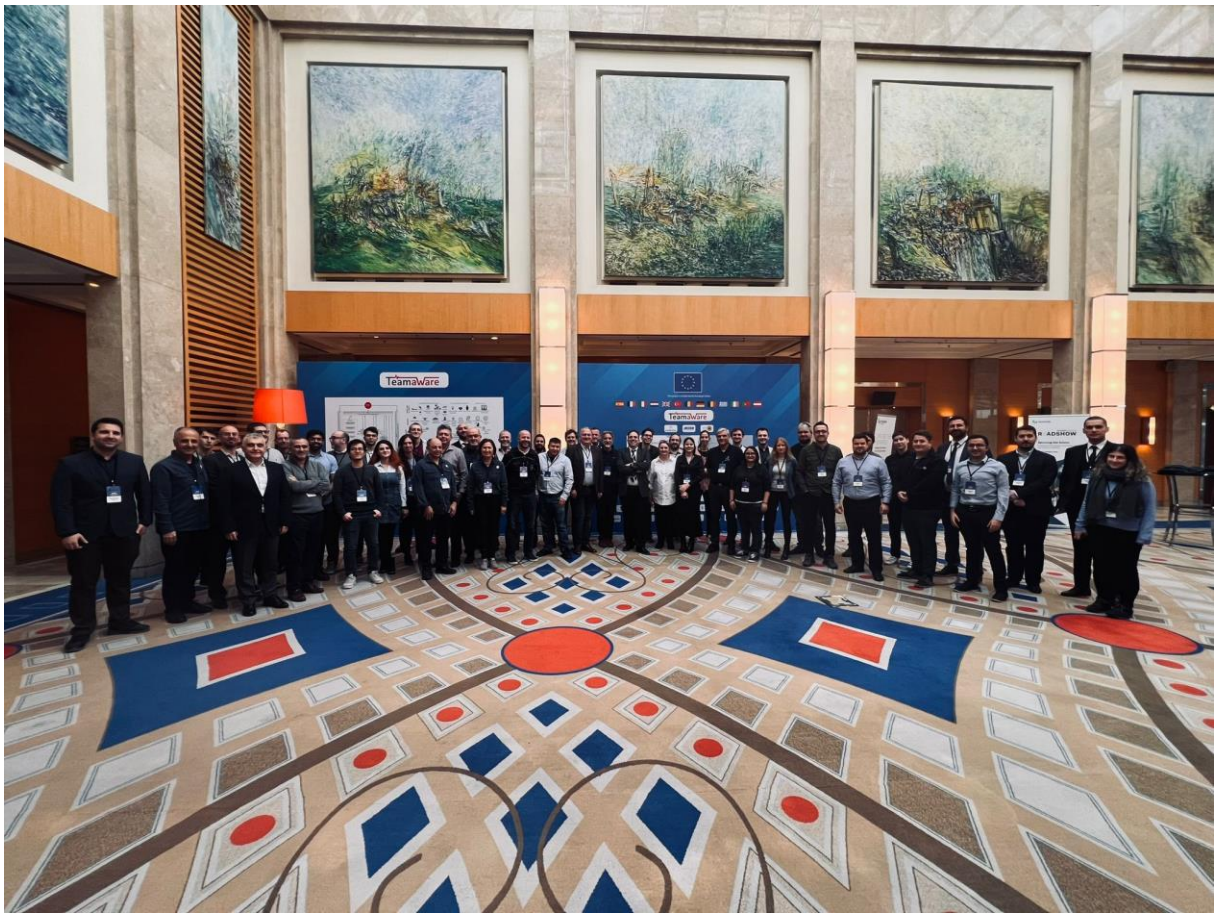
Vitor Judícibus
Head of Critical Communications Multidisciplinary Team at SGMAI - General Secretariat of the Ministry of Internal Administration
Walter Occelli
Regional Director at Centrale Unica di Risposta NUE 112
Wolfgang Kampichler
Principal Scientist at Frequentis AG
Zeynep Sofuoglu
Senior Project Manager, Assoc. Prof. Dr. at AAHD Emergency, Disaster, Ambulance Physicians Association
EENA.ORG

7 Ankara International Workshop

Finally, the TeamAware consortium had the first internal demonstration in Ankara in the last week of November 2022. It was very beneficial from both technical and demo perspectives.

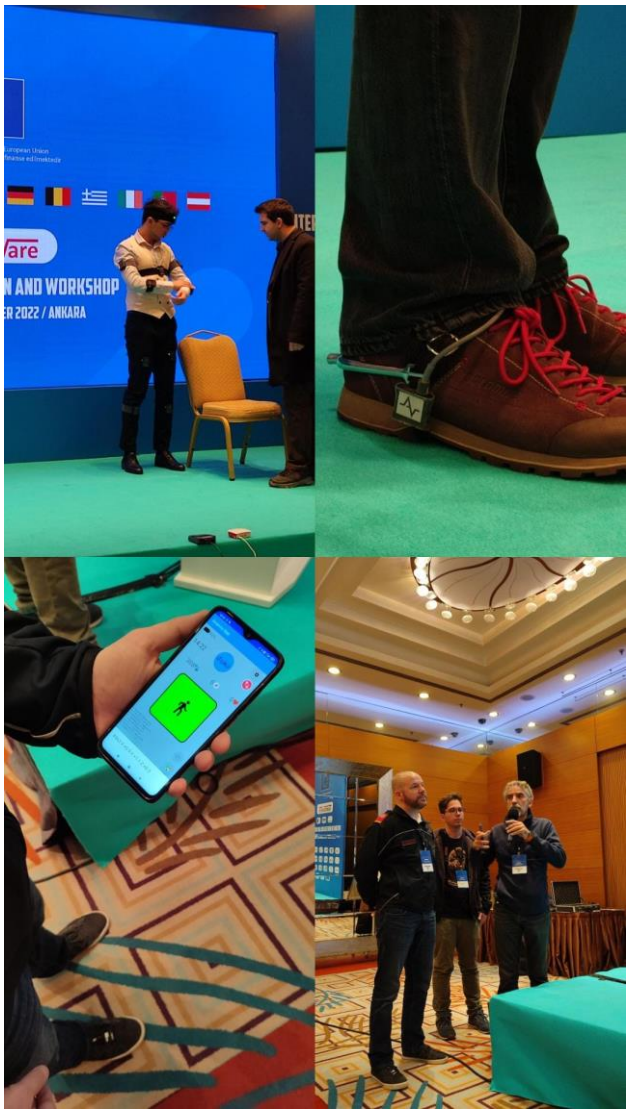


The format of the demonstrations was desktop / testbed based (in Hackathon style). Each solution had its own demonstration time allocated as well as a workshop facility for discussing their needs with TeamAware integrated system providers. Each solution provider has been contacted to establish their infrastructure requirements and for their initial thoughts on how they would like to conduct the demonstration. This meeting was the first opportunity for end users to meet face-to-face with technical partners who demonstrated their progress in fulfilling the objectives of the project. Wherever possible End Users were able to use prototype products as part of the demonstration and were able to see solutions in action and provide feedback to the developers through a structured process of evaluation.

The event mainly incorporated:

- Initial End User Awareness Training on each of the solutions
- Review of the draft training manual from D13.2
- Mid-term demonstrations of the developments from work packages 3 to 6
- Mid-term demonstrations of the developments from work packages 9 to 11
- Initial evaluation and feedback of work packages 3 to 9
- Technical Partners Meetings


WP7 COILS
Wearable segment
Real Test in Ankara Sheraton Hotel with photo
AMS Motion Unit
Step 3: IMS screening output analysis
• Output examples (report, annotated frames, etc.)
INTERIM DEMONSTRATION AND WORKSHOP
28 NOVEMBER - 02 DECEMBER 2022 / ANKARA


AND WORKSHOP
2022 / ANKARA


TeamaWare

8 Social Media Activities

In the TeamAware project, the social media activities currently run on two channels: Twitter and LinkedIn.

8.1 Twitter

The TeamAware Twitter account (https://twitter.com/TeamAware_EU) is active nearly from the beginning of the project. The consortium is quite active in this platform and regularly updates the followers about the project results. In this section, the visitor statistics are presented for month March 2023.

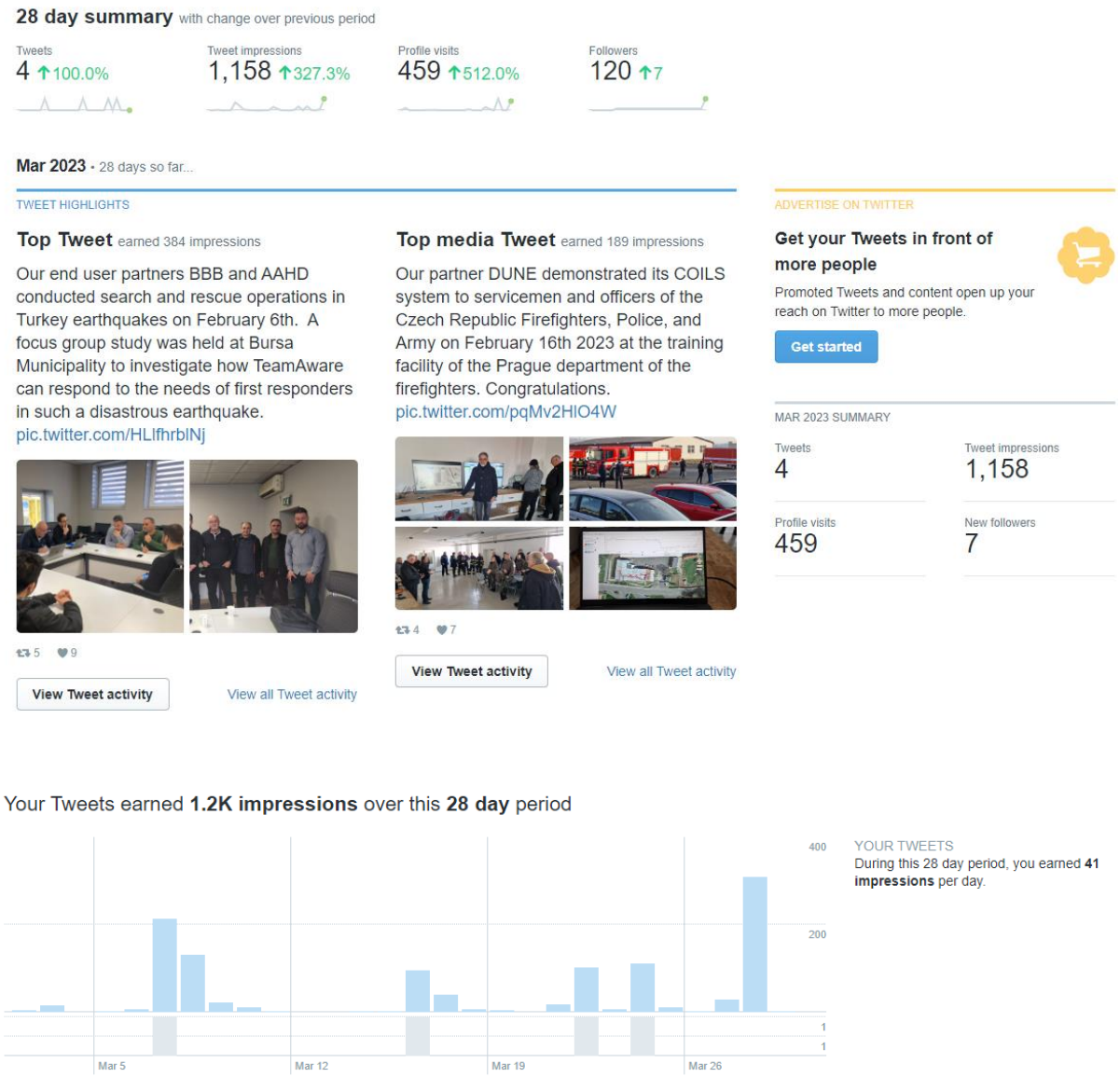


Figure 2 Number of impressions for March 2022

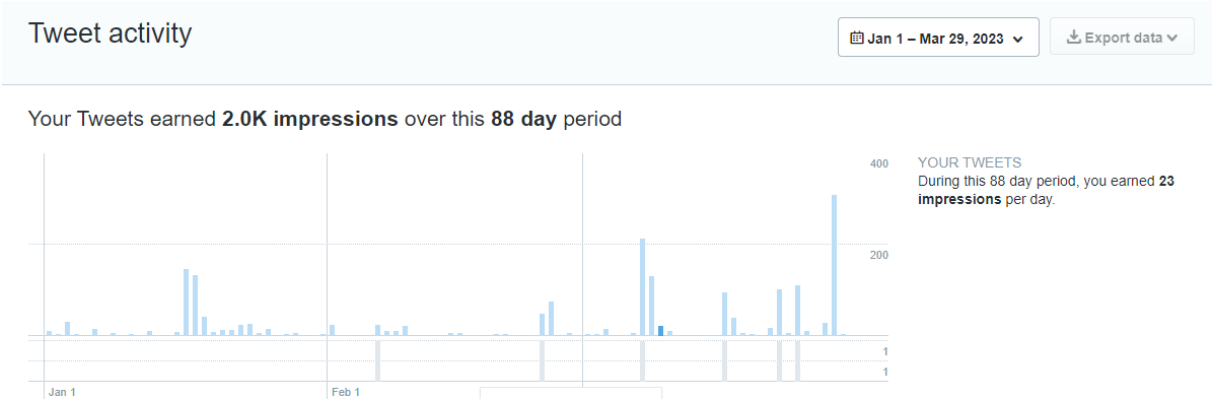
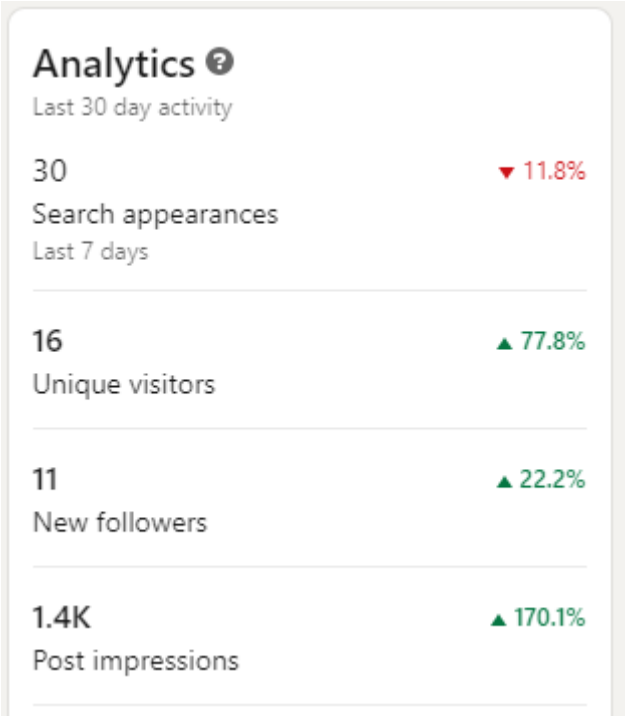
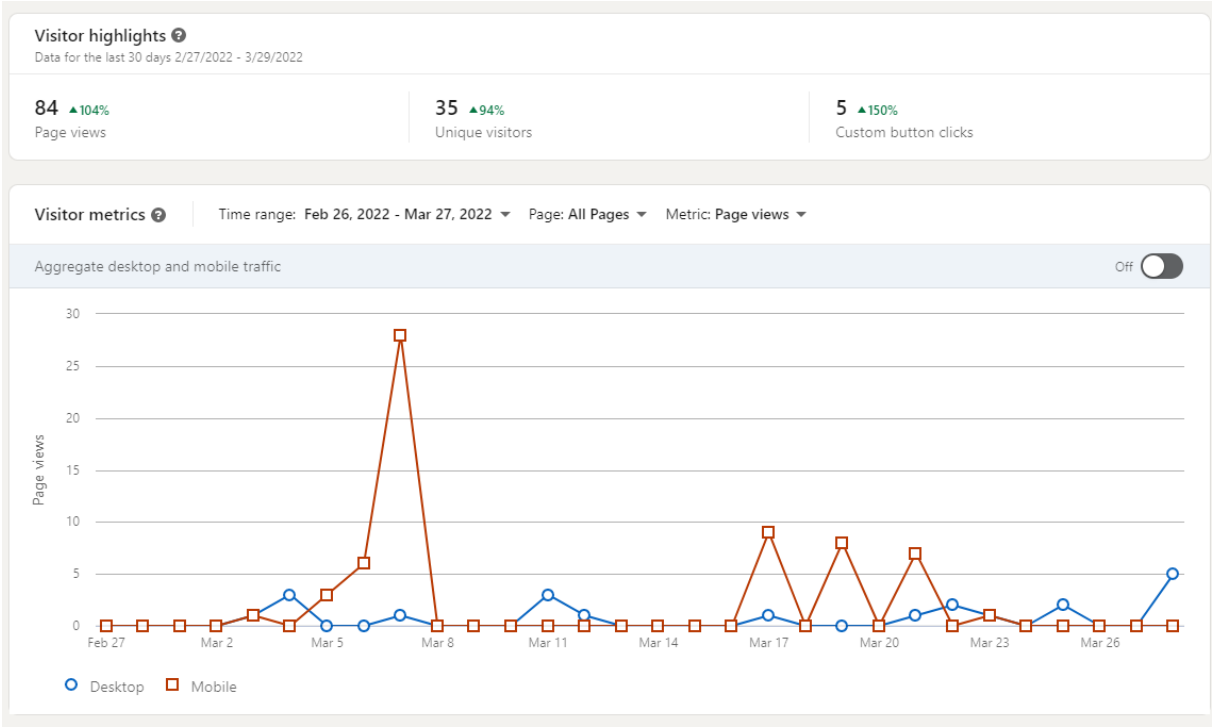


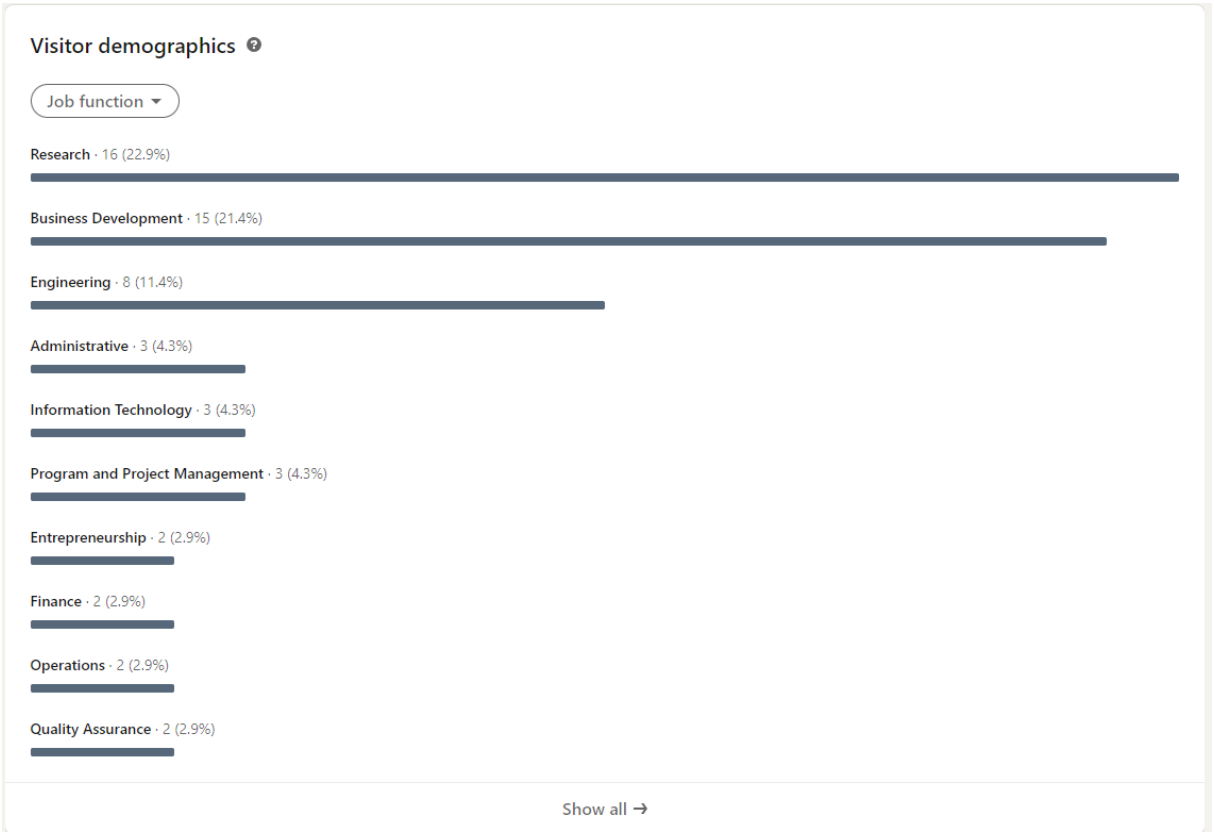
Figure 3 General statistics for the Twitter Platform last three months

