Horizon Europe | *Civil Security for Society*

1. Destination – Better protect the EU and its citizens against Crime and Terrorism

Call – <u>Disaster-Resilient Society</u> 2023

Session Chairs:

- *Isabelle Linde-Frech (Fraunhofer INT)*
- *Christian Derler (Joanneum Research)*
- *Krzysztof Samp (ITTI)*

Disaster-Resilient Society for Europe

#	Organisation	Presenter
CL3-2023-DRS-01-01: **Improving social and societal preparedness for disaster response and health emergencies**		
1	VTT	Ville Ollikainen
2	Trinity College Dublin	Derek Ross
3	AAHD	Dr Umit Bal
CL3-2023-DRS-01-02: **Design of crisis prevention and preparedness actions in case of digital breakdown (internet, electricity etc.)**		
4	NTNU Social Research (NSR)	Dr. Ivonne Herrera
5	ITTI	Kamila Stroińska
CL3-2023-DRS-01-03: **Operability and standardisation in response to biological toxin incidents**		
6	Military Institute of Chemistry and Radiometry	Tomasz Sikora

Disaster-Resilient Society for Europe

#	Organisation	Presenter
CL3-2023-DRS-01-05: **Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments**		
7	STAM	Umberto Battista
8	TNO	Rogier van der Weerd
9	German Rescue Robotics Center (DRZ)	Robert Grafe
10	AAHD	Dr. M. Turhan Sofuoglu
11	Tree Technology	Dr. Javier Gutiérrez Meana
12	Gradiant	Alicia Jiménez
13	Czech University of Life Sciences in Prague	Frantisek Kumhala

3

Disaster-Resilient Society for Europe

#	Organisation	Presenter
CL3-2023-DRS-01-06: **Increased technology solutions, institutional coordination and decision-support systems for first responders of last-kilometer emergency service delivery**		
14	Blockchain2050 BV	Konstantina Koutsiara
15	CEA	