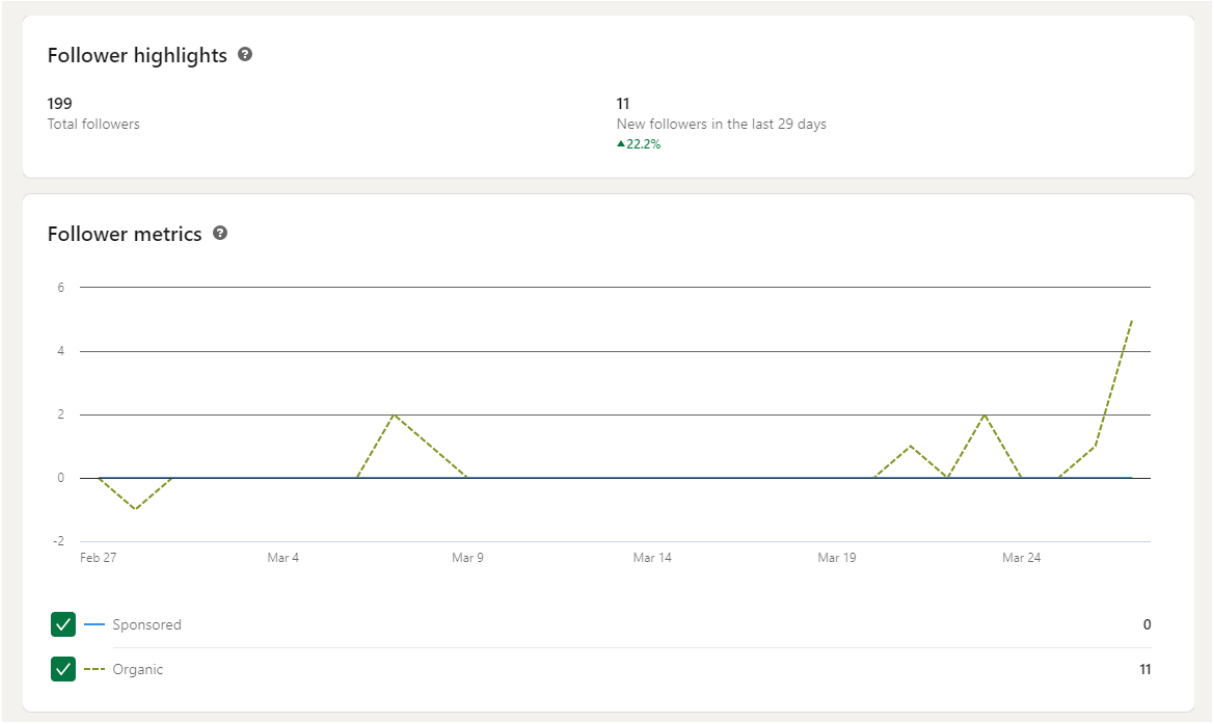
8.2 LinkedIn

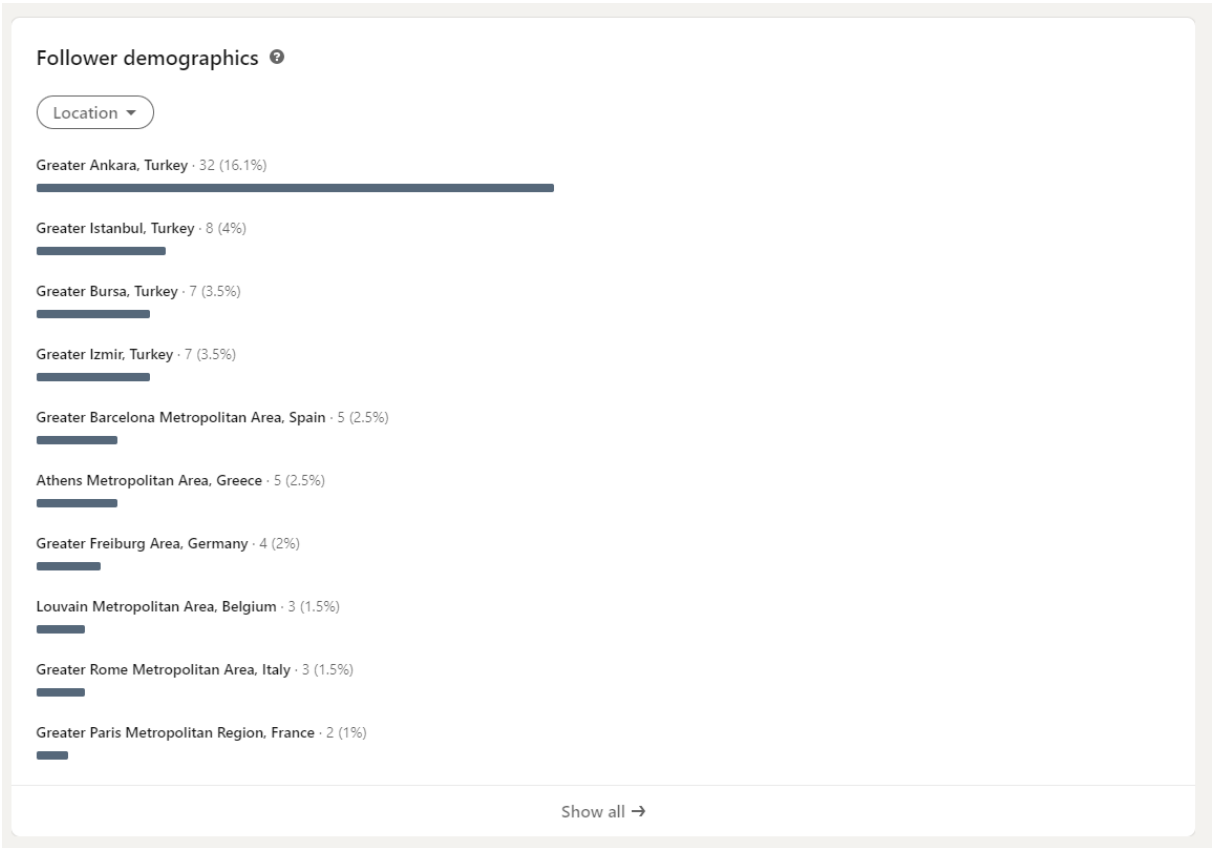
The TeamAware LinkedIn page (https://www.linkedin.com/company/teamaware-eu/) is active nearly from the beginning of the project. TeamAware is quite active in this platform. In this section the visitor statistics are presented for month March 2023.

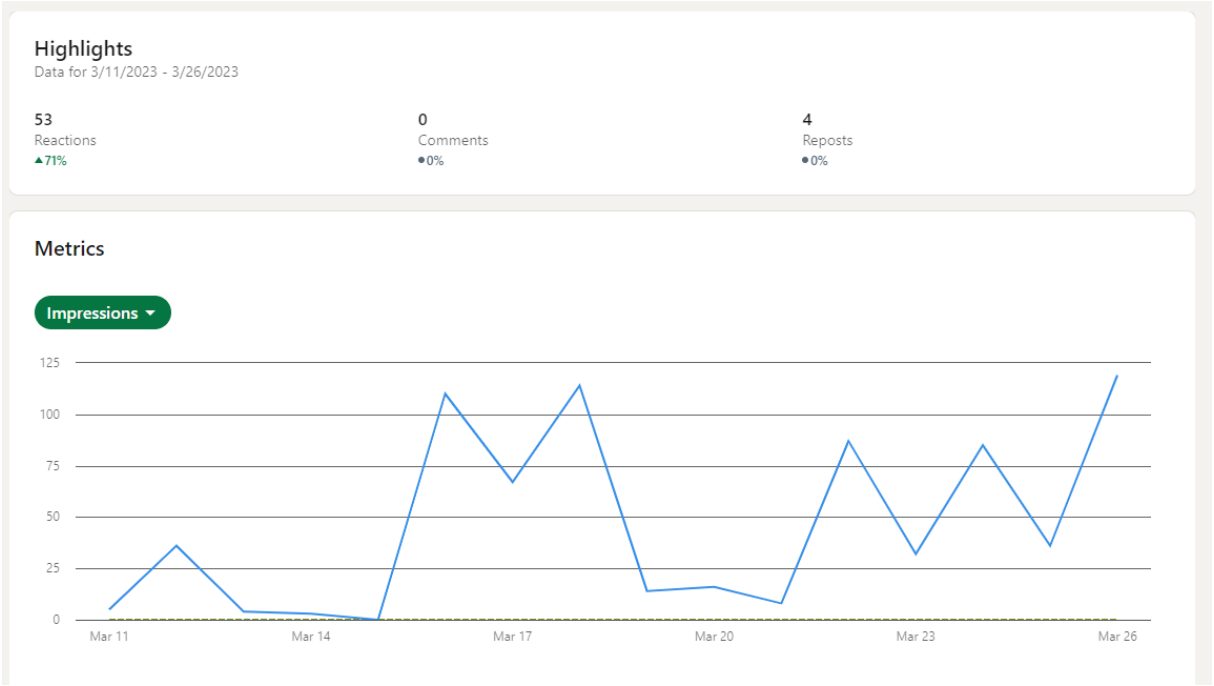



Visitor highlights
Data for the last 30 days 2/27/2022 - 3/29/2022
84 ▲104%
Page views
35 ▲94%
Unique visitors
5 ▲150%
Custom button clicks
Visitor metrics
Time range: Feb 26, 2022 - Mar 27, 2022
Page: All Pages
Metric: Page views
Aggregate desktop and mobile traffic
Off
30
25
20
15
10
5
0
Page views
Feb 27
Mar 2
Mar 5
Mar 8
Mar 11
Mar 14
Mar 17
Mar 20
Mar 23
Mar 26
Desktop
Mobile


Visitor demographics
Job function
Research · 16 (22.9%)
Business Development · 15 (21.4%)
Engineering · 8 (11.4%)
Administrative · 3 (4.3%)
Information Technology · 3 (4.3%)
Program and Project Management · 3 (4.3%)
Entrepreneurship · 2 (2.9%)
Finance · 2 (2.9%)
Operations · 2 (2.9%)
Quality Assurance · 2 (2.9%)
Show all →


Follower highlights
199
Total followers
11
New followers in the last 29 days
▲22.2%
Follower metrics
6
4
2
0
-2
Feb 27
Mar 4
Mar 9
Mar 14
Mar 19
Mar 24
Sponsored
0
Organic
11


Follower demographics
Location
Greater Ankara, Turkey · 32 (16.1%)
Greater Istanbul, Turkey · 8 (4%)
Greater Bursa, Turkey · 7 (3.5%)
Greater Izmir, Turkey · 7 (3.5%)
Greater Barcelona Metropolitan Area, Spain · 5 (2.5%)
Athens Metropolitan Area, Greece · 5 (2.5%)
Greater Freiburg Area, Germany · 4 (2%)
Louvain Metropolitan Area, Belgium · 3 (1.5%)
Greater Rome Metropolitan Area, Italy · 3 (1.5%)
Greater Paris Metropolitan Region, France · 2 (1%)
Show all →



9 Lectures

TeamAware partner DUNE gave a lecture about TeamAware in the symposium:

TeamAware: MEMS technologies and localisation capabilities: new paradigms for the IMU-GNSS fusion

Enrico de Marinis, Fabrizio Pucci, Michele Uliana, Fabio Andreucci,

5th International Symposium on Precision Opto-Mechatronics Technology, November 18th, 2022, Beijing, People's Republic of China

10 Web Site Activities

10.1 Google Analytics

The TeamAware consortium uses the web site quite effectively. The dissemination team installed Google Analytics system to monitor the statistics. In this section, these statistics are presented. As of writing (month March 2022) of this deliverable, all the figures are for March 2022. (It should be noted that the numbers will increase as more project results are shown to promote dissemination activities).

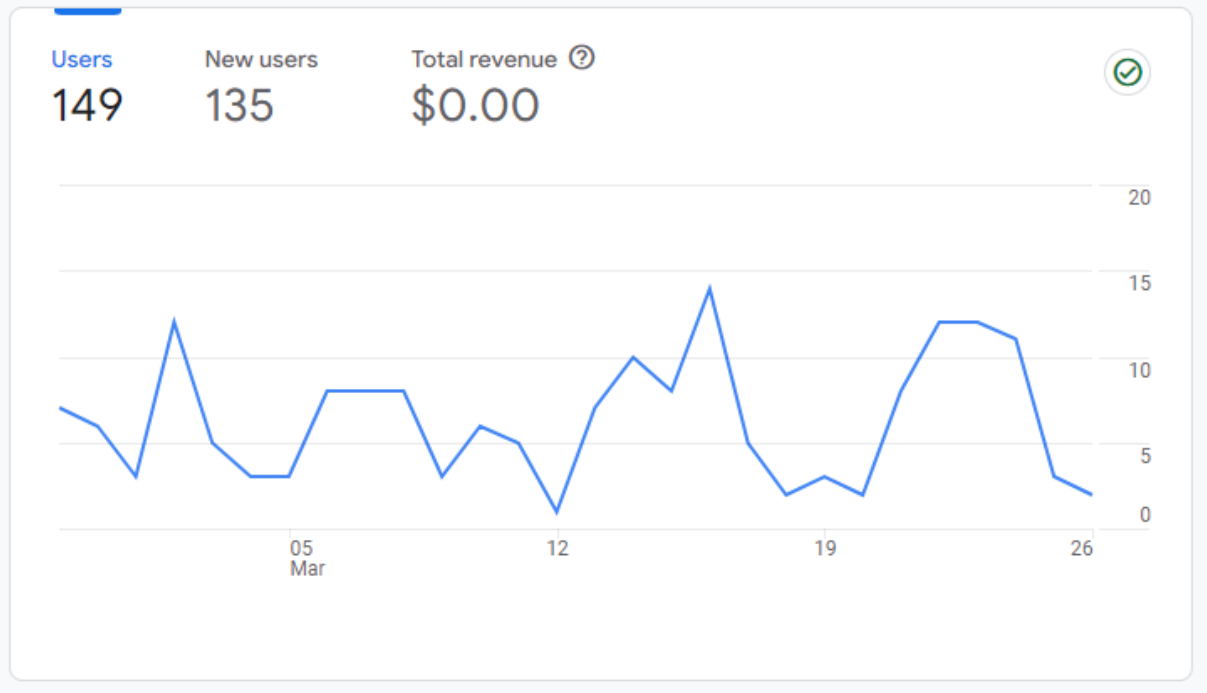


Figure 4 Number of users

As shown in the above figure, the TeamAware web site has been visited by 149 users in a month. Also, the TeamAware site has users from all over the world as shown in the following figure.

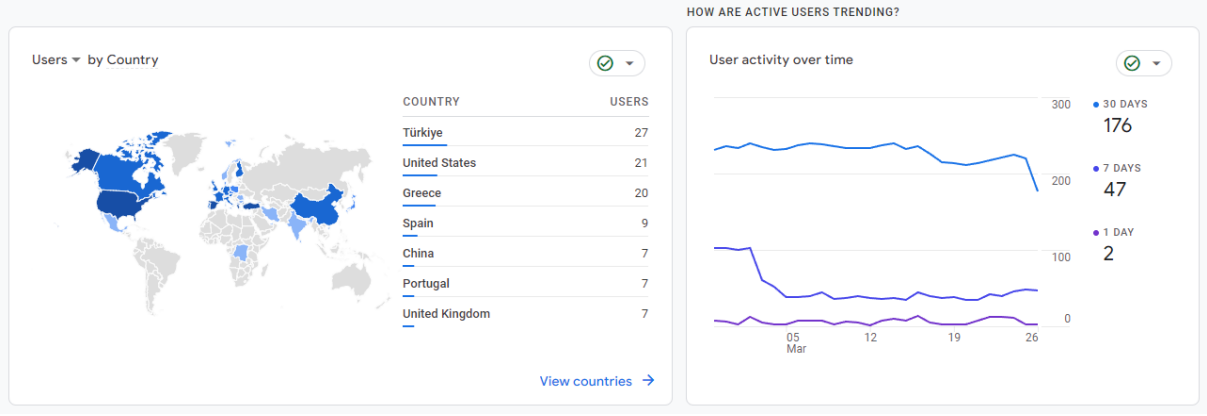


Figure 5 Users by Country and activity over time

The following figure presents which pages are visited most on the TeamAware web site.

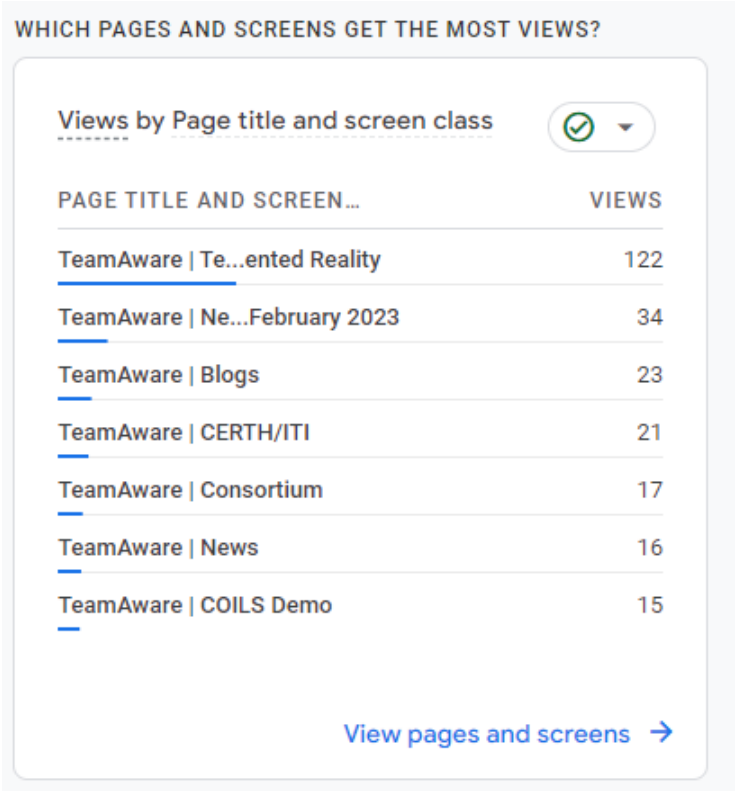


Figure 6 Which pages and screens get the most views

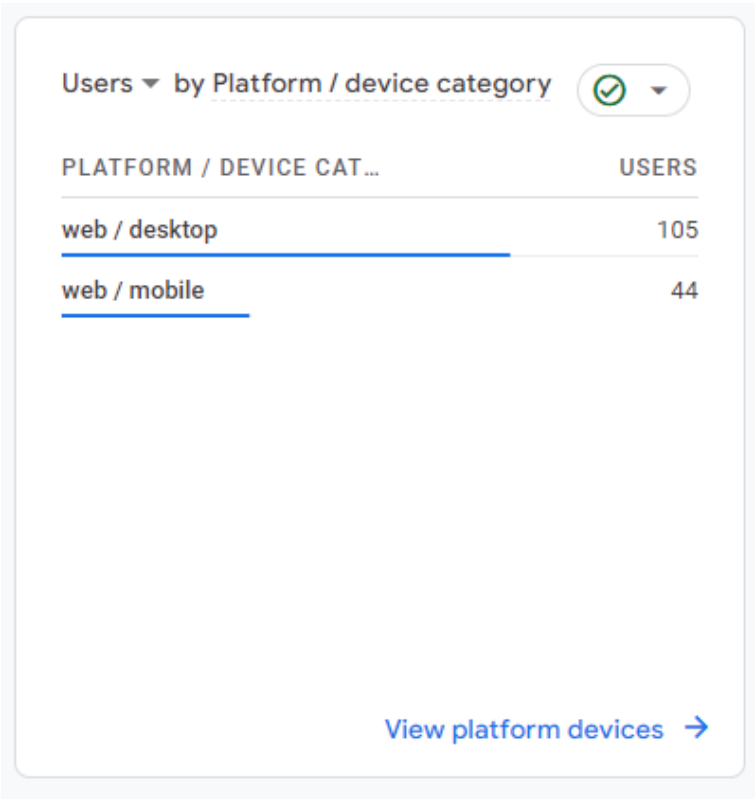


Figure 7 Users by platform

The TeamAware website has users from both desktop and mobile platforms. Furthermore, the following figure shows how the web site is discovered on the web. It is very good that TeamAware is discovered by native search results (Organic search refers to the search results of a search engine that cannot be influenced by paid advertising. Organic search results are ranked according to their relevance to the search term. Organic search results therefore do not include adverts, but can include search snippets such as maps, images, articles or the knowledge graph).

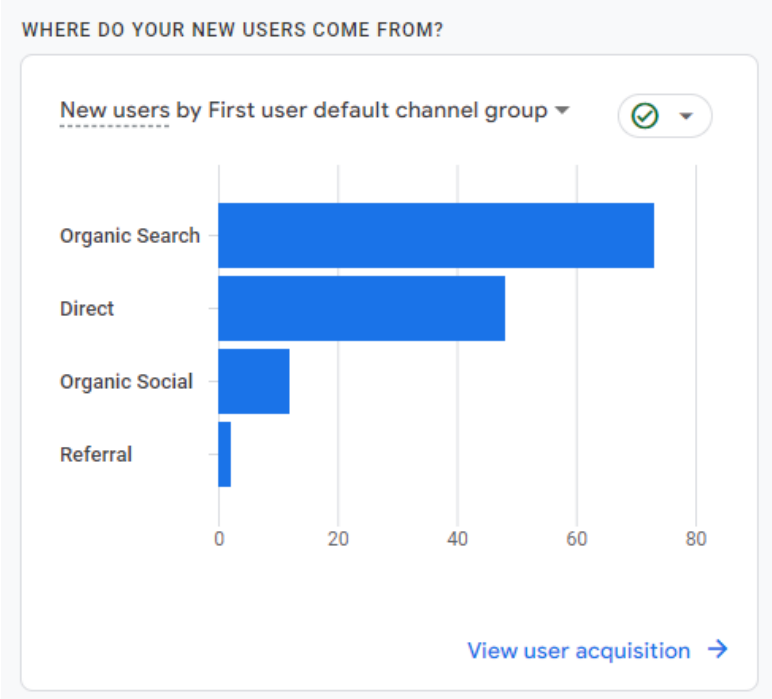


Figure 8 How is the TeamAware website found on the web?

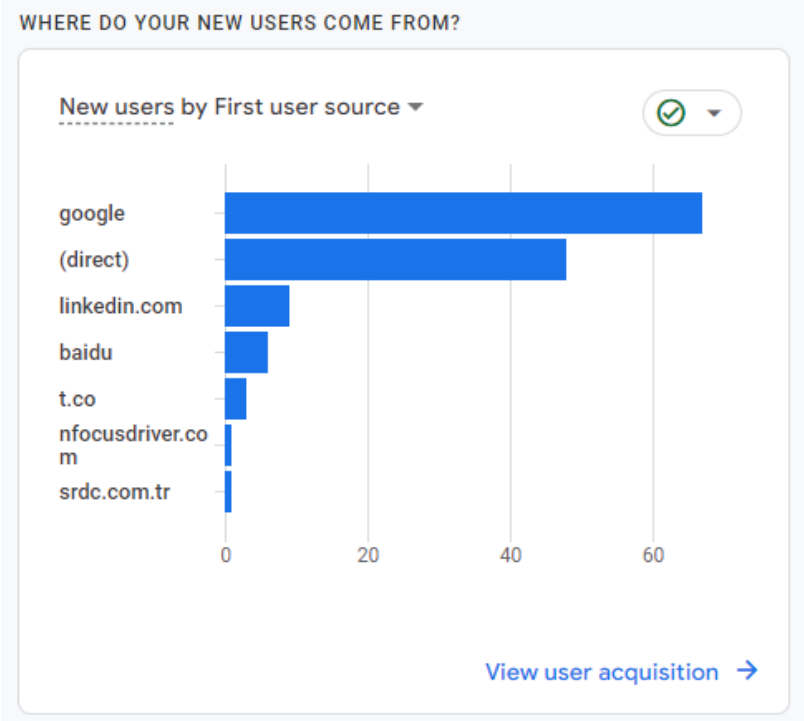


Figure 9 From which platforms do users access the web site

10.2 Blogs

10.2.1 The ITI-CERTH

Mar 24, 2023 | Blogs

The Information Technologies Institute (ITI) was founded in 1998 as a non-profit organisation under the auspices of the General Secretariat for Research and Technology of the Greek Ministry of Development, with its head office located in Thessaloniki, Greece. Since 10/03/2000 it is a founding member of CERTH.

CERTH/ITI is one of the leading Institutions of Greece in the fields of Informatics, Telematics and Telecommunications, with long experience in numerous European and national R&D projects. It is active in a large number of application sectors (energy, buildings and construction, health, manufacturing, robotics, (cyber)security, transport, smart cities, space, agri-food, marine and blue growth, water, etc.) and technology areas such as data and visual analytics, data mining, machine and deep learning, virtual and augmented reality, image processing, computer and cognitive vision, human computer interaction, IoT and communication technologies, navigation technologies, cloud and computing technologies, distributed ledger technologies (blockchain), (semantic) interoperability, system integration, mobile and web applications, hardware design and development, smart grid technologies and solutions and social media analysis.

CERTH/ITI has participated in more than 380 research projects funded by the European Commission (FP5-FP6-FP7 & H2020 – in more than 115 H2020 projects) and more than 100 research projects funded by Greek National Research Programmes and Consulting Subcontracts with the Private Sector (Industry). The current ITI projects consist of 116 ongoing projects (including EU and national projects, contracts and services), which are currently active with a total budget of 41.938k€.

For the last 10 years, the publication record of ITI includes more than 330 scientific publications in international journals, more than 780 publications in conferences and 100 books and book chapters. These works have been cited more than 7.500 times.

CERTH/ITI has a staff of 393 people (including 9 researchers, 284 research assistants, 80 Postdoctoral Research Fellows, 10 Collaborative Faculty Members, 13 Administrative and Technical Employees).

Role within the project TeamAware:

CERTH/ITI primarily partakes in WP6 (“Acoustic Detection System”) with developing algorithms for the detection and localisation of emergency events such as explosions, gunshots and snipers as well as human voices (e.g., screams asking for help) and whistling in the operations, using an acoustic vector sensor. In particular, CERTH/ITI is a Task Leader in T6.2 (“Overlapping acoustic event detection”) which aims at the recognition of overlapping acoustic events. CERTH/ITI also participates in Task 6.1 (“Acoustic event analysis and detection”) which focuses primarily on the design of the ADS architecture and the implementation of algorithms for Single-event detection (SED) and Task 6.3 (“System validation”) which evaluates the final system in the tested environment.

Moreover, CERTH/ITI participates in WP2 (“System Architecture Specification and Design”) which provides the requirements and architectural design for the ADS. This information will be the basis for

the development of each of the components and algorithms in WP6. Also, WP6 will feed the platform software in WP10 (“TeamAware AI Platform Software”) and will help to increase the confidence of the detected events, by performing fusion with the other modalities (T10.1). Furthermore, WP6 will also feed the user interface in WP11 (“TeamAware AR/Mobile Interfaces”). Moreover, WP6 will have an interface with communication and network infrastructure from WP9 (“Secure and Standardised Communication Network") (T9.4). Finally, WP6 will take part in WP12 (“Integration and Test”) (T12.1) and WP13 (“Demonstration and Validation”) (T13.4).

Acoustic Detection System:

The objective of WP6 in the TeamAware project is to develop a system that can detect and localise emergency events for search and rescue purposes, including explosions, gunshots, human voices such as screams for help, and whistling. To achieve this objective, an Acoustic Vector Sensor (AVS) array will be mounted on an Unmanned Aerial Vehicle (UAV) along with a Raspberry Pi 4B for running the necessary algorithms. The needs and requirements of the Acoustic Detection System (ADS) for first responders have been defined in this context. Moreover, the role of the ADS in demonstration scenarios has been outlined, and communication protocols with the TeamAware platform have been established. Additionally, a literature review of audio-based surveillance systems similar to the one being developed has been conducted to gain insight into best practices and potential improvements.

To address the objectives of the ADS, public datasets containing recordings of the required target classes were collected from AudioSet, FSD50K, and MIVIA. In order to improve model training, a preprocessing step was applied to remove outliers from the weakly labeled data in AudioSet and FSD50K. Subsequently, unsupervised anomaly detection methods, such as K-Means and DBSCAN based on the MFCC features of the recordings, were employed to create a more beneficial and accurate dataset for model training. Figure 1 displays the clustering application, demonstrating the distribution of MFCC characteristics for the Male Speech (a) and Traffic Noise (b) target classes. Recordings that belong to cluster 1 were retained and used for training in both cases.

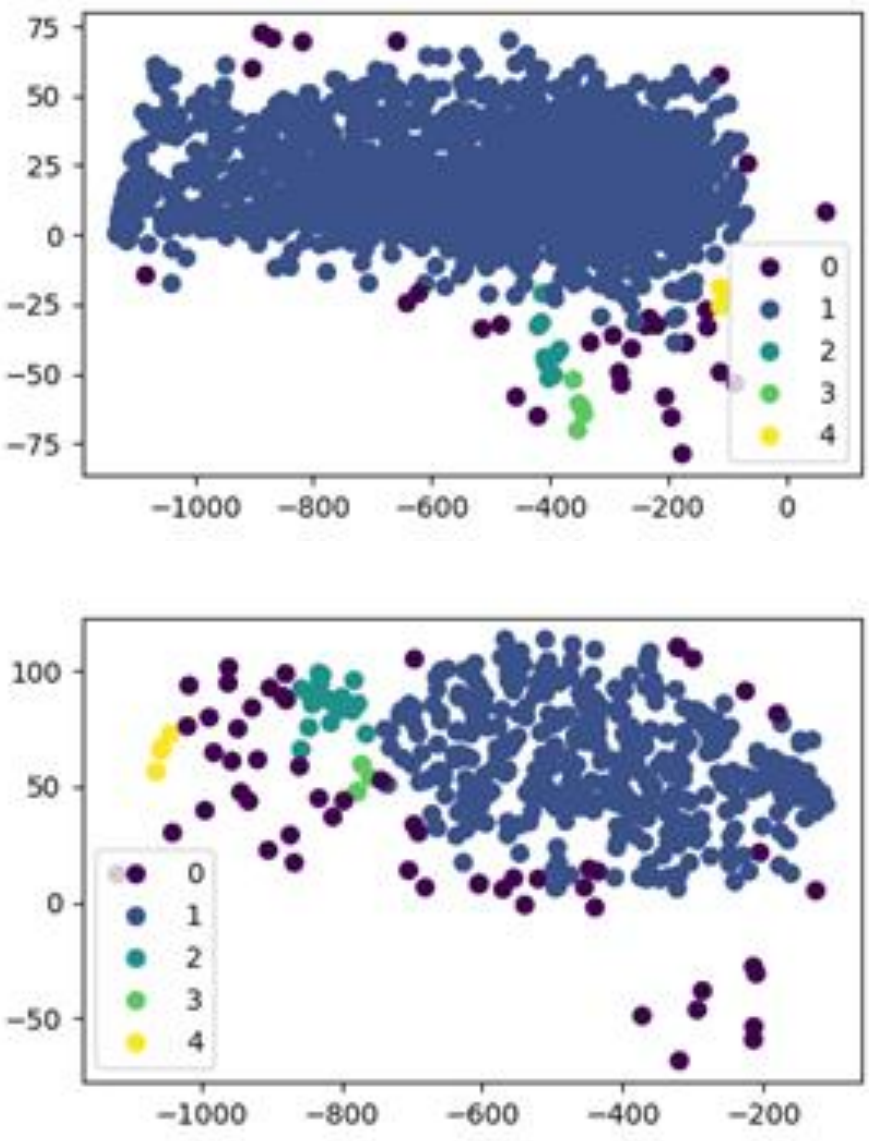


Figure 10. Distribution and clustering of MFCC for (a) Male speech and (b) Traffic noise recordings

One of the challenges in this task is the detection of overlapping sound events e.g., a scream overlapped with a police siren. Therefore, deep learning algorithms for single and overlapping sound events detection were implemented.

To extract features for the single event detection algorithm, Short-time Fourier transform (STFT) spectrogram magnitude representations were used and converted into 128 by 257 pixels grayscale images. Additionally, mel-spectrogram features were also extracted and tested in various deep learning architectures, including DenseNet-121, MobileNetV2, and a custom CNN model. The models were optimised to be lightweight for integration into the Raspberry Pi 4B. Loading and inference time were calculated, and F1-Scores were compared to select the most appropriate prediction model. The custom CNN model was integrated to run in real-time on the Raspberry Pi and output predictions every second. The performance of the model on unseen data in terms of precision, recall, and F1-Score were 0.6036, 0.5309, and 0.5464, respectively. The confusion matrix extracted from testing on unseen data

is shown in Figure. The target classes, ranging from 0 to 11, represent Aircraft, Explosion, Female Speech, Gunshot, Male Speech, Background Noise, Screaming, Police siren, Thunder, Traffic Noise, UAV Noise, and Vehicle Horn, respectively.

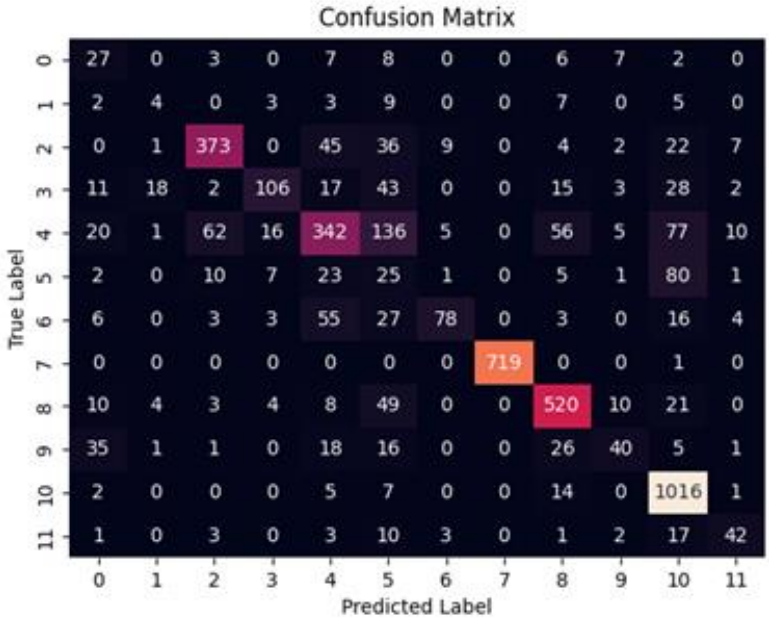


Figure 11. Confusion matrix of testing on unseen data

A custom two-dimensional CNN approach based on the YAMNet algorithm was employed for the overlapping event detection. To enhance the training process, an added class with mixup augmentation for overlapping events with a 30% mixture was introduced. Mel-spectrogram energies with a shape of 96 × 64 were used for feature extraction, and the algorithm produced classification results every second. The real-time integration of the algorithm was achieved on the ADS. Additionally, a visualisation tool was implemented to display the predicted labels. The tool uses a color scheme where the darker the color, the higher the probability score of the class. A screenshot of the tool is presented in Figure.

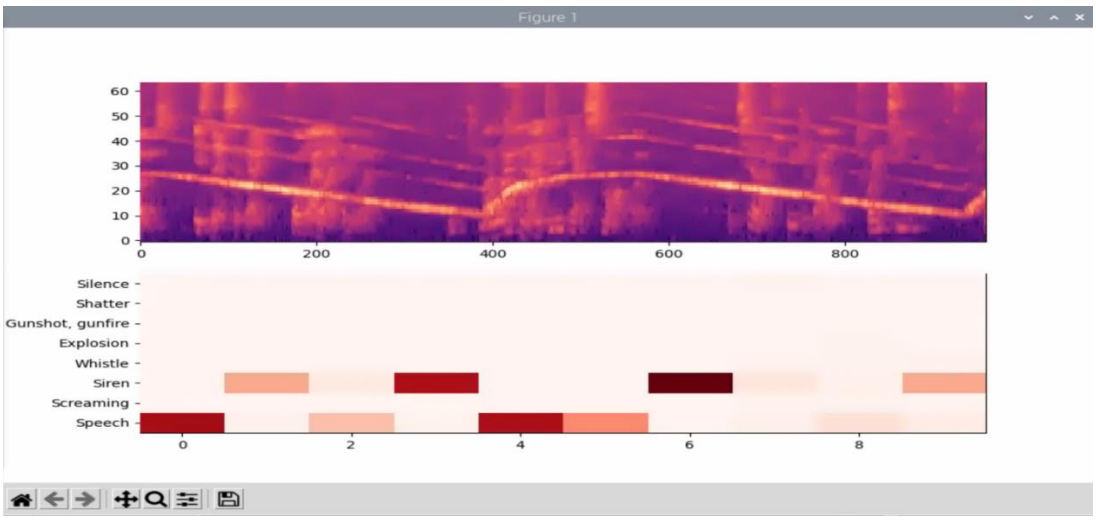


Figure 12. Visualisation of the overlapping sound event detection

The ODAS framework, optimised to run on low-cost embedded hardware such as the Raspberry Pi, was utilised for sound source localisation. Sound source localisation, tracking, and sound source separation were among the features that the ODAS framework provided, along with a web interface for visualisation. For each microphone pair, the Generalized Cross-Correlation with Phase Transform (GCC-PHAT) algorithm was utilised to determine the time-delay, cross-correlation, and cross-correlation lag times between signals to accurately identify the location of sound sources in real-time. To customise the ODAS framework for specific microphone properties, the configuration file was edited. An illustration of the ODAS Studio Web interface is shown in Figure.

A mid-term demonstration of the ADS was completed on November 29, 2022 in Ankara. The demonstration showcased the system's operating principles and capabilities in detecting and localising single and overlapping sound events in a real-time test scenario within an indoor environment. To further validate the system, various sound event scenarios, either standalone or overlapping, were tested in an outdoor environment at CERTH premises. In addition, a data capture is scheduled to take place at CERTH premises to evaluate and test the ADS capabilities. During the capture, the ADS will be mounted on a UAV to detect and localise sound events from various distances, simulating the conditions of the final demonstration.

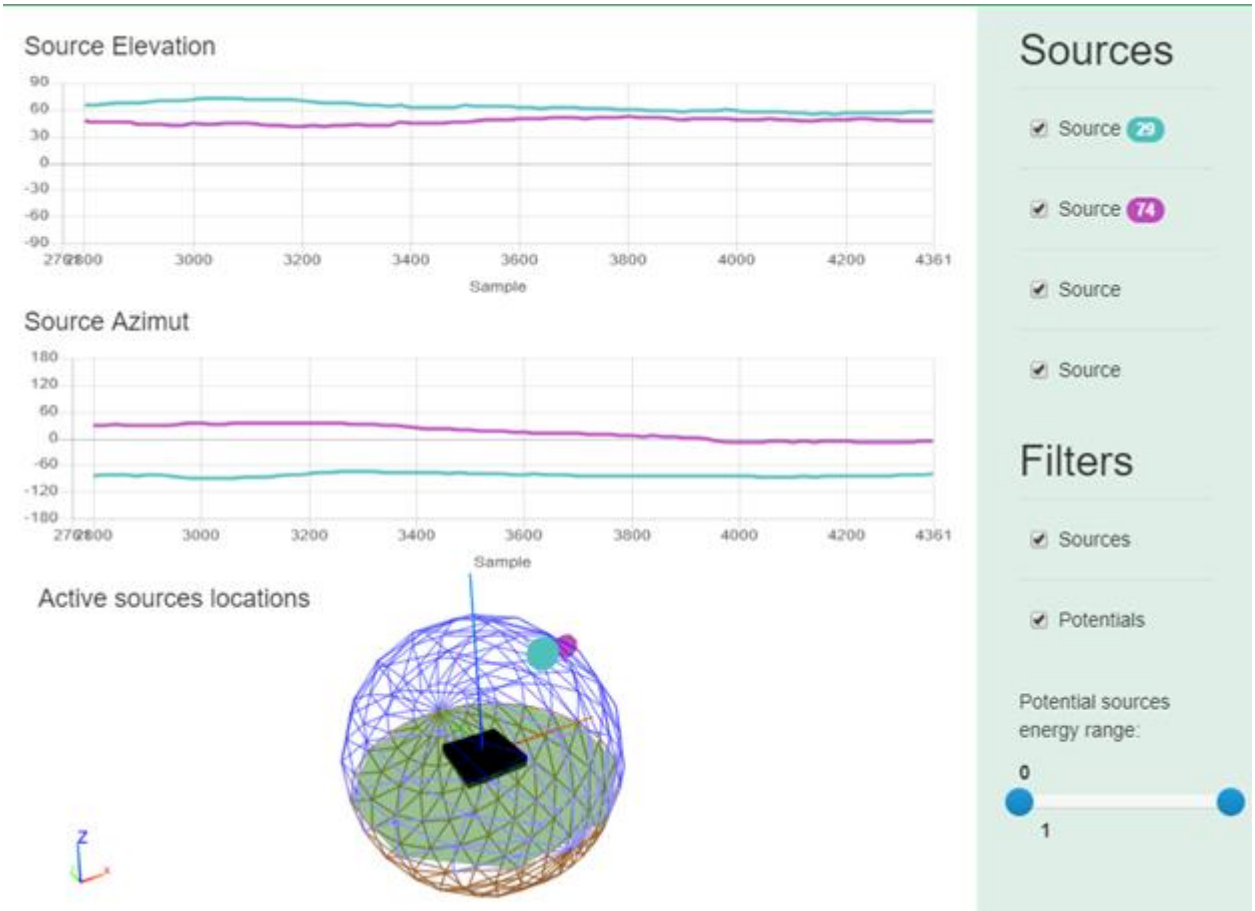


Figure 13. ODAS Studio Web Interface. Coloured lines represent the tracked sound source trajectories over time

10.2.2 Turkey hosts demonstration of new Search & Rescue technologies

Feb 24, 2023 | Blogs

In December, Ankara played host to the full TeamAware consortium for an impressive technical demonstration of its six responder technologies.

The event was attended by nearly 100 individuals over the course of a week, all of whom were eager to see the latest advances in the focus technologies:

- Visual Scene Analysis Systems
- Infrastructure Monitoring Systems
- Chemical Detection Systems
- Acoustic Detection Systems
- Team Monitoring Systems and
- Citizen Involvement and City Integration Systems

For those who are unfamiliar, responder technologies refer to the tools and equipment used by first responders to assist in emergency situations. This can include everything from communication devices to search and rescue equipment, and much more.

At the demonstration, attendees were treated to a wide range of these technologies and innovations. There were demonstrations of new communication systems that allow emergency responders to stay connected even in the most challenging of environments. There were also displays of new search and rescue tools that can help first responders locate and rescue victims more quickly and efficiently.

Perhaps most impressive, however, were the demonstrations of new drone technologies that can be used in emergency situations. Drones can be equipped with a range of sensors and cameras that allow them to provide a birds-eye view of the situation on the ground. This can be incredibly helpful in situations where access is limited, such as in the aftermath of a natural disaster such as we've just seen following the Earthquakes in Turkey and Syria.

In addition to the impressive technology on display, attendees were also able to participate in workshops and training sessions. For many attendees, this was an invaluable opportunity to learn new skills and techniques that they could bring back to their own organisations.

A further event is now planned whereby all of the technologies will be demonstrated as part of an integrated information and command system.

Overall, the technical demonstration of responder technologies was felt to be a huge success. Attendees were able to see first-hand the incredible advancements being made in this field, and many left feeling inspired and motivated to continue pushing the boundaries of what is possible. Director of the Resilience Advisors, Jon Hall (organisers of the demonstrations) said "It's events like these that help to ensure that TeamAware first responders have access to the very best tools and technologies, and that they are able to respond quickly and effectively in even the most challenging of situations. The research community has much to add to innovation in this area."

10.2.3 The TeamAware Augmented Reality Achievements

Feb 6, 2023 | Blogs

Interface Design:

The Augmented Reality (AR) interface is, together with the mobile interface, developed targeting the First Responders (FRs) deployed in the field. The FRs will be able to use this interface to consume the data generated by the TeamAware ecosystem. The application is designed to be used in the field under extreme circumstances. Therefore, the application will be easy to use, provide the most relevant information at a quick glance and doesn't impair the ability for the end user to do their work.

Imagine the scenario of an earthquake where the FRs need to enter a partially collapsed underground metro line to rescue people trapped in a train. The FRs include firefighters both helping with the extraction and extinguishing fires as well as medics assisting the victims. They are working in a challenging underground environment with restricted visibility and limited connectivity/communication, surrounded by changing circumstances and threats such as chemical dangers like toxic fumes, areas where the tunnel is in risk of collapse, etc.

Luciad (Hexagon) has been developing this AR interface as part of WP11 during the last 18 months. During this period, several iterations of the interface have been prototyped and feedback from the end users has been incorporated. This process culminated in the current version of the AR interface shown in the Ankara Midterm demonstration.

Figure 14: UI iterations, from first mockups to the advanced version shown on the midterm demonstration.

The AR application provides situational awareness to the first responders deployed in the field. It doesn't require the FRs to check any additional external device as the AR headsets are equipped since the beginning of the operation with minimal obstruction of the FR's field of view.

Thanks to the AR application, the FRs can see the results of the whole TeamAware project in real time, in an informative non-intrusive way.

The AR application will be tailored to suit the needs of each type of FR depending on their organization type (firefighter, medic, law enforcement, etc).

Features Implemented:

The current version of the interface contains most of the user interface views that will be available for the final product. The majority of the remaining tasks are related to the integration with the TeamAware platform. The most important features developed so far are:

- A map centered on the FR using a special symbology standard to represent other FRs and open standard icons to represent dangers on the field such as fires, chemical hazards, explosions, gunshots, building instability, etc.
- A system for displaying new alerts consisting of a status bar to keep track of the new alerts in a summarized view, a "hand menu" to browse through the received alerts and a details panel to view detailed information on a specific alert.
- Overlayed AR 3D information to represent critical information, in the current version the position of other team members is shown in AR 3D space once they start getting far from the FR. Additionally, dangerous areas can also be represented in AR 3D space.

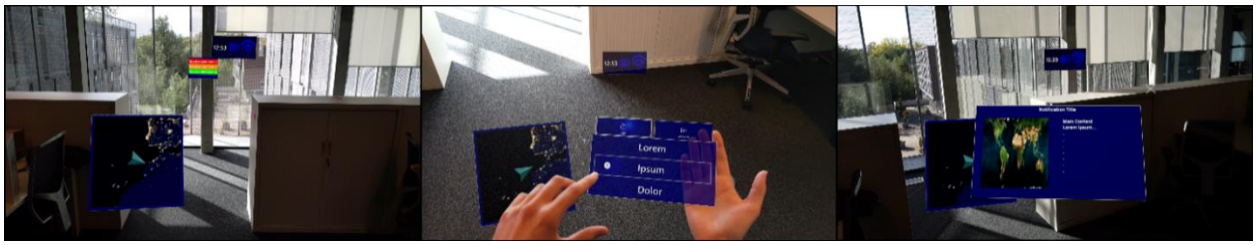


Figure 15: Currently developed views

During the midterm demonstration, the end users had the opportunity to try the application after a short informal training. All participants ended up being able to complete all the functions implemented in the current version. For the final version, we will prepare a complete training manual putting special emphasis on the functionalities that were more challenging to the end users such as closing menus, using both hands, etc.

Figure 16: End users trying the application during the midterm demonstration

With the feedback received in the Midterm demonstration we will further refine the UI design to better suit the first responders deployed in the field.

10.2.4 The TeamAware Situational Awareness Platform – Common First Responder Situational Awareness Picture

Victoria Heusinger-Heß, Jakob Stigler – Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI

Jan 23, 2023 | Blogs

One of the major systems within the TeamAware project is the Common Situational Awareness Platform (CSAP). The CSAP system is the primary interface between the TeamAware ecosystem and the First responders on the tactical and strategical level, in opposition to the mobile and AR interfaces for the individual first responders which act as “boots on the ground”. The CSAP has to provide all available information to the first responder in order to coordinate their actions and provide ongoing situational awareness and support decision making on the coordinating levels.

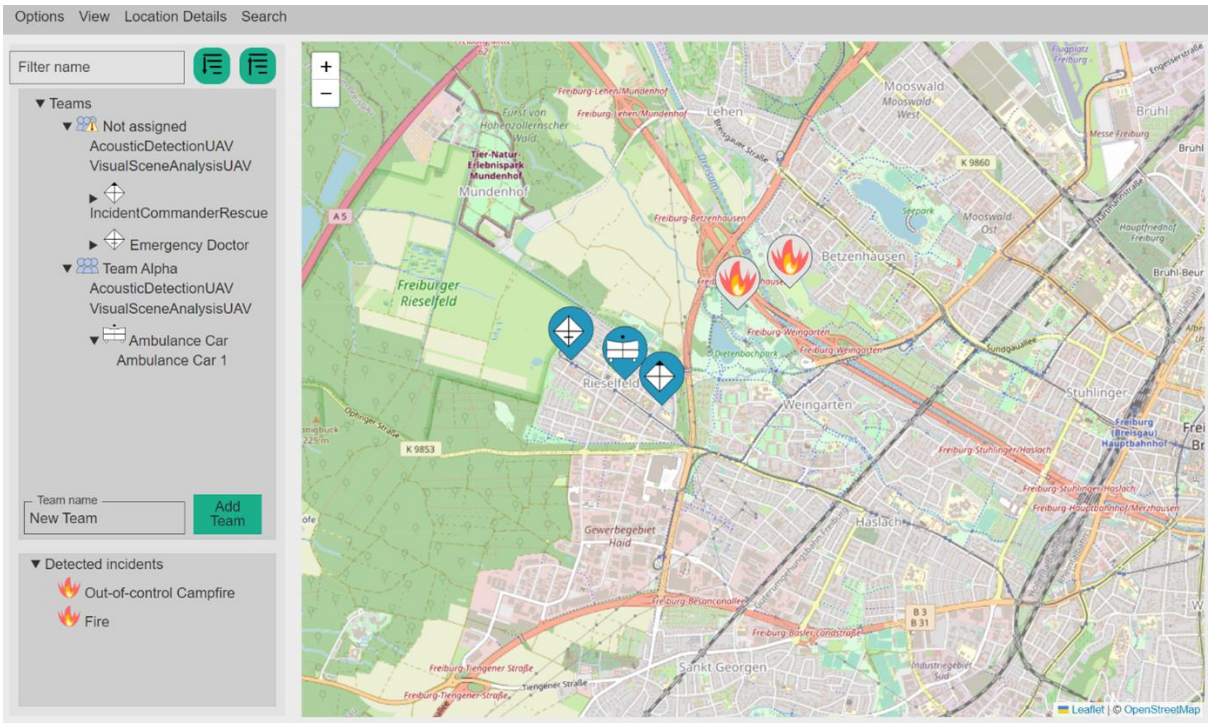


Figure 17: Overview of the CSAP web application in its current iteration

For the development of the CSAP system and especially the actual front-end module, the following key guiding principles were identified:

- Technical Usability: The CSAP system should have minimal requirements to the technical infrastructure to make an integration into existing systems as simple as possible
- HMI Usability: The Front-End should be easy to use for the operator, employ as many standard HMI procedures as possible and be as language agnostic as possible
- Readability: The CSAP system should always show all the information needed but as little as possible
- Adaptability: The operator should be able to adapt the system to their liking in terms of what information they get presented directly and which is not directly visible

Figure 17 shows the overview page of the current CSAP version. To provide a device and system agnostic front-end for the CSAP, this system is realized as a dynamic web page with the back-end and data being deployed within the TeamAware ecosystem itself. This allows the operator to use any device capable of a network connection to the TeamAware ecosystem and able to display a web page to use the CSAP system in the most flexible way possible, be it from a mobile command post with relatively big hardware, over a laptop setup impromptu in the area of a developing situation to a tablet computer or handheld device. While technically possible it is advised to not use devices with small screens (like mobile phones) if possible, due to very limited screen space and handling problems.

To make the CSAP system as accessible as possible and keeping in mind the projects nature with many international partners, it is an ongoing effort to make the user experience as intuitive as possible while on the same time limiting the need for written text. In a high pressure situation, written text is not the optimal way to convey simple information in a fast and intuitive way to an international audience. Wherever possible it is tried to employ international icons, common and intuitive signage and easy to

understand information display to make the CSAP system usable by as many people and institutions as possible and the usability of the system easy and intuitive.

To accommodate this fact, the CSAP front-end is designed to hide any information which is not deemed necessary by the system and only show that information which are considered important. Ultimately the end-users and first responders are the key personnel with the most experience in their field and the CSAP system (as the whole TeamAware ecosystem) is there to support them in their job, not make it harder. At all times, all the information is accessible through the CSAP front-end, even if it is not prominently displayed currently on the main overview screen. Also, the operator is able to manually overwrite the system decisions of which information to show and which to hide dynamically. This allows for high flexibility and the incorporation of additional domain knowledge and information the operator has access to which are not covered by the TeamAware ecosystem.

The CSAP system is an important part of the TeamAware ecosystem and, at least on the strategical and tactical level, the "face" of the system for the first responders in action. With the ongoing research and development actions in the TeamAware project the CSAP system will also be further evolved to accommodate changes in the technical systems and infrastructure but also to incorporate the crucial feedback from end-users and first responders to enhance their experience with the system wherever possible.

10.2.5 Mobile Interface Features Update

Dec 26, 2022 | Blogs

The project has progressed significantly since we last discussed the mobile interface in our last post entitled Mobile Interfaces, which explains the basics of this phase of the project and its components. For the First responders to get all the information they need and in turn, to send information to the Command-and-Control (C2) operators, Mobile and Augmented Reality Interfaces are essential to the team on the ground.

As responsible for the Mobile Interface (MI), Enide leads the development of a tool focused on the user experience (UX) to help first responders to access real-time information about the environment (from drone cameras, team members' health status, position, and tracking, etc) and give them all the information needed to enhance their performance at an emergency.

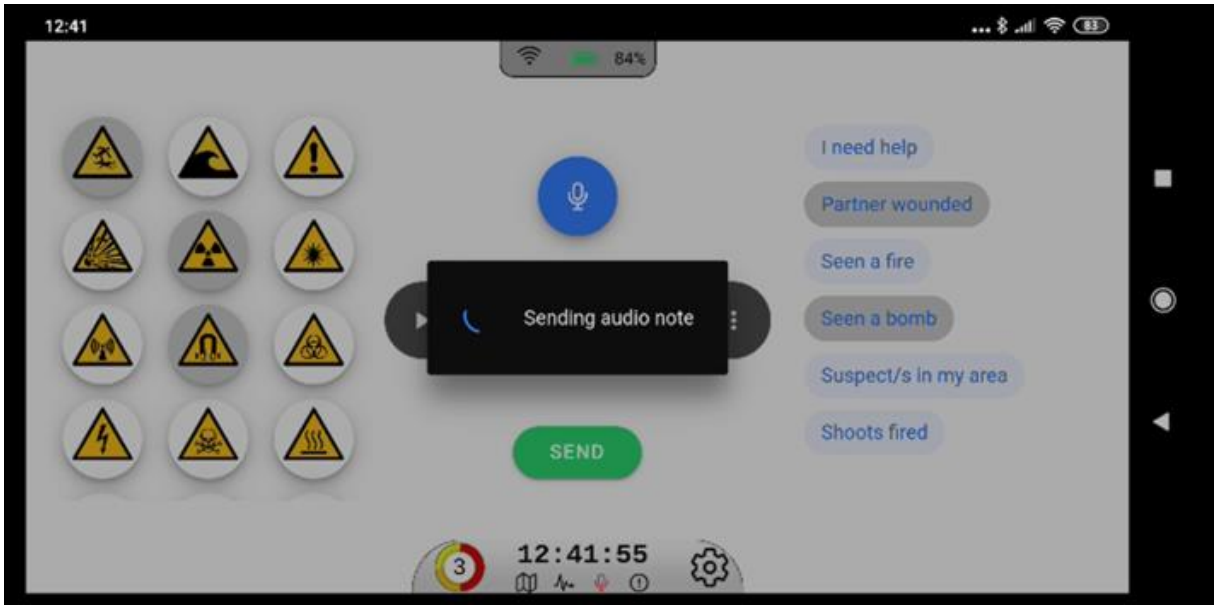
Today we want to give you an update about the development and demo phase, which was demonstrated for the first-time last November during the Mid Term Demonstration with partners in Ankara, Turkey.

MI Features:

AI platform acts as an integration layer between the sensors and the Mobile and AR interfaces. So far, the most notable features of the TeamAware Mobile Interface are:

- Login integration with SSCN (Secure and Standardised Communication Network)
- Map positioning of information extracted from the perception systems
- Sensor information listed with basic details
- Audio Notes Feature

- Icons & Operational Codes selection
- Audio Recording tool



Not only can first responders receive information, but they can interact with the control centre by sending voice notes, or by interacting in choosing specific tags according to the situation being addressed.

Mobile Interface Demo and next steps:

During the Interim Demonstration in Ankara, the partners did several demonstrations in which they tested the state of development and its functionality, its suitability, recommended adjustments to be made and discussed the challenges and next steps for the next phase of the project.

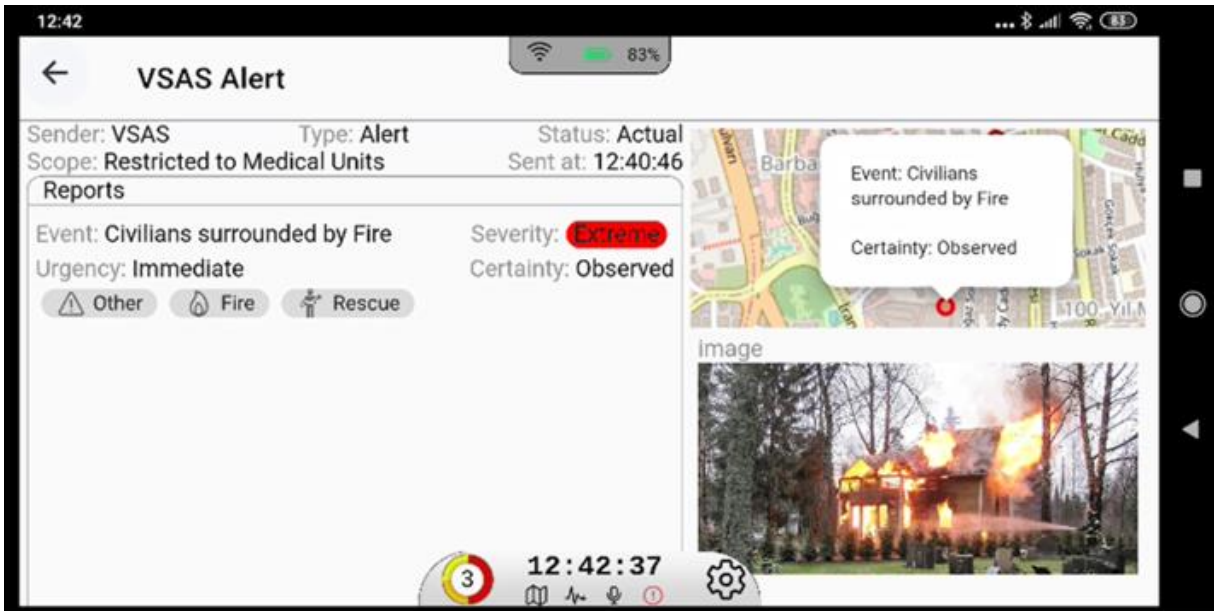


Figure 18. The display of alerts depends on the type of emergency

Enide demonstrated MI, where attendees had the possibility to download it on their mobile phones, to experience first-hand the user experience so far. Throughout the presentation, it was concluded that the biggest challenge ahead is the integration of the systems that provide the information, as it is important to prioritise it and show it to the first responders.

During integration, one of the issues to consider is the display of real-time notifications, as well as the functionality of the platform in places or situations with limited internet connection. This phase will be implemented during 2023.

David Quesada

Technical Director CTO & Co-Owner

Degree in Computer engineering. Focused on innovation for CCAM, mobility, logistics and agri-food sectors for the last 15 years, having a lead role in several R&D projects as H2020 TeamAware (Integrated and cost-efficient situational awareness system for first responders); H2020 DIGITBrain (Easy access to Digital Twins for SMEs); H2020 5G-Routes (5th Generation connected and automated mobility cross-border EU trials); H2020 INFRAMIX (Automated driving); H2020 Clusters 2.0 (Logistics); and others. Before founding ENIDE, he had lead roles in the building of complex IT systems for the Athens 2004, Torino 2006, and Beijing 2008 Olympic Games.

Ignacio López

Senior developer specialized in Python and C+

He currently works at Enide as a Software architect and Senior developer in the TeamAware, 5GRoutes and DIGITBrain projects. He began working in CTAG at 2013, developing different projects like, PSA Peugeot Citroën autonomous driving program (MobiLAB), and European smart roads/cities (SISCOGA/Co2perautos2/Compass4D). He also was part of the modernization of systems and infrastructures in Barcelona transport (T-Mobilitat) team at INDRA. Other projects that he worked on

include the development of an EV onboard charger at Ficosa for the Mercedes-Daimler group and a facial recognition application for UOC (Universidad Oberta de Barcelona)

Armand Carreras

Junior Full-Stack Developer

Credits in Computer engineering (UPC), Bootcamps in Front & BackEnd Development. Focused on HUM@N, Logicon and TeamAware Projects. Before working for ENIDE, he had worked for Linucleus as UI/UX designer.

10.2.6 The Infrastructure Monitoring System Achievements

December 14, 2022 | Blogs

The Infrastructure Monitoring System (IMS) has the objective to identify risks and threats surrounding the first responders based on the visual detection of damages on structures and infrastructures in the critical event area, using advanced Machine Learning algorithms for anomalies detection.

The automated screening algorithm for damage recognition, implemented in IMS, is a Deep Convolutional Neural Networks (DCNN) trained for item detection and localisation. Deep Neural Networks need a significant number of examples of each object class to be detected (in the order of several thousands) to be sufficiently robust. However, when the target object classes are attributable to anomalies of some kind, which, in the case of structural/infrastructural damages, may be rare, datasets of limited volume are available. Because of this reason, WP4 activities foresee the creation of a tailor-made dataset of semi-synthetic images to be used in conjunction with the dataset of real-world dataset of annotated damages available (like the one belonging to EUCENTRE). The semi-synthetic generation procedure produces images with adequately comparable characteristics to real ones, in support to the operations of training and validation of object detection algorithms.

Differently from other artificial datasets, the semi-synthetic images are created starting from 3D models of real buildings and infrastructures, as opposed to the visual rendering of CAD-based models. Starting from aerial imagery from UAV surveys, the application of the Structure for Motion (SfM) photogrammetric method allows obtaining 3D point cloud or surface models, with colours and textures as close to photographic quality as possible, provided that images have a suitable resolution for a realistic digital reconstruction. Then, the 3D models are further elaborated, and enhanced through the application of artificially generated common structural damages, according to the workflow in the following Figure.

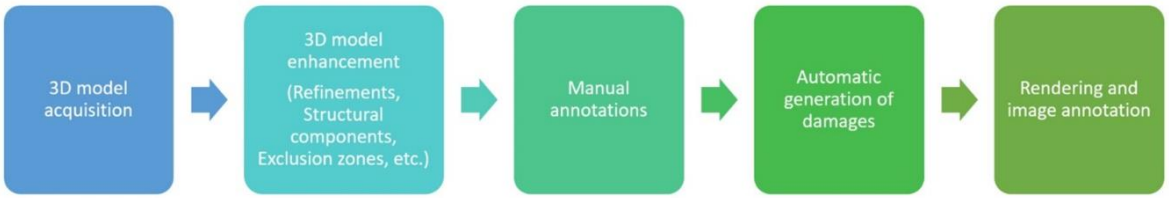


Figure 19. Workflow of the main steps of the procedure

To provide a first generalization of the dataset, some of the most common typologies of structures and technologies were selected based on their use and diffusion in urban environments, limited at present to European seismic prone countries. Depending on the architectural and structural configurations of the selected structural types, the construction details are artificially implemented in available 3D models according to typical rules of art, design codes prescriptions and examples from technical textbooks (Figure).

Figure 20. Wall section after the enhancement, where the external layer is derived by the 3D scan, while the other ones are added

The definition of the damage patterns, location and visual appearance for each of the considered structural types is based on the analysis of data retrieved from reconnaissance surveys after recent earthquakes and from experimental campaigns performed to evaluate the seismic vulnerability of both reinforced concrete and unreinforced masonry structures. After the enhancement of the model, the position in which the damages will be generated has to be specified, the “Areas of Damage” (Figure), namely the parts of the model in which the damages will occur.

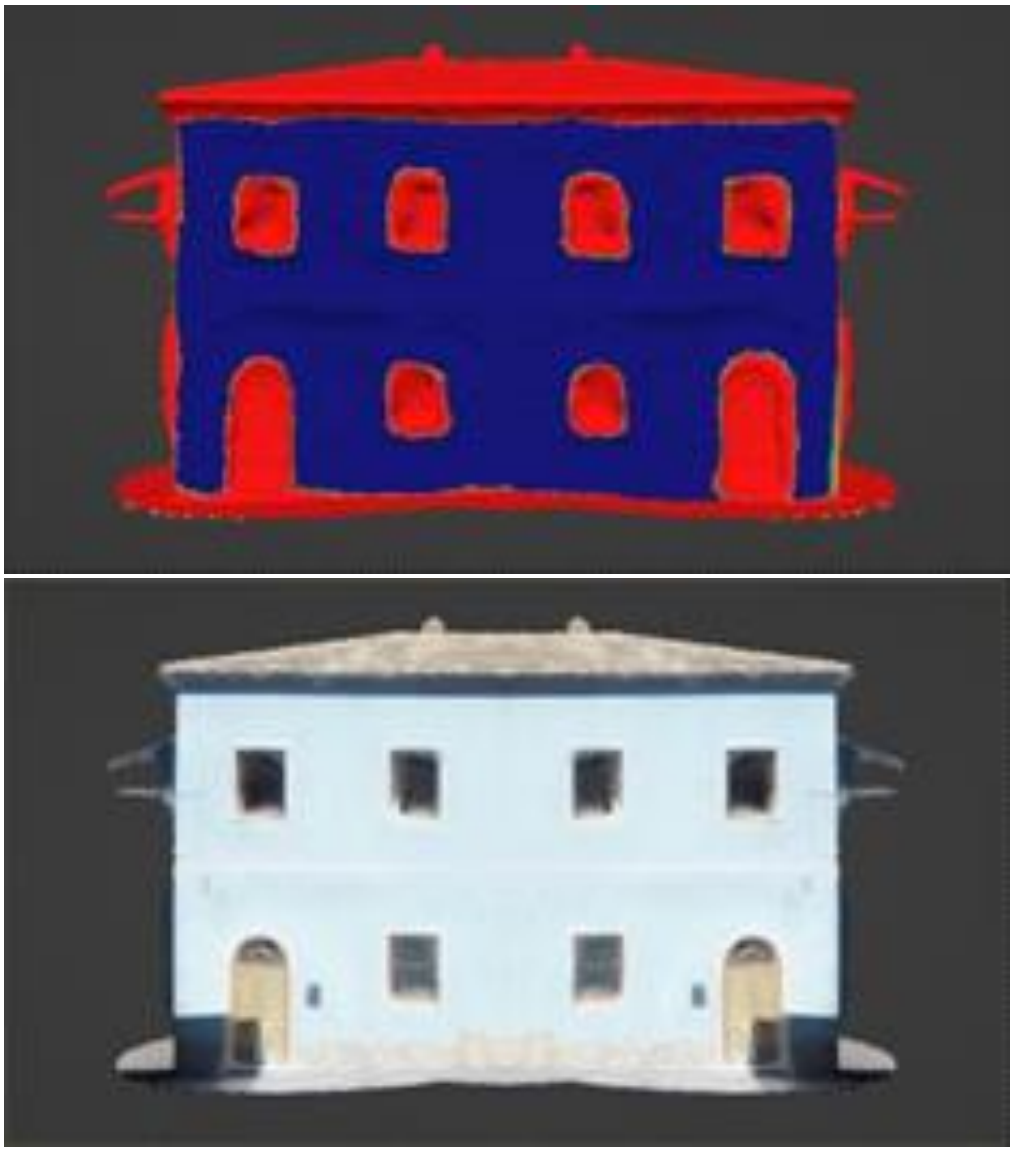


Figure 21. Selection of the Area of Damage/exclusion zones: on the left the chosen façade, on the right the map of damageable (in blue) and excluded areas

Since the goal of the methodology is to obtain a realistic simulation from not only a visual but also from a structural point of view, a manual annotation input of the models is needed from experts in the field. However, the set of annotations, from which the program can infer the remaining damage positions, is reduced to a minimum (mainly the positioning of the cracks as shown in Figure). More in general, all the damages have a high degree of parametrization, by specifying and/or randomizing their thickness, length, size, depth.

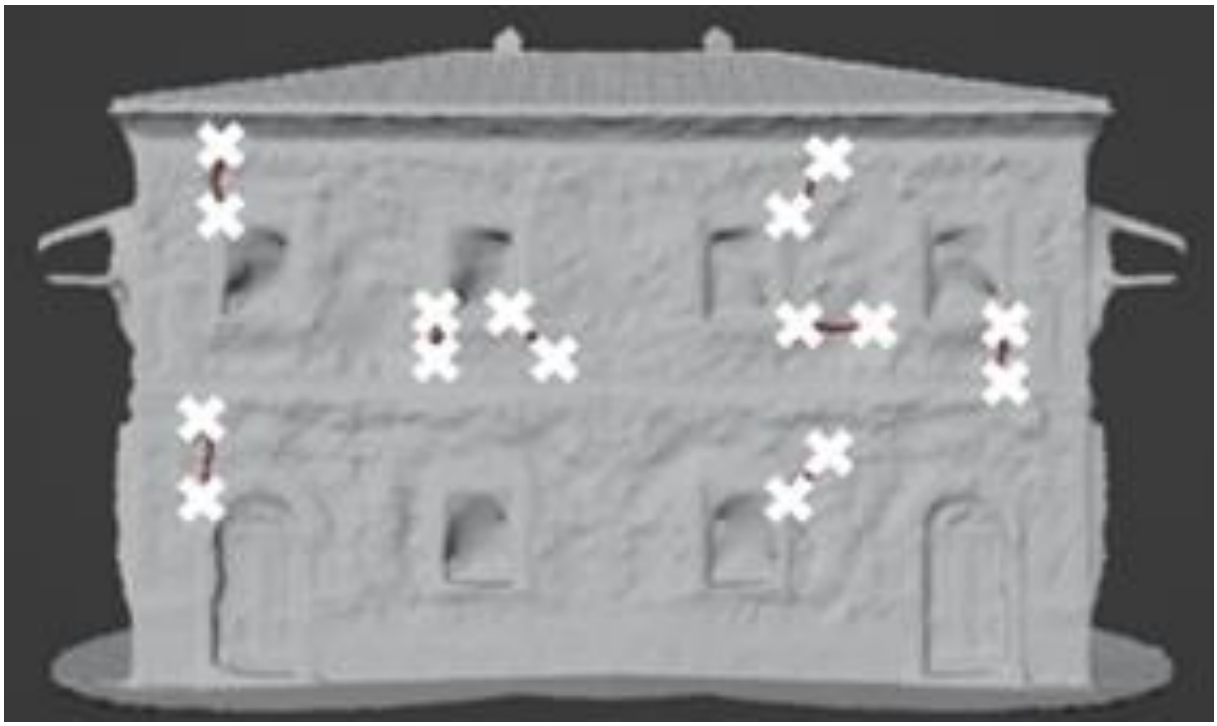


Figure 22. Examples of manual annotation: the white crosses highlight the points selected by an expert operator; the red lines are the correspondent crack paths

The last phase of the process is focused on the creation of realistic images, with bounding box annotation. During this step, the user selects the background, the position and intensity of the lights, the initial camera angle and position, as well as the path(s) that the camera will follow during the rendering, to emulate the flight path(s) of an inspection drone. Given this setup, the program can now render all the images requested. After rendering, a python script is used to add, at each image, a bounding box around each damage and to create a corresponding xml file in Pascal VOC format, a commonly adopted annotation format for object detection.

Figure 23. Some examples of the final rendering with bounding boxes (different colours mark different type of damages)

The dataset of semi-synthetic images created according to this procedure will then be used for training and testing of the damage detection algorithms implemented in IMS.

10.2.7 VSAS – THALES Blog

November 17, 2022 | Blogs

The main objective of VSAS is to develop a real-time situational awareness system for first responders based on heterogeneous information sources and sensors in an unknown environment starting from the E/O sensors mounted on a drone and on a Helmet.

To address the project scenarios, we are working on a localisation embedded functionalities:

- On The Helmet for localisation purposes is mandatory in a GNSS-denied environment. The solution that we are integrated allows to:
    - localise the First Responder, in particular in indoor environment
    - to guide First Responder to come out from a building
    - to allow a rescue team to join that First Responder

Currently we are working on the integration of the localisation algorithm in the helmet. The figure below shows the Status of the integration.

The Helmet on the figure embeds:

- an SD camera and an inertial measurement unit to acquire the required data;
- a microcontroller ensuring the synchronization of the sensors;
- an embedded computer unit on which the algorithms will be executed (NVidia Jetson TX2);

The localisation solution proposed on the helmet is based on a visuo-inertial solution (VIO), combining inertial data and visual data, thanks to a well-suited fusion algorithm. The localisation solution is an odometry solution that estimate the movement, i.e. the pose (position and orientation) of the subsystem. This kind of solution remains subject to drift. To cancel this drift, it is required to get from time-to-time absolute positions provided by a GNSS sensor when available.

- On the Drone: an UAV piloting assistance solution, in order to support a non-expert UAV pilot to navigate within unknown and complex indoor environments, the indoor UAV will be equipped with an E/O system with a RGB-D camera and Time-of-Flight ranging sensors, called

VCSELs. Specific algorithms will process data coming from the sensors and will prevent the UAV from colliding with the obstacles. Due to stock unavailability on a small indoor drone, Thales worked on the integration of the drone platform. The figure below shows the current status of platform.

Beside to this unforecasted work that Thales absorbed, the engineers worked on a simulation tool based on ROS to simulate the UAV pilot assistance solution based on VCSEL Lidars. Different configurations were studied. The current VCSEL configuration (based on 8 VCSELs) will be tested in the following month in a laboratory framework. This configuration is currently and assembled into a special PCB we developed internally that is shown below.

10.2.8 Capabilities of the Chemical Detection System

October 31, 2022 | Blogs

Within the scope of the TeamAware Project, which aims at developing an integrated and cost-efficient situational awareness system for first responders from different sectors, an assessment of the gap analysis developed in “The International Forum to Advance First Responder Innovation (IFAFRI)” was carried out.

The analysis synopsis published by IFAFRI identified several capability gaps, among which the following two can be found:

- Capability Gap 2: The ability to detect, monitor and analyse passive and active threats and hazards at incident scenes in real time.
- Capability Gap 3: The ability to rapidly identify hazardous agents and contaminants.

These two gaps will be tackled in the WP5 of the TeamAware Project, focused on the development of a Chemical Detection System (CDS), aiming at providing a wearable tool capable of analysing, detecting and recognizing the hazardous agents surrounding the first responders.

The process of developing the Chemical Detection System will have into account some important topics, such as the identification of the most relevant gases associated with the crisis management field and the most suitable technologies to measure them; the appropriate design to achieve an accuracy above 90% at a distance of 10-20 meters; the development of a predictive dispersion model of chemicals within a 100-meters radius area; and the implementation of a decision support function capable of providing additional information related to the nature and relevance of the risk, on the basis of the symptoms shown by the victims of the incident, aiming at achieving an accuracy above 90%.

With regards to the selection of the target compounds to be considered by the Chemical Detection System, different typologies of chemicals have been evaluated, such as toxic industrial gases, flammable organic gases, vapours coming from concealed explosives, Chemical Warfare Agents (CWAs), human presence markers, etc.

In relation to the predictive dispersion model of gases, different algorithms have been taken into account when modelling the dispersion process experienced by chemicals. The developed models will receive information coming from the measurement solutions, once the system is deployed in the field.

The design of the architecture of the Chemical Detection System will include the definition of the most appropriate sensors associated with the previously identified target compounds, and the assessment of the most suitable and advanced technologies to integrate those sensors into a textile substrate.

Once the design and production of the Chemical Detection System is completed, a battery of tests will be carried out in order to validate the proper functioning and reliability of the developed system.

10.2.9 The ADS Achievements

October 17, 2022 | Blogs

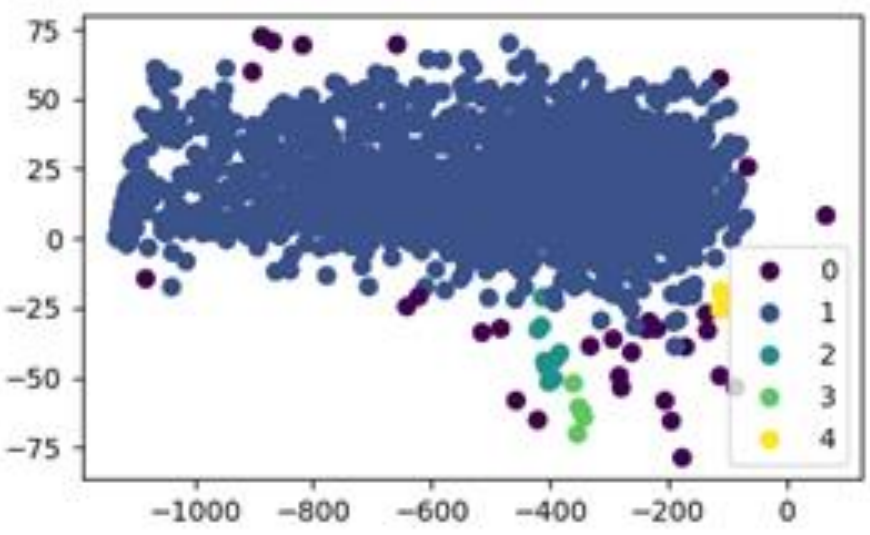
The ADS achievements can be summarized as follows:

- An acoustic vector sensor array was designed and developed for capturing audio signals
- An accurate and beneficial audio dataset was generated for the model's training
- A system able to recognize single and overlapping sound events with high accuracy was implemented
- A system that runs real-time on a Raspberry Pi 4B with the ReSpeaker Mic-Array

In more detail, public audio datasets (FSD50K, MIVIA) were collected and combined in order to shape a proper dataset for the model's training. However, the fact that some of these audio samples were weakly labeled or contained wrong labels, affected the overall model's performance. Therefore, unsupervised anomaly detection methods based on the MFCC features were applied in order to clean

the data and remove the outliers. Based on each class distribution, K-means or DBSCAN algorithm was chosen. The following figures illustrate the result of K-means algorithm on male speech and traffic noise audio samples. The ones contained in 0 cluster were removed as they were detected as outliers. The final models were trained on this dataset which was proven to increase accuracy.

K-means clustering – Male speech class



K-means clustering – Traffic noise class

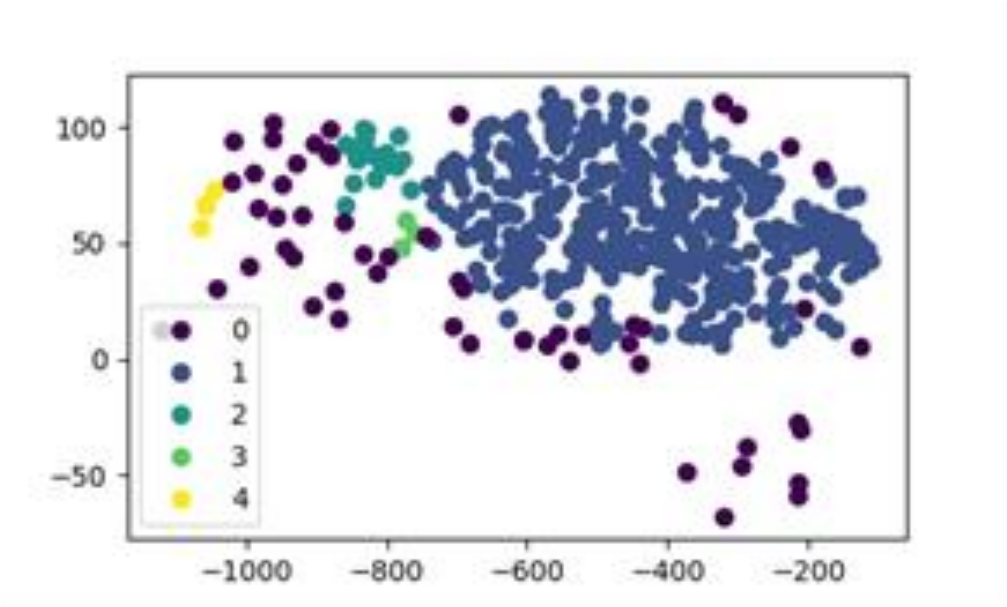


Figure 24. An example of first and second PCA for the male speech and traffic noise classes. Five clusters were created and the distance of the centroid was measured to remove outliers.

Furthermore, deep learning models were developed and trained on 11 classes for the sound event detection task. For this purpose, STFT spectrogram magnitude representations as well as mel-

spectrogram energies features were extracted. DenseNet-121 and custom 2D CNN model based on YAMNet were implemented for single and overlapping sound event detection respectively. Moreover, for the needs of the overlapping sound event detection, mixup augmentation with 30% mixture was used. The final models were optimised to run on a Raspberry Pi 4B using the ReSpeaker Mic-Array and provide detection results in real-time.

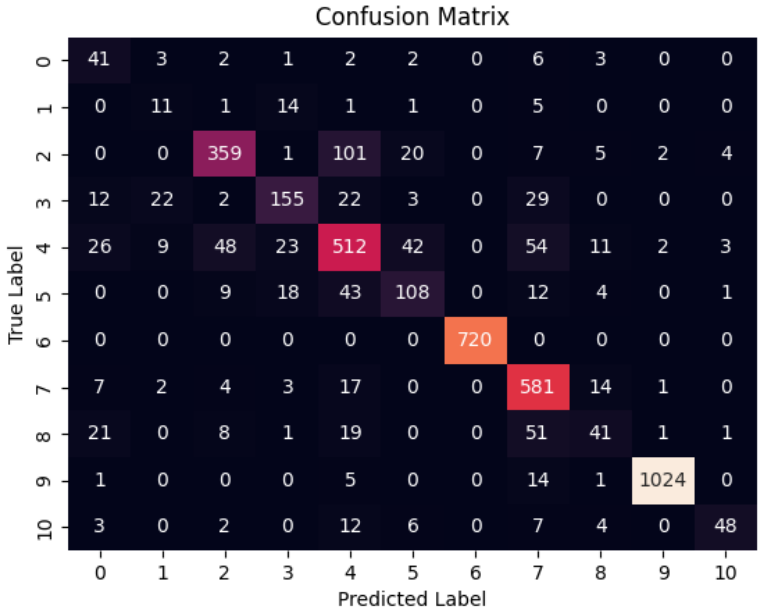


Figure 25. Confusion matrix of single event detection model. The numbers 0-10 represent the following classes: aircraft, explosion, female speech, gunshot, male speech, screaming, siren, thunder, traffic noise, UAV noise, vehicle horn.

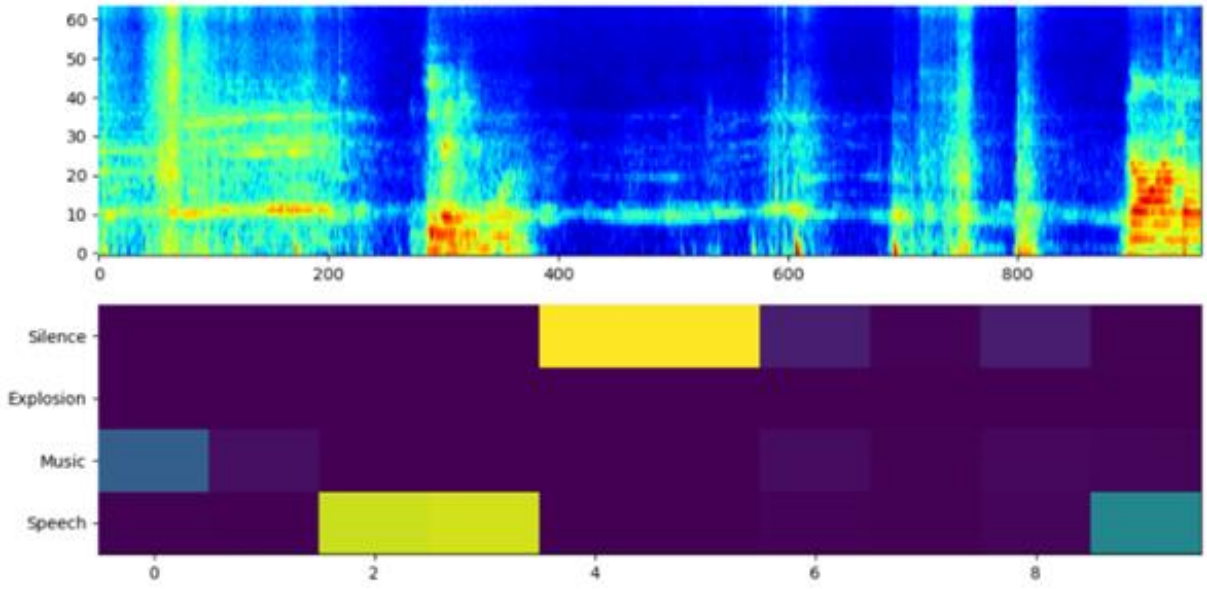


Figure 26. GUI for overlapping event detection. The top part shows the mel-spectrogram and the bottom part the target classes with a colored confidence score. The lighter it is (yellow) the more confident the system is.

10.2.10 Hellenic Society of Emergency Prehospital Care (HSEPC)

August 29, 2022 | Blogs

Hellenic Society of Emergency Prehospital Care (HSEPC, https://eeepf.gr/) was established in 2008 in Thessaloniki Greece. It is a non-profit and non-governmental scientific society, addressed to all health care workers (medical doctors, paramedics, Emergency Medical Technicians, nurses, medical volunteers) which are active in the field of Emergency Pre-Hospital Care and General Emergency Medicine in general.was established in 2008 in Thessaloniki Greece. It is a non-profit and non-governmental scientific society, addressed to all health care workers (medical doctors, paramedics, Emergency Medical Technicians, nurses, medical volunteers) which are active in the field of Emergency Pre-Hospital Care and General Emergency Medicine in general.

ΕΛΛΗΝΙΚΗ ΕΤΑΙΡΕΙΑ
ΕΠΕΙΓΟΥΣΑΣ ΠΡΟΝΟΣΟΚΟΜΕΙΑΚΗΣ
ΦΡΟΝΤΙΔΑΣ

The main objectives of HSEPC are:

Encouraging and promoting theoretical and practical education and training in the subject of emergency pre-hospital care.

To promote and improve the level of knowledge and skills of all health actors as doctors, nurses and EMTs/rescuers who are employed or are engaged in any way in the field of pre-hospital emergency care, through the organization of lectures, seminars, conferences and educational programs.

The promotion of study and research on the organization and operation of emergency prehospital care systems, prehospital resuscitation and treatment of critically ill or injured, design addressing massive casualties from natural disasters or not and accident prevention.

Promoting collaboration and exchange of scientific knowledge and information related to the subject of emergency pre-hospital care with other relevant local and international companies and institutions.

To contribute to the development of clinical standards, protocols and guidelines for the implementation of emergency pre-hospital care.

The acceptance and success of all of our events has greatly guaranteed the success of the continuation of our objectives but, above all, we are entrusted with new responsibilities to improve the quality of our programs and to attract new audiences to the creative collaboration and cooperation of all the people who give the battle in the emergency, by his position and his own abilities.

Our Clinical courses are addressed to all categories of healthcare professionals, other government officials, volunteers and citizens who are involved in any way in the initial treatment of the severely or

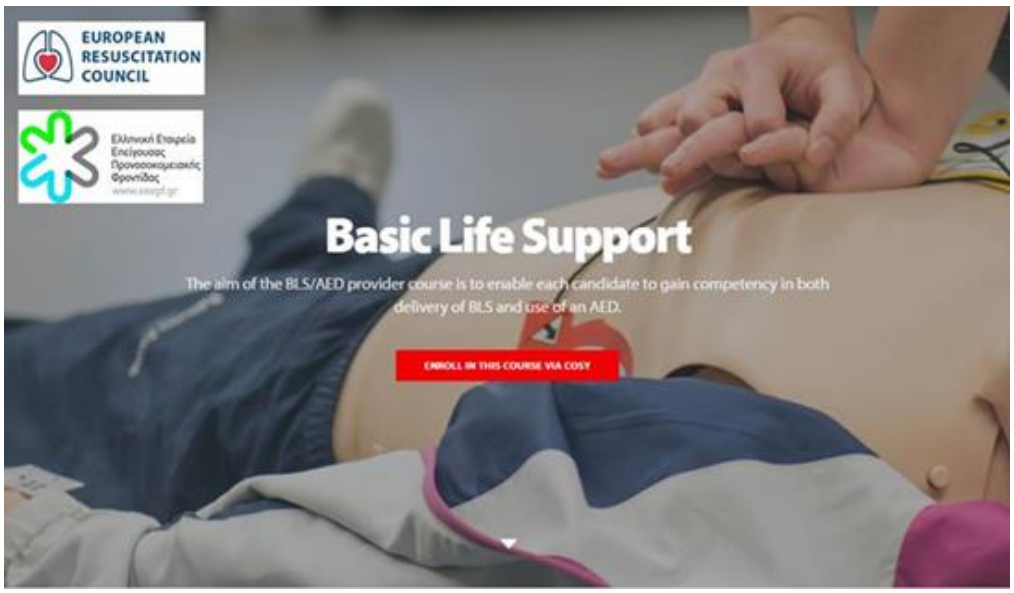
injured person at the place of the event, in the Agricultural Clinic, in the Health Center, in Emergency Rooms or in the Hospitals.

Our Clinical courses are:

- Certificated Training Courses by European Resuscitation Council (ERC).
- Certificated Training Courses by National Association of Emergency Medical Technicians (NAEMT) USA.
- Certificated Training Courses by Panhellenic Medical Association Greece.

Major Incident Emergo Train System Workshop by Centre for Teaching and Research in Disaster Medicine and Traumatology (KMC) University of Linköping Sweden.

We have organized three Panhellenic Congresses with international participation.



EU projects

IprocureSecurity, Strategic Partnership of Emergency Medical Service Practitioners for Coordination of Innovation Procurement, CSA, Horizon 2020. https://project.iprocuresecurity.eu/

HSEPC Role within TeamAware

HSEPC will be involved in this project as a medical first responder team

10.2.11 JOAFG – Johanniter Österreich Ausbildung und Forschung gem. GmbH

Aug 15, 2022 | Blogs

Johanniter Österreich Ausbildung und Forschung gemeinnützige GmbH (JOAFG, https://www.johanniter.at/angebote/forschung/) is part of Johanniter-Unfall-Hilfe in Austria and aims to provide health related knowledge to the broad public (e.g. first aid lectures), as well as training and education to medical professionals in care and emergency medical services. In numbers, JOAFG is providing first aid training to roughly 11.000 people and is educating up to 150 paramedics and emergency medical technicians per annum. Since a few years, JOAFG is working on VR training for first responders in order to increase efficiency of education and training of its staff, so they master crisis situations equally well as daily routines.

Since 2012, JOAFG is active in research projects from regional to international level, with special focus on Health Research and Security Research. The academic team competences includes communication and social science, socio-economics, public health, nursing sciences, gender studies, behavioral biology and risk management. The researchers at Johanniter have a strong focus on methodology and applied science for health, mission tactics, FR equipment and strategical development of situations. Within the last 7 years from personal protective equipment up to C4C systems were co-designed and tested in several settings from basic usability testing up to large scale exercises for testing concepts and products between TRL 4 to TRL 9.

Our main research topics in Health Research are:

- Care and care processes
- Innovative technology development (e.g. AAL, care management systems)
- Impact of health interventions on age-related decline
- Pandemic management

Our main research topics in Security Research are:

- Disaster Relief and Management
- Safety and equipment
- Evacuation
- Training and education

Our expertise:

- End user involvement, field trial management, support
- Evaluation: Evaluation Designs, profound knowledge of empirical methods in the Social Sciences
- Ethics: e.g. MEESTAR, EESSR, gender and diversity aspects, data protection issues
- Development of trainings: e.g. curricula development, for different target groups
- Business modelling: e.g. Business Model Canvas

JOAFG Role within TeamAware

Within WP2 “System Architecture Specification and Design” JOAFG is involved in the legal requirements and ethical principles of TeamAware, which includes the legal assessment of the entire project and the preliminary analysis of the societal implications of the TeamAware within the scope of the identified requirements. Additionally with expertise and competences in the field of medical first responders in the operations JOAFG is heavily involved in WP13 “Demonstration and Validation“, where one of the main contributions to the project will be in the realm of defining use cases and scenarios by representing and demonstrating real operational requirements, needs, and user experiences. In TeamAware JOAFG is responsible for the WP14-lead “Dissemination, Exploitation and Communication”, which involves Dissemination and Communication Activities, Exploitation Activities and IPR Management, as well as Standardisation.

Birgit Schilcher

Birgit Schilcher is a project manager at the Johanniter Research and Innovation Centre and has a Master of Science. She joined JOAFG in April and has extensive experience in international and national project and risk management in the areas of technical planning, business integrations, divestments and environmental disasters. Within TeamAware, Birgit Schilcher is Johanniter’s project manager.

Georg Aumayr

Georg Aumayr is head of the Research and Innovation Centre of Johanniter in Austria, which he founded in 2012. He studied Communication and was EMT for several years. As representative of Johanniter Austria in the Austrian Standardisation Institute, he is working on ISO und EN. His field of activity is related to security research and health prevention. Within TeamAware, Georg Aumayr is supporting in standardization, networking and trial management.

Dr. Yvonne Prinzellner

Dr. Yvonne Prinzellner is a senior researcher focused on (e)Health- and Security-Research at the Research and Innovation Centre at Johanniter Österreich based in Vienna, Austria. She has extensive experience as a scientist with a background in Communication Sciences and Media Psychology at Universities as well as in research projects on a national and international level. Additionally, she also works as a lecturer and thesis supervisor at several Universities of Applied Sciences all across Austria. Her expertise and research interests include Health Communication, Online Communication, Gender and Sexuality Studies, ICTs as well as Digitization & Impact of Technological Innovations on society. Within TeamAware she is responsible for the WP14-lead “Dissemination, Exploitation and Communication”.

Alisa Simon

Alisa Simon is a researcher focused on (e)Health- and Security-Research at the Research and Innovation Centre at Johanniter Austria, especially within the field of Gender & Diversity. They have a master’s degree in Gender Studies and their research focuses on vulnerable groups through an intersectional lense. They worked within agendas of inclusion and gender-relevant aspects of research designs in international projects, presented at national and international academic conferences and they have experience in publishing several papers on gender and diversity. Within TeamAware Alisa supports

dissemination and communication activities, as well as the area of legal requirements and ethical principles when it comes to the system architecture design and analysis.

Armin Vogl

Armin Vogl is an internationally recognized expert in the field of integrated border management, a trained Schengen Evaluator and strategic risk analyst. He has been working in El Salvador, Kosovo, Albania and various European, African and South American countries. Armin Vogl is able to offer strategic insight into international migration, migration analysis and foresight but as well all security related aspects in the field of policing, security management, police management and others. He has profound knowledge of migration-related indicators and their interaction in the global context. Within TeamAware, Armin Vogl will focus on use case planning and standardization.

10.2.12 The Team Monitoring System

July 29, 2022 | Blogs

The Team Monitoring System in TeamAware encompasses two major developments: the Continuous Indoor Outdoor Localisation System (COILS) and the Activity Monitoring System (AMS). Both have been already introduced in TeamAware Blog here for COILS and here for the AMS.

To ease the reader's task, a brief introduction for both systems is provided first, then the new achievements are described.

Introduction to COILS:

COILS is an indoor localisation and tracking system, aiming at providing a seamless localisation of the people in GNSS-available and GPS-denied environments. It can also be augmented by ancillary wearable sensors (e.g., heart pace, carbon dioxide sensor), becoming a wearable safety system, conveying information about the location, health status and nearby environmental hazards.

COLIS is based on coin-size, lightweight, foot-mounted IMU and magnetometer sensors, linked to a pocket-size Control Unit, in charge of managing:

- the data coming from optional ancillary sensors (e.g., GNSS receiver, altimeter, heart pace),
- the communication from/to the external world (e.g. WiFi, 3G/4G, BT, Lora, radio modem).
- Working principle: the COILS System (the next figure shows a prototype) is based on:
- a small Sensor Unit (SU) to be fastened on the shoe or located inside it (red circle);
- a control unit MCU (Master Control Unit), providing power to the foot-mounted sensor, log its data and manage the external communication;
- a software on the PC (ARIANNA-MAP) to display the path on a map view in real time and implement processing refinement techniques.

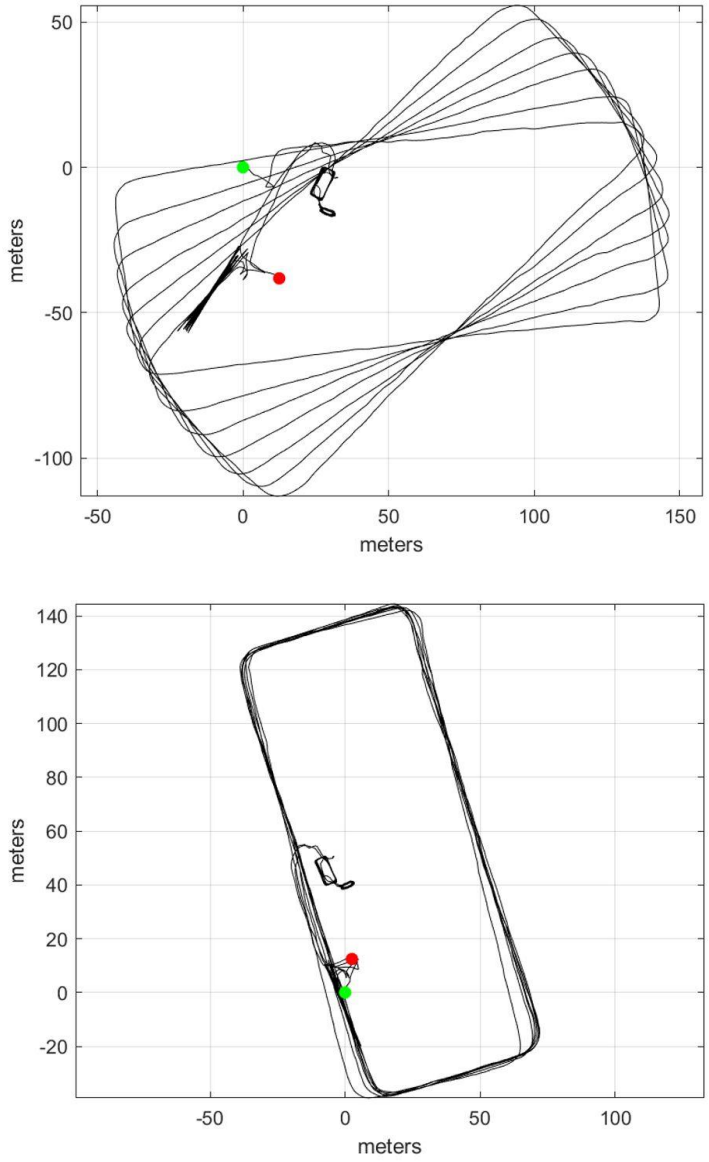
COILS Achievements:

The recent achievements have been the offspring of the research performed around two major pillars:

- geomagnetic fusion,
- GNSS-inertial fusion,

Geomagnetic Fusion:

Albeit the localisation processing implements powerful error-control and minimisation mechanisms, the low grade of the employed IMU units causes a slowly variable drift in the estimated horizontal position. Based on the information coming from a 3d magnetometer, DUNE has developed (and patented) an effective drift estimation and compensation paradigm, with low computational load, capable of providing accuracies as low as 0.5% of the walked distance. The following figure shows a 4.7 km path walked (mix of walk, run, stairs) in a dense and magnetically polluted urban environment, with and without the geomagnetic fusion introduced in TeamAware (no GNSS information has been used).



GNSS inertial fusion:

GNSS has complementary pros and cons with respect to inertial estimation. On the one hand, the pro of the GNSS is the availability of an absolute position estimate that under certain conditions can reach a few centimetres. On the other hand, the cons of the GNSS are the unavailability in indoor environments and the poor outdoor accuracy in urban environments, due to the multipath phenomenon (reflection of the satellite signal on the buildings). In a typical urban scenario, the error can reach tens of meters. In this frame, COILS must also exploit the GNSS information, taking into account that it might be fragmented, intermittent, with high HDOP (Horizontal Dilution Of Precision).

DUNE has developed a brand-new paradigm for the fusion between the GNSS fixes and the horizontal inertial position. The approach, based on a three-stages cascade problem solution, is performed at "step rate" (e.g., 1 Hz) and not at IMU sampling rate (e.g., 200 Hz). It has been on-field tested and validated in a widespread ensemble of mixed scenarios.

The next figure represents one of the results achieved in dense urban scenario (Central Railway Station in Rome, Italy), with intermittent and fragmented GNSS fixes (blue dots), largely unavailable in the

indoor part, and with highly variable HDOP in the outdoor part. The purely inertial path (red) is affected by a significant drift, jeopardising the interpretation possibilities. The GNSS-inertial fusion result (blue) has effectively removed the drift, re-establishing the path compliance with the ground truth.

Introduction to AMS:

Activity Monitoring System (AMS) is a subsystem of Team Monitoring System (TMS) which is responsible of monitoring the health and activity of the first responders. AMS will provide the classified activity data (sitting, standing, walking, kneeling, crouching etc.) of the first responders to track the physical phases of their operations by the operation centre and the other first responders in the operation field. In addition, AMS will provide the health data of the first responders in the field consisting of heart rate, body temperature, respiration rate, and blood oxygen level. AMS will also provide anomaly detection (fatigue, stress level etc.) by the implemented algorithms using the sensor data as the input.

AMS Achievements:

At first, version 1 hardware and software of the AMS motion tracking modules and gateway have been completed. Then, the first version of the motion tracking algorithms have been implemented as convolutional neural network (CNN) and recurrent neural network (RNN) based algorithms. After the benchmarking of the algorithms on a real-life dataset, CNN based classification algorithm has been chosen to classify the movements of the first responders. Due to the medium-based distortion on the magnetometer data, magnetometer calibration method has been changed into an active and adaptive calibration method and fusion of the inertial measuring units (IMUs) have been changed into a new method to provide accurate and non-drifting quaternion data. First deliverable considering the AMS design of first prototype (D7.2) has been submitted after this phase.

After the submission of the deliverable, the health sensor hub has been chosen for the integration of the health sensors, and algorithm design for the anomaly detection has been started. Health sensor hub and current AMS hardware and software integration has been started. In addition, some of the anomaly algorithms have been implemented. Integration work and meetings with network (WP9), TeamAware software platform (WP10) and TeamAware User Interface (WP11) have been conducted. Critical material for the second version of the AMS sensor hardware has been chosen.

10.2.13 Ambulance and Emergency Physicians Association (AAHD)

July 7, 2021 | Blogs

Ambulance and Emergency Physicians Association (AAHD, www.aahd.org.tr) was established in 2004 in Izmir, Turkey.

AAHD has established physicians who work in ambulances and deal with disaster medicine. All of the physicians working in this association have experience in these matters. They took part in many national and international events and developed themselves in this field. Many of them have attended international emergency and disaster medicine trainings and obtained certificates.

After its establishment, AAHD participated in international ambulance rallies and organized them in Turkey. It organized 5 international symposiums on Next Generation Technologies in Emergency

Services. AAHD physicians prepared the emergency and disaster scenarios prepared in these competitions, and served as referees and consultants in international competitions. In addition, AAHD trainers organized medical simulation and training activities (developing training materials), High Quality CPR and Advanced Life Support training (Pediatric and Adult), CRM for EMS training, “Hospital Emergency Planning Course” and “Medical Response to Disasters Course” for Hospital.

The main mission of AAHD isto support RTD and innovation activities in the fields of Disaster Response and Preparedness and Emergency Medical Services. AAHD is highly experienced in responding to medical emergencies to different kinds of disasters. Actively involved medical efforts and responded earthquakes, mine accident, CBRN incidents, terrorist attacks, major fires and mass causality incidents in Turkey.

Disaster response and preparedness; AAHD highly experienced in responding to medical emergencies to different kinds of disasters.

Most of the members actively directed medical efforts and responded to the most devastating earthquakes such as the 1999 Marmara Earthquake, 1995 Izmir Flood, 2005 Seferihisar Earthquake, 2011 Van Earthquake, 2011 Lybian Evacuation, 2014 Soma Mine Accident, 2020 Izmir Earthquake, CBRN incidents, terrorist attacks, major fires and mass causality incidents in mainly in Izmir and Turkey. AAHD members made major contributions to the Turkish EMS and Disaster Medical Response regulations. AAHD provides the scientific evaluation of the call centre, call numbers and organisational structure, the personnel function descriptions, standards and international procedures to be applied, so as to improve the work and organisation of emergency health care and disaster medicine services.

- https://www.linkedin.com/company/53489106/admin/
- https://www.facebook.com/aahdorgtr

EU Projects:

AAHD mainly contributed to research part; creating end user requirements, key performance indicators, reference scenarios, training material; demonstration and pilot testing activities of 7th FP / H2020 collaborative and RIA projects.

- BESECU, HUMAN BEHAVIOUR IN CRISIS SITUATIONS, A cross-cultural investigation in order to tailor security-related communication, Security / Collaborative Project, FP7
- BECAN, BALKAN EPIDEMIOLOGICAL STUDY ON CHILD ABUSE AND NEGLECT, Health/Collaborative Project, FP7 https://cordis.europa.eu/project/rcn/192050/factsheet/en
- SOTERIA, ONLINE AND MOBİLE COMMUNICATIONS FOR EMERGENCIES, The impact of social media in emergencies, Security, RIA, FP7
- NEXES, NEXT GENERATION EMERGENCY SERVICES, Communication technologies and interoperability RIA, Horizon 2020, http://nexes.eu/
- CRM4EMS, CREW RESOURCE MANAGEMENT FOR EMERGENCY MEDICAL SERVICES, Erasmus + KA2 Strategic Partnership. https://www.crm4ems.com/
- IprocureSecurity, Strategic Partnership of Emergency Medical Service Practitioners for Coordination of Innovation Procurement, CSA, Horizon 2020. https://project.iprocuresecurity.eu/
- ASSISTANCE, Adapted Situation Awareness Tools and Tailored Training Scenarios for Increasing Capabilities and Enhancing the Protection of First Responders, RIA, Horizon 2020 https://assistance-project.eu/
- IprocureSecurity-PCP, Pre-Commercial Procurement of Innovative Triage Management Systems Strengthening Resilience and Interoperability of EMS, PCP, Horizon 2020 https://pcp.iprocuresecurity.eu/
- SMS4EMS, The Safety Management Systems training for Emergency Medical Services (SMS4EMS) is an Erasmus+ KA2 Strategic Partnership https://www.tcd.ie/cihs/projects/sms4ems.php

AAHD Role within TeamAware:

AAHD will be involved in this project as a medical first responder team. AAHD will also take part as a medical first responder team in the TeamAware project, with its experience in EU projects it has participated in before. It will be included in the scenario and scenario definitions to be used by the medical first responders in the operations. It will also take an active role in the presentation where real operational requirements, needs, usage scenario and user experiences are presented.

AAHD has a role in publication and dissemination activities of the TeamAware Project as well.

10.2.14 Infrastructure Monitoring System Achievements

July 4, 2022 | Blogs

The activities of WP4 are focused on the development of the Infrastructure Monitoring System (IMS), with the objective to identify risks and threats surrounding the first responders based on the visual detection of damages on structures and infrastructures in the critical event area, using advanced Machine Learning algorithms for anomalies detection.

Thanks to drone surveillance of buildings and infrastructures, IMS will support expert engineers in the identification of structural damages on video footage to contribute to the emergency management

system, providing information on the typology of damages detected and annotation of their location on significant video frames in order to identify potential situations of risks during emergency operations.

The most common scenarios faced by the first responders after natural catastrophes, such as earthquakes and landslides, have been studied to carried out a proper selection of the damage typologies to be detected by the IMS. Moreover, the WP4 activities have been focused on the first design of the IMS architecture, to provide insight about the technical specification of the system components, of the functionalities to implement and the integration of the IMS with the global TeamAware architecture and infrastructure. The user needs and the overall platform requirements have been analysed in order to meet current and future needs considering the inputs of the experts of the consortium.

Regarding the deep learning algorithms to be implemented in the system, the most recent advances in the state of the art have been analysed to select the most suitable software architecture for automated damage detection. Furthermore, because the algorithms require a significant amount of data for training and validation, the availability of suitable open-source datasets has been explored, in conjunction with the development of a methodology for the generation of a dataset of semi-synthetic images for the purposes of WP4. The latter dataset is created starting from 3D point cloud and mesh models of real buildings and infrastructures obtained with photogrammetric techniques from drones surveys and it will be used for algorithm training and validation together with the EUCENTRE's dataset of annotated damages already available.

10.2.15 Situational Awareness Platform – Part 2: Data Fusion

Victoria Heusinger-Heß, Jakob Stigler, Katharina Ross – Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI, Michael Hubner – AIT Austrian Institute of Technology – Center for Digital Safety & Security

June 23, 2022 | Blogs

The overall TeamAware system is a complex aggregation of a wide array of different sensor systems coupled with individual software components which filter, interpret and digest the raw sensor data in different forms. These individual components are being acutely developed during the course of this project to achieve the final project result of a comprehensive situational awareness picture.

The TeamAware data fusion work package aims to achieve the main project goal of providing the practitioners with a high amount of leverageable information to enhance their in-situ capabilities without hindering their performance through information overflow.

In particular, the data fusion capabilities involve the alignment of the different data delivered by the individual sensor systems, like optical or acoustic sensors, to gain additional information which cannot be obtained by individual systems alone.

The goal is to decrease false alarms by combining different data sources as well as to increase measurement precision to metadata interpretation.

To achieve this goal, different individual data fusion modules are being developed or further improved within the project. Some of them already have shown great promise in previous projects, such as the MuFASA (Multimodal Fusion Architecture for Sensor Applications) framework from AIT.

MuFASA addresses various disciplines in terms of data fusion, such as data imperfection, data alignment/registration and data heterogeneity. In this sense, MuFASA provides data fusion modules that handle said tasks. In TeawAware, especially the GeoFusion module, which is part of MuFASA, will be further improved and developed. The core concept of the GeoFusion lies in probabilistic reasoning based on Bayesian inference of different sensor modalities.

This approach is used to provide multi-sensor fusion capabilities including data alignment and registration, i.e. coincidence in time and space. The main tasks of MuFASA are summarized as:

- Spatial-temporal coincidence of different sensor modalities
- Updating evidence of objects of interest in time
- Evidence-based fusion of various sensor modalities
- Confidence-based triggering of fused alarms
- Localization of fused alarms

To further increase the usefulness of sensor data for the practitioners, one of the main obstacles is the inherent unreliability in the reported data themselves. Each sensor measurement taken within a real environment is inherently unreliable to some degree. Different modalities, which cannot all be accommodated for, might change the sensor function or the reported measurement. For the practitioners on the other hand, it is of utmost importance to know that the reported data are as reliable as possible, because this might guide the operator's decision-making in a major way.

To address this problem for some systems, the Multi-Agent Navigation Frame Reinforcement Determination (MANFReD) module is currently under development by Fraunhofer EMI. The aim of MANFReD is to reinforce the localization data provided by TeamAware subsystems by correlating the localization data from various on-person systems based on metadata information as well as reports from personnel external sensor systems, which are available to the TeamAware system (e.g. camera information) to boost the reliability of the provided information and correct especially for systematic errors like, e.g., location drift.

The Sensor Information Density (SID) data fusion module is an example for a data fusion software currently under development for the TeamAware project. SID is a metadata fusion module, which aims to construct information on an operational level by observing the location and time of collected sensor information from any kind of sensor subsystem and correlating them with a specific modeling for the individual sensor type. This allows to construct an overview of the sensor coverage, information density and information decay over time for the in-situ operator based on live data. This allows for easy identification of areas which are currently not being observed and for getting an idea of information quality and thus aids the decision-making process by providing an interpretable view of the available information themselves.

With further development and integration of additional systems, more opportunities for further data combinations can be identified to increase the information flow to the operator and enhance the decision process of the operator and the usefulness of the system.

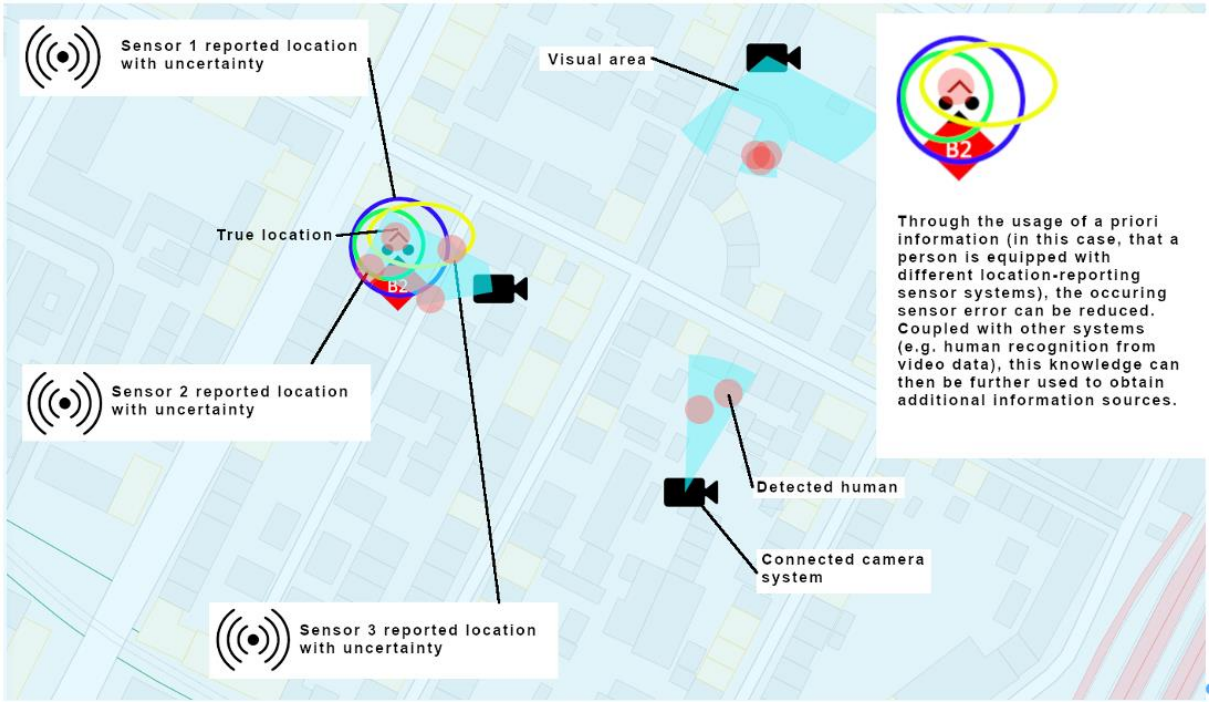


Figure 27. Mock-up of the basic principles used in the MANFReD module.

10.2.16 A great TeamAware first year for the Resilience Advisors Network and an increasing focus on the project demonstrations

June 9, 2022 | Blogs

It's been a busy TeamAware start for the RAN Team. With the project now in full flow. At the end of last year, we concluded our work helping to define and determine the system requirements and specifications based on the first responder needs, use-cases and operational scenarios. This resulted in submission of a comprehensive report investigating "Conceptual Analysis and System Requirements". The report will be published as soon as its signed-off by our Project Officer.

No time to relax after that though as we've had two key activities to oversee from the beginning of this year.

Security Arrangements:

The first has been to reinforce and operationalise the necessary Security arrangements for partners and deliverables. Many of the technologies being developed within the project are leading and cutting edge. The companies involved are understandably sensitive about their intellectual property and how it gets transmitted to a broader audience. All are fully committed to supporting the projects aims and to implementing innovative solutions so the process is supported by all partners.

We've recently appointed a new team member, Chris Singer, to lead the Security Advisory Board (SAB) and wish him luck with the work to come. He's already reviewed 12 draft deliverables and worked with our coordinators to address some small challenges so, truly a baptism of fire!

Demonstrations:

Preparation for the Interim demonstration (our Work Package 13) is well underway supported by a team introduced to the consortium last month:

Plans are now well underway for a week-long event in November in Turkey making use of the unrivalled facilities of Havelsan, Ankara. The mid-term demonstrations will focus on the individual components of project which will be tested through two days of 'tabletop demonstrations' followed by the opportunity for a small number of "integration trials" where solution providers will test their products in the developing TeamAware environment.

Tabletop demonstration are planned to be used through a test-bed type scenarios where each element will be stressed in a controlled environment to demonstrate their current state of development. The demonstration environment will reflect the conditions / scenario required to demonstrate the system requirements (for example if the component is required to work in smoke filled environments, an artificial smoke filled environment will be encountered).

Some elements of functionality and connectivity will still be under development and, as such, some technical 'workarounds' may be expected and allowed for in the demonstrations.

The results of the mid-term demonstration and evaluation will feed back into the development of the component solutions. Based on the evaluation results the solutions will be further improved, finalised and ready for the much larger and comprehensive final demonstration and evaluation towards the end of the project.

We're now working hard on first drafts of the demonstration plans, training handbooks and the evaluation process which form a separate set of deliverables later this year. At the heart of this of

course are the needs and opinions of the end-user group which covers disciplines across fire & rescue, emergency medical and policing and security. A tough but vital group of stakeholders!

Just to conclude, we're immensely grateful for the support of the technical coordinator, Çağlar Akman and his team at HAVELSAN as well as the project coordinator, Carmen Oana and her team from SIMAVI. TeamAware is a highly complex project with many technical, user and research stakeholders, all from very diverse backgrounds. The project performing as a single team in the cohesive manner it currently is, is largely down to their vision and hard work.

10.2.17 Microflown AVISA: General Objectives of WP6

May 31, 2022 | Blogs

The general objectives of Work Package 6 are:

- design of a wearable (compact and lightweight) georeferenced drone equipped with an acoustic sensor;
- detection and localisation of gunshots, explosions, in the range of 200 m with the localisation accuracy of 10 meter and direction accuracy within ±5 degrees;
- detection and localisation people whistling, and human speech in the range of 50 meter, with the localisation accuracy of 10 meters.

Above mentioned objectives will be achieved by Microflown AVISA with developing the acoustic vector sensor array and CERTH/ITI with developing algorithms, for the detection and localisation of emergency events such as explosions, gunshots and snipers, as well as human voices (e.g., screams asking for help) and whistling in the operations.

The first version of the design of the acoustic event detection system including the role of the ADS in the demonstration scenarios and the communication protocols with the TeamAware platform were determined in D6.1.

- The concept of acoustic vector sensor, the way it works and the measurements it provides were explained. Examples of acoustic vector sensors produced by AVISA and some arrays of such sensors were discussed.

The new UAV-mountable array that is to be developed for TeamAware project and the steps to be followed for its build were explained. Besides, a literature review has been conducted and public datasets were selected as a benchmark for the developed algorithms.For the TEAMAWARE project, as an intermediate step in the ongoing developments of a new sensor node, Microflown AVISA will provide CERTH some prototypes that allow them to acquaint themselves with our sensor technology.

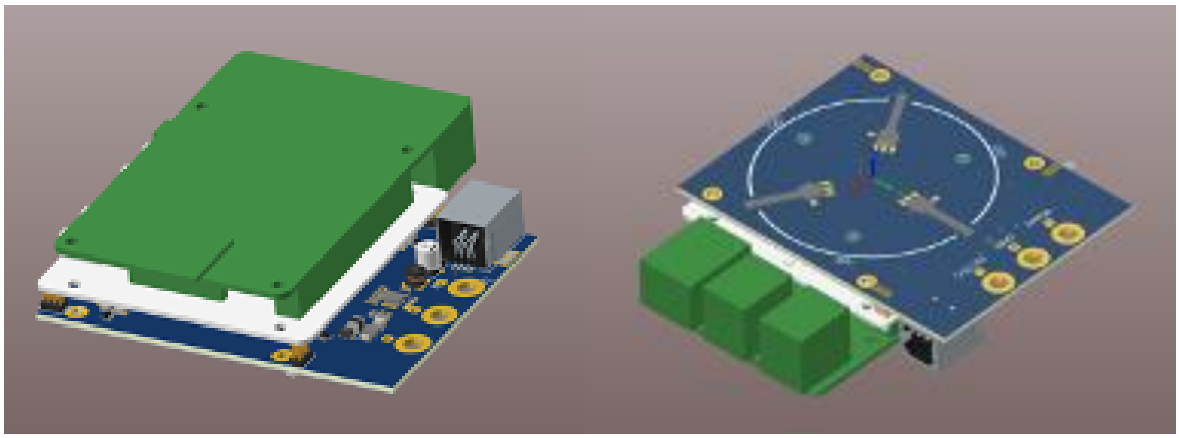


Figure 28. PCB designs of new UAV Mountable Array

The ultimate deliverable is new sensor node (dubbed AMMS 22/8) that is 23 cm in diameter, has 16 channels, a sampling rate of 48 kHz and an ethernet output.

This new sensor node will be the new platform that can handle the advanced beamforming algorithms needed for instance to handle the acoustic reflections that will occur when the sensor node is deployed on a multicopter in a tunnel test scenario.

- The details information regarding the first recording using an array of AVISA acoustic vector sensors to be used by CERTH were provided. This data recording performed by AVISA using their existing 3D-sensors. Additionally, a data collection plan to be done in the CERTH premises has been created. Deep learning algorithms for the single audio-based event detection and sound source localisation (estimating the azimuth and the elevation) tasks were implemented. The public datasets used as input to the algorithms and the necessary pre-processing steps were demonstrated. In particular, the DenseNet-121 with spectrogram magnitude representation and the DOANET algorithm with raw audio signals features were applied. Preliminary results of the aforementioned experiments were illustrated, indicating comparable outcomes to those of the state-of-the-art.

The first version of the design of the overlapping acoustic event detection system was presented as a report for D6.2.

- The current description of the overlapping algorithm will be subsequently discussed and further refined in the two upcoming iterations of the design report (D6.4 and D6.7). The relation of the particular task to the demonstration scenarios was presented and the communication protocols with the TeamAware platform were also determined in D6.1.
- Furthermore, a literature review of overlapping sound event detection methodologies using a UAV as a surveillance system was demonstrated. The FSD50K public dataset using the Scaper library of Python was used for the algorithm's training as well as the data collection plan in the CERTH premises and data provided by the AVISA acoustic vector sensor were described. The pre-processing steps and feature extraction methods were also demonstrated. In particular, the Wavegram-Logmel classifier was implemented to solve the problem of overlapping audio-based event detection. The preliminary results are encouraging for this task since high performance was achieved on unseen during training data.

10.2.18 CICIS: Connecting with Citizens During Emergency Situations

May 30, 2022 | Blogs

Engaging and involving citizens during emergencies are among the most critical activities that the work being undertaken in Work Package 8 is focusing on (please see our first blog post on CICIS for an overview over the work in the work package). In the initial phase of our development work, we are hence focusing on the development of the technical means through which we can connect with citizens during emergency situations including a mobile interacting with a dedicated server that collects data provided by citizens and that will provide information and guidance to them during emergencies.
While the system backend is based on an existing system (the Innova Participation Platform for citizen engagement), we are developing a new custom mobile app for citizens to use during emergencies that will be tailored to the unique constraints and high-stress usage environments in which the app is expected to be used by citizens.

Our work focuses both on the technical backend development and modifications needed for use of the Participation Platform in TeamAware and on the development of initial mobile app user interface prototypes that we can share with our end user partners for iterative review and improvement of the way in which citizens can be engaged during emergency situations for their protection as well as for providing useful information to first responders.

The figure below shows a few early example screens from prototype development of the mobile app being prototyped for use in TeamAware for providing information on a fire. These examples also illustrate our aim to create visual prototypes early on in order to improve the app user interface. For instance, the next iteration of the middle screen in the examples below was further simplified by replacing the slider meant for providing information on the size of a fire as it was found to be too difficult for citizens to provide such information via a slider.

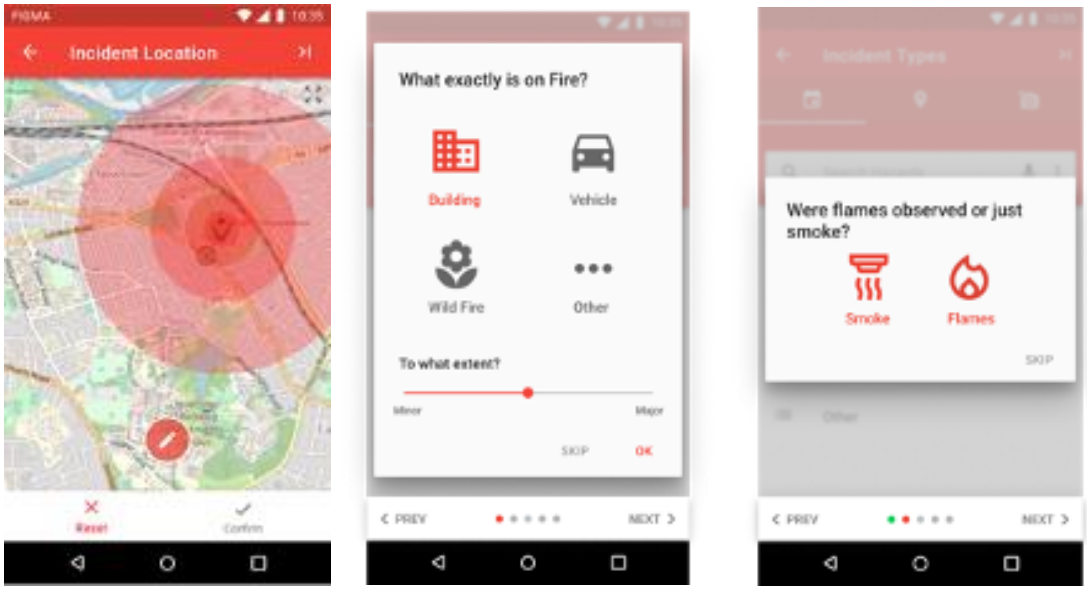


Figure 29. Example prototype app user interface elements

The development of the mobile app for citizens will continue throughout the technical development phase of the project, and the app will be tested in the field testing and validation exercises of the

project. In future blog posts, we will describe how other components developed in Work Package 8 of TeamAware will integrate with the app.

10.2.19 TeamAware Mobile and AR interfaces

May 30, 2022 | Blogs

All the information collected by the TeamAware sensors has its role to play on the system. The Command-and-Control (C2) operators can manipulate and analyze all this data in detail before taking decisions. However, the first responders (FRs) that are deployed on the field can't stop their operation to browse through all the available data.

For this reason, the Mobile and AR interfaces are critical if we want the project to add value to the deployed FRs. These interfaces must filter the data and only display the information really needed in a way that doesn't hinder the ability of the FR to do their job. That way we can enhance the decision making of the FRs without modifying their actual way of operation.

To archive this, we are following some common design principles on both applications:

- Hick's Law: keeping the options on each view reasonable will minimize the time it takes for a user to complete an action
- Aesthetic Usability Effect Law: the more pleasing to use the application is, the more the end-user feels motivated to use it
- Fitts's Law: the time to acquire a target is a function of the distance to and size of the target
- Ergonomics: Movements required for gesture interaction need to be easy to perform even on extreme and dangerous conditions

Mobile Interface:

The Mobile Interface (MI) is being built with Ionic Framework which uses Capacitor Native Plugins, to access both Android and iOS capabilities, that will deliver a multi-platform application. In addition, Angular Framework, a component-based framework for building scalable applications, is being used as development code, encapsulated inside the Ionic App.

The aim of the MI is to deliver real-time information to the FRs in any situation without introducing additional stress on their operations. So, the FRs should be mostly hands-free to be able to perform their activities efficiently. Therefore, the main goal of the MI is to provide the necessary information for the operation in each step although it will also provide a direct communication channel between the C2 and the FRs.

Also following this approach, the map will handle the main interaction with the FRs, displaying several types of alerts, FR location and sensors. This is an easy and fast way to make the FRs aware of what is currently surrounding them.

Moreover, to bring more details to the end users, the MI provides a view which allows to navigate through all FRs or sensors and check its current state. In the case of the sensors, there will be a vast

variety of parameters that will display dynamically depending on their danger levels, easing then the readability.

Similarly, the "Alerts View" will provide a list of alerts sorted by danger levels, that can be clicked on for more information.

Finally, the "Audio Notes View" will support communications from the FRs to the C2. This feature allows them to send an audio note and information such as Geo position, health status, hazard conditions, and some predefined alert descriptions. Once this information is sent, the C2 should analyze it and raise the proper alert.

AR Interfaces:

We'll begin exploring the different approaches to AR technology and some examples of the types of applications that can be built with each one. After that we'll analyze how we plan to work together with the end users to design our interface.

Mobile AR:

This approach uses the camera of a mobile device and displays the augmented reality scene in the screen of the device. On this technology the real world and the virtual world are mixed and can interact, but all is displayed in a flat 2D view. It's the most common and approachable way of AR technology but it has its limitations. The main disadvantages are:

- It's not very immersive because you are looking at a screen (2D)
- Mobile devices sensors and processing power are limited and not designed to work specifically for AR applications
- Using mobile devices for AR still looks odd (an issue that we have with most AR technology)

HUD (Heads Up Display):

It's not really an AR technology. A HUD is just a screen that shows information in 2D in front of the user. It has its applications, for example it could be useful to show navigation data to someone that is driving a vehicle, so they don't have to take their eyes off the road to see the instructions. However, it does not take the real world into account when displaying the data.

HMD (Head Mounted Display) AR:

These interfaces require a specialized device to work (HoloLens, Magic Leap…) and provide the best AR experience. They come equipped with dedicated hardware and software for AR tasks which allows them to understand the surrounding environment and present data in 3D integrated in the user's real space. The main disadvantages are:

- The AR devices are pricy and usually suited to very concrete use cases (industrial, research…)
- The AR devices are bulky and people using them may look odd (which may cause reject when proposed as a solution)
- AR technology is still in development, that means there are still limitations to overcome and that the users have to be trained to use it (unlike mobile AR that is closer to a "normal" mobile use)

Building The Interface:

On this first phase of the project, we have collected the end users' needs to prioritize what information they want to see in our application. One of the main obstacles we face when designing an AR application is that conveying how things looks and how the interaction methods work by using pictures and video is not easy.

To overcome this challenge, we have decided to make our interface as modular as possible, to allow us quick iteration. With this idea in mind, we plan to build several prototypes for the midterm demonstration so we can have the end users try different interaction methods and ways to organize the information on the screen.

Our objective is to incorporate the end users' input in all the development steps, so our final application not only complies with the technical requirements, but also is tailored to their needs.

10.2.20 CHEMICAL DETECTION SYSTEM ACHIEVEMENTS

May 23, 2022 | Blogs

WP5 is focused on the contribution to the safety of first responders and victims by detecting and monitoring dangerous substances such as chemicals or toxic gases in a Chemical Detection System (CDS).

The main outputs of this CDS will be a wearable chemical detection sensing solution and a chemical dispersion model that contribute to the decision support system. The wearable chemical sensors will monitor air quality and potential risks surrounding first responders such as hazardous gases, and flammable gases. The information provided by the wearable chemical detection solution will contribute to a dispersion model that will provide the intensity of chemics, evolution and dispersion map of these chemicals.

On the one hand, the most common situations faced by the first responders have been studied, as well as what substance or chemicals are usually found in these situations to make an adequate selection of the type of sensors to be considered. On the other hand, the definition of the set of chemical compounds the wearable system that could include to detect and monitor over the disaster area for the sake of the safety of the first responders has been defined.

During the previous period, an initial overview of the overall architecture of the CDS has been defined. Also, insights in the mechanisms functionalities and responsibilities of each part of the system have been developed. All the CDS architecture has been defined considering the definition of interfaces that connect with other systems as well as its integration with the global TeamAware architecture and infrastructure. The requirements and user needs have been analysed in order to design a product that meets current and future needs considering the inputs of the experts of the consortium.

Regarding the dispersion modelling for chemicals different models have been considered models since they are appropriated for different needs and different substances. Dispersion model responds to the need of environmental awareness in the first responder operations, based on the chemical data to be collected from the field, prediction for the future chemical dispersion will be given as an output of this deliverable to plan operations. These dispersion model using a statistical approach gives the user more

information about spatial and temporal changes in contaminated areas with controller cost of computational effort.

AITEX:

AITEX is a private non-profit association established in 1985 that encompasses textile and related companies. Its ultimate aim is to make this sector more competitive. To achieve this, the Institute promotes modernization and the introduction of new and emerging technologies and, in general, any initiatives that will contribute to the industrial progress of the sector. The work carried out by the Institute is closely linked to the sector's industries, either through the advanced technical services offered by the Institute (consultancy, market, certification, quality control, training, etc.), the confidential research projects developed at the request of different companies or the projects financed by public funding, in which case the results benefit the sector as a whole. Some current figures are that AITEX has around 1.100 associated companies, more than 3.000 clients, 250 staff and 9 delegations around the world (North and South America, China, Pakistan, Lithuania and India) apart from the headquarters in Spain.

HAVELSAN:

HAVELSAN develops indigenous and national solutions in a wide range, covering system engineering, integration, testing and training oriented at command, control, communications, information systems, intelligence, surveillance and reconnaissance requirements in strategic, tactical and operational levels in the areas of defence and security, and offers technical support services for the above. The Company turns its technology and R&D investment and core competencies into easily-adaptable new products and systems. In the scope of this work package, HAVELSAN will be responsible from chemical dispersion model for sensors which is one of the core competencies of the company.

10.2.21 Centre for Research and Technology-Hellas / Information Technologies Institute (CERTH/ITI)

May 16, 2022 | Blogs

The Centre for Research and Technology-Hellas (CERTH, www.certh.gr) is the only research centre in Northern Greece and one of the largest in the country and it was founded in 2000. It is a legal entity governed by private law with non-profit status, supervised by the General Secretariat for Research and Technology (GSRT) of the Greek Ministry of Education and Religious Affairs. CERTH has important scientific and technological achievements in many areas including: Energy, Environment, Industry, Mechatronics, Information & Communication, Transportation & Sustainable Mobility, Health, Agro-biotechnology, Safety & Security, Cybersecurity, as well as several cross-disciplinary scientific areas.

CERTH has received numerous awards and distinctions such as the European Descartes Prize, the European Research Council (ERC) Advanced Grant, Microsoft International Contest Prize, the Trading Agents Competition Award and many more and is listed among the Top-25 of the EU's Organisations with the highest participation in H2020 competitive research grants. CERTH has participated successfully in more than 1.200 competitive research projects (involving more than 4.410 international partner organizations) financed by the European Union (EU), leading industries from USA, Japan and

Europe and the Greek Government via the General Secretariat of Research and Technology (GSRT). More specifically, CERTH has been involved in 613 EU funded research projects (318 H2020, 259 FP7, 14 RFCS, 1 EMFF, 3 3HP, 11 CIP, 6 EPLUS, 1 JUST) acting as Project Coordinator in 136 , beneficiary in 443 and 3rd party in 6 of them. CERTH's research results (more than 350 publications/year) have significant scientific impact (about 7.100 heterocitations/year).

The Information Technologies Institute (ITI, www.iti.gr) was founded in 1998 as a non-profit organisation under the auspices of the General Secretariat for Research and Technology of the Greek Ministry of Development, with its head office located in Thessaloniki, Greece. Since 10/03/2000, it is a founding member of the Centre for Research and Technology Hellas (CERTH) also supervised by the General Secretariat for Research and Technology (GSRT).

CERTH/ITI is one of the leading Institutions of Greece in the fields of Informatics, Telematics and Telecommunications, with long experience in numerous European and national R&D projects. It is active in a large number of research domains such as Security and Surveillance, Image and Signal Processing, Artificial Intelligence, 5G/6G Smart Networking, Computer & Cognitive Vision, Human Computer Interaction, Virtual and Augmented Reality, Multimedia, Database and Information Systems and Social Media Analysis.

CERTH/ITI has participated in more than 525 research projects and R&D contracts with the Private Sector (Industry). More specifically, it has been involved in 304 EU funded research projects (167 FP7 & 137 H2020) and in 221 projects funded by Greek National Research Programmes and Consulting Subcontracts with the industry (87 National; 8 Interreg and 126 R&D contracts). The current ITI projects consist of 116 ongoing projects (including EU and national projects, contracts and services).

For the last 10 years, the publication record of ITI includes more than 330 scientific publications in international journals, more than 780 publications in conferences and 100 books and book chapters. These works have been cited in more than 7.500 times.

Role within TeamAware:

CERTH/ITI primarily participates in WP6 ("Acoustic Detection System") with developing algorithms for the detection and localisation of emergency events such as explosions, gunshots and snipers, as well as human voices (e.g., screams asking for help) and whistling in the operations, using an acoustic vector sensor. In particular, CERTH/ITI is the Task Leader of T6.2 ("Overlapping acoustic event detection") which aims to provide recognition of overlapping acoustic events and participates in Task 6.1 ("Acoustic event analysis and detection") which focuses primarily on the design of the ADS architecture and the implementation of algorithms for Single-event detection (SED) and Task 6.3 ("System validation") which evaluates the final system in the tested environment.

Moreover, CERTH/ITI participates in WP2 ("System Architecture Specification and Design") which provides the requirements and architectural design for the ADS. This information will be the basis for the development of each of the components and algorithms in WP6. Also, WP6 will feed the platform software in WP10 ("TeamAware AI Platform Software") and will help to increase the confidence of the detected events, by performing fusion with the other modalities (T10.1). Furthermore, WP6 will also feed the user interface in WP11 ("TeamAware AR/Mobile Interfaces"). Moreover, WP6 will have an interface with communication and network infrastructure from WP9 ("Secure and Standardised

Communication Network") (T9.4). Finally, WP6 will take part in WP12 (“Integration and Test”) (T12.1) for integration, testing and in WP13 (“Demonstration and Validation”) (T13.4) for demonstration. CERTH/ITI also participates in horizontal activities of the project in WP1 (“Project Management and Coordination”) and WP14 (“Dissemination, Exploitation and Communication”).

Acoustic Detection System:

The stages of an audio-based event detection system consist of two phases: training and testing as it is illustrated in Figure.

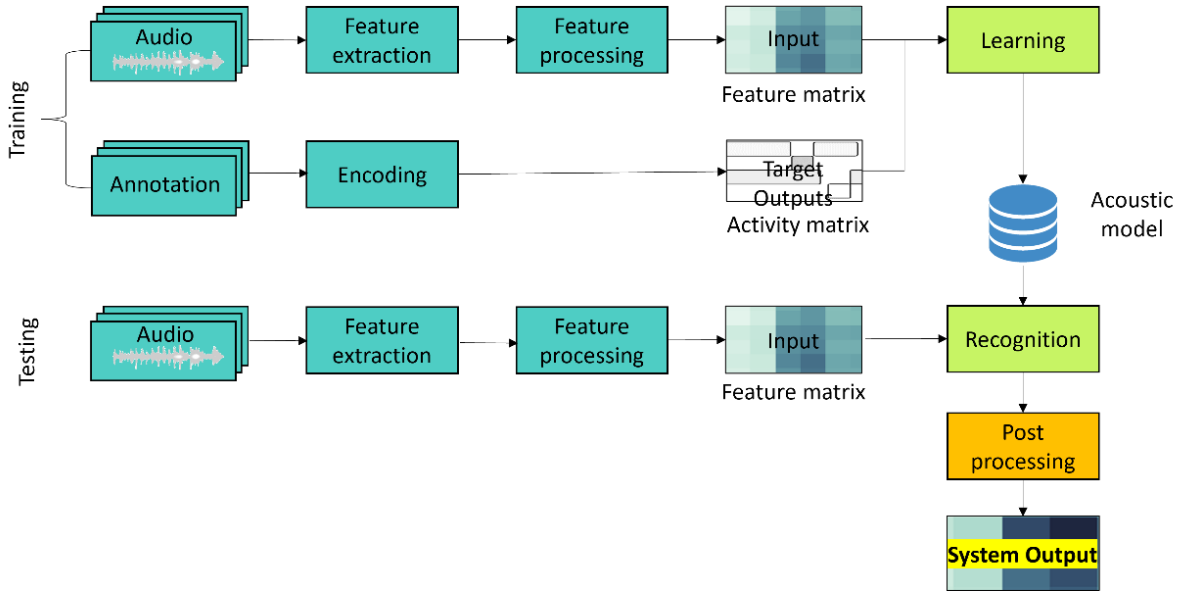


Figure 30. General architecture of a single audio-based event detection system.

During the training phase, the raw audio recording is obtained, usually in wav format, it is annotated as a string regarding the events that it contains and then it is encoded into an array of zeros and ones. Following this step, audio characteristics (also known as features) are extracted from the raw recording, they are processed, usually by normalizing them in terms of their mean and standard deviation and finally, they are stored in a two-dimensional matrix. The first dimension of this matrix (rows) is usually the number of features and the other one, the time-step at which each feature is calculated. The annotation and feature extraction complete the acoustic model that is stored in order to perform the classification.

For the acoustic model, deep learning methods can be applied such as Convolutional Neural Networks (CNNs). The classification process, from the input magnitude spectrogram representation to the final Softmax layer that outputs the probability score of each class is shown in Figure.

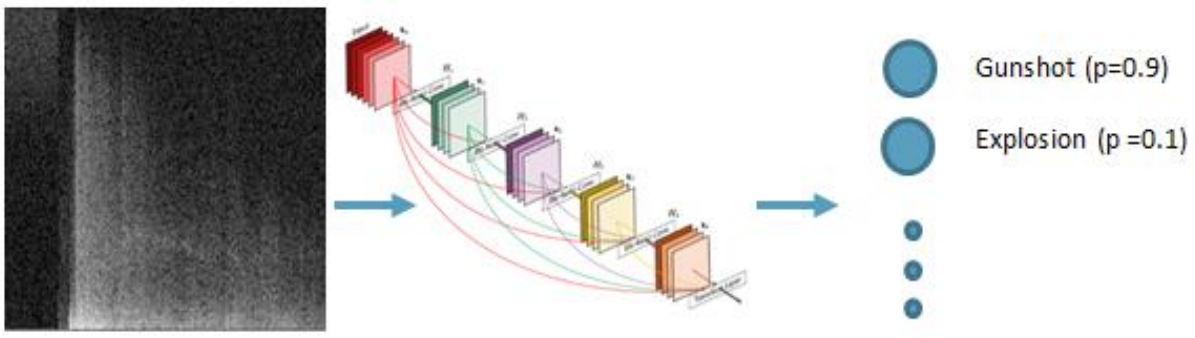


Figure 31. The classifier based on the CNN architecture.

During the testing phase, similarly, features are calculated from the raw audio recording, they are processed and stored in a two-dimensional matrix. This matrix is compared to the one created during the training to find the closest match. Finally, once the match is found the system outputs the corresponding class, related to the audio event.

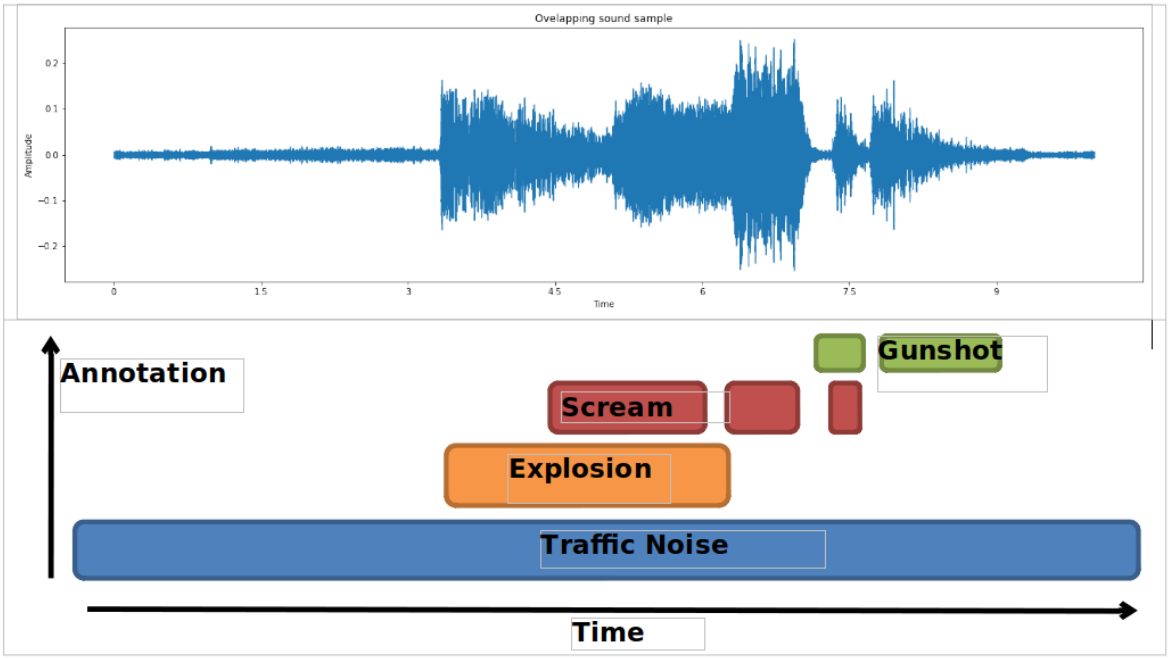


Figure 32. Output of overlapping sound event detection.

For the detection of overlapping acoustic events noise reduction and echo cancellation techniques should be applied. The stages of a sound event detection system where overlapping sound events are occurring are illustrated in Figure 3. In polyphonic sound event detection, a multi-level segmentation of the audio is provided based on the number of the targets and the temporal timestamp of the events.

10.2.22 Ethics and data privacy in emergency response

May 16, 2022 | Blogs

To manage a crisis, emergency first responders must have effective and efficient communication strategies in place as speed of information exchange is one of the main determinants of incident recovery. Failures in communication can have severe repercussions.

Similarly, the use of big data1 and machine learning2 raises the possibility of misuse and unintended repercussions. Consequently, it becomes critical to address the societal, legal, ethical, and data protection challenges that may arise as a result of their implementation. There are a few crucial considerations that must be taken into account, in particular:

- How will data be collected and used?
- What measures will be taken to mitigate risks and stay compliant?
- What are the implications of using machine learning algorithms?

That is where Eticas comes in as the project's ethics partner. Eticas Research and Innovation is a non-profit organisation dedicated to research, education, and dissemination at the nexus of technology, data, society, and responsibility. Our goal is to promote public awareness about the dangers of digital technology, while also empowering individuals and communities to preserve their personal information.

Eticas assists policymakers in developing policies that maximize technological advantages while avoiding potential negative consequences. Moreover, it helps technology developers detect ethical, legal, and social concerns early in the development process and incorporate alternatives into the technology design. The Eticas Foundation is leading cutting-edge, highly competitive projects in a variety of fields, such as building responsible data exchange systems, ethical solutions, and analyzing GDPR compliance for sensitive projects.

Key ethical issues for TeamAware:

During crisis and emergency management, the TeamAware toolkit and processes will be largely aimed toward building and improving first responder awareness, communication and knowledge management systems. These toolkits are specifically created to meet the interests and needs of first responders such as law enforcement officers, medical workers, and emergency responders. The data transfers that communication between these groups entails, however, must be especially respectful of fundamental rights to privacy and personal data protection, as stipulated in frameworks such as the European Convention on Human Rights and the Charter of Fundamental Rights of the European Union (2016/C 202/02). TeamAware toolkit users must be able to safeguard these rights in regards to the data they share with the system under these coordinates.

Furthermore, the Charter of Fundamental Rights (CFR), the European Convention on Human Rights, and the Universal Declaration of Human Rights all underline the importance of the right to non-discrimination. As a result of their characteristics, many of the potential collectives using TeamAware toolkits, including those with disabilities, may encounter discrimination. The CFR is a document that sets out the basic rights and freedoms of everyone in the European Union. These rights include

the **right to integrity, the right to privacy, and the right to protection from discrimination** on the grounds of race, sex, religion, or national origin. One of the most important rights enshrined in the charter is the right to integrity. This right protects people from being subjected to violence or intimidation, and ensures that their personal data is protected.

The Teamaware project has thoroughly examined all of the potential effects of sensitive data processing for members of the aforementioned collectives. When it comes to the protection of personal data of study participants who belong to vulnerable groups of the population, the consortium has identified non-discrimination as a major objective of TeamAware. One of the project's key goals is to provide practitioners with relevant information on how to deal with vulnerable individuals during an emergency. These recommendations will aid in avoiding any potential discriminatory treatment during the research.

Due to the general characteristics of TeamAware's live-action field exercises, **the right to integrity** is important when considering that the research participants will be exposed to conditions that may jeopardize their physical and mental well-being. Further, the **right to privacy** is a conditional right, meaning it can be broken for good reason and in a proportionate way. This is alluded to in the second paragraph of the European Convention on Human Rights. As a result, TeamAware will handle research participants' personal data proportionally and in compliance with data protection rules.

Key data protection issues for TeamAware:

The General Data Protection Regulation (GDPR) is a regulation specific to the European Union in the area of data protection. It replaces the Data Protection Directive 95/46/EC, which was introduced in 1995. The GDPR was adopted on April 14, 2018, and came into force on May 25, 2018. The GDPR regulates the handling of personal data by controllers and processors within the European Union. It also establishes the right of data subjects to access their personal data, and to exercise certain other rights, such as the right to rectification and erasure.

All TeamAware partners must comply with the GDPR because the personal data they may process as part of TeamAware belongs to data subjects whose data is being monitored for research purposes within the Union (Article 3.2). TeamAware is made up of organizations mainly headquartered in countries that are members of the European Union (EU) or European Economic Area (EEA). Activities undertaken in non-EU countries are required bythe joint controller's agreement to meet the minimum requirements set forth in it, assuring a minimum level of compliance.

The TeamAware consortium will be processing mainly data coming from:

- Representatives and contact points from members of the Advisory Boards.
- Research participants involved in the field exercises carried out within the project, some of them belonging to vulnerable categories of the population.
- Publicly available databases.
- Data generated during testing such as environmental and structural shapes, colors, decorations, etc.

And in order to remain compliant the project will follow the 7 key principles of GDPR, outlined below:

- Lawfulness, fairness and transparency
- Purpose limitation
- Data minimisation
- Accuracy
- Storage limitation
- Integrity and confidentiality (security)
- Accountability

Key societal considerations for TeamAware and their consequences:

First responders and crisis management personnel are frequently required to work in chaotic environments. This entails making judgment calls on the optimal course of action based on little information and under significant emotional and time pressure. When a first responder arrives at the scene of a car accident, for example, they must make split-second decisions about whether to provide medical help or use force if necessary. If they refuse to provide medical assistance or if they do provide medical assistance, but inadvertently damage the sufferer in the process they may face personal consequences in the form of administrative reviews with career repercussions, disciplinary hearings with potential financial implication or even prosecution posing a risk to their own freedom. All the above notwithstanding the danger to their own lives, already inherent to the profession.

As an answer to these unfortunately common challenges, the TeamAware solution aims to use Augmented Reality and Mobile Human Machine Interfaces to provide users with access to real-time, improved, accurate and manageable information, allowing them to make better decisions and avoid costly mistakes. Furthermore, these technologies have the potential to increase industry safety, efficiency, and communication.

AI raises three major ethical concerns for society: privacy and surveillance, bias and discrimination, and one of the most important implications of new technologies, the role of human judgment. Since the TeamAware systems will aid first responders in decision making, these are concerns that will be closely monitored by Eticas throughout the development of each system that makes part of the whole solution.

An important part of the monitoring process also includes the development of a Privacy Impact Assessment and active contributions to desirability and acceptability assessments, which, when combined with the sensible application of ethics requirements, results in an appropriate legal and ethical foundation to assist consortium partners in the development of knowledge and TeamAware systems, not only in compliance with GDPR, but also, and more importantly, in accordance with the ethical principles to reinforce the systems' design.

10.2.23 TeamAware WP3 Post Data

May 10, 2022 | Blogs

WP3 focuses on AI applied to EO system and computer vision applications. The work proposed, based mostly on a Deep learning approach, may require larger amounts of training data, to perform well data management issues including how to acquire large datasets and how to improve the quality of large amounts of existing data become more and more relevant. Moreover, the results of computer vision tasks based on artificial intelligence (AI) training could depend from the data : they must be sufficiently diverse, well balanced, appropriate to the context and unbiased, in order to avoid problems such as artificial “AI bias”.

Accurate data collection techniques in the era of Big data gives motivation to conduct as a first step a comprehensive survey of the data collection literature on different tasks appropriate to the TeamAware project that will be merged with data acquired in the specific test bed proposed in TeamAware project.

The main reason that leaded to this activity is because the right data contribute to generate the appropriate approach to guarantee the quality of the results. Indeed, good processing is about using the right data and algorithms at the right time.

Our work in this perimeter is to identify and to review relevant open source datasets useful to train model adapted to manmade and natural disaster scenarios. In order to cover the end-user operational requirement 3 main applications are expected to be addressed by the Visual Scene Analysis System (VSAS) system:

1. Victim detection: The aim is to create a dataset for research and rescue applications. The categories we are looking for to detect victims include images of people in various poses: lying down, sitting, and falling etc. from different distances and different angles, where some images would show the whole human body, and others would show parts of the human body. In addition, there would be images captured in a controlled environment and “in the wild” conditions. Finally, the images containing other spaces and rooms with no human would be gathered.

Considering the **natural disaster demonstration**, the VSAS system will be deployed in two phases:

- a drone equipped with an RGB-D camera (Depth Sensor - RGB camera) will enter into the disaster zone for a first appreciation of the situation and to look for stranded passengers. The video footprints are sent and will be analysed into the command-and-control station. Thanks to the AI algorithms, previously trained with a victim detection dataset, a first evaluation of the victims will be performed.
- After this first overview, an LEA wearing a helmet with an infrared (IR) camera and a standard grey camera will enter in the underground tunnel to rescue victims and to inspect in deeper the environment: other victims could be hidden by debris.

In the **human-made disaster scenario**, the helmet and the drone will be deployed and it will use to identify injured people in an demolished abandoned building

2. Situational awareness using visual segmentation: A part of the reviewed datasets that could be a valuable resources to develop and train deep learning algorithms for detection and recognition

tasks, are based on videos/images captured by drones and wearable cameras, which are the main source of video footage that will be used in the project. Beside to that, were also identified dataset that includes semantic and geometric indoor data in 2D, 2.5D, and 3D domains, as well as their instance-level annotations. Apart from these images and information, there are also point clouds and raw 3D meshes registered and semantically annotated.

3. Damage assessment: The datasets merge photos of real damages after catastrophic events and synthetic images of damaged structures. In particular the one composed by photos of reals cases, are constituted by annotated images, in which several structural elements and structural damages are identified. For both datasets, the event of reference is mostly a natural disaster, in particular earthquakes but also ground deformations (such as landslides, settlements or subsidence) that may jeopardize the structural safety. The use of the datasets may also be extended to those manmade disasters that could cause damages to structural components or to those conditions in which a suitable maintenance level for infrastructure operability is not guaranteed.

According to these 3 main tasks, D3.1, that was recently submitted, proposes a survey on exploitable dataset in the context of the TeamAware project and a perspective of data collection based on synthetic generation and a methodology for collection of data in the test sites that will be forecasted in the future.

11 Conclusions

A concise strategy has been proposed targeting specific audiences and proposing tools, means and time plan per audience in D14.1 Dissemination and Communication Plan, its second version D14.4 and third version D14.9. Some tools have already been developed (e.g., social media strategy, newsletter) and communication and dissemination has already started, as is demonstrated in this report. Importantly, the dissemination plan includes metrics upon which one can monitor activity and progress and ensure that the intended outcomes are met.

In line with the dissemination strategy/plan, the consortium worked quite hard on the dissemination activities on a number of channels to promote the TeamAware project results. This document is a working document and gives a status update on the dissemination plan and achievements for the second year of the project.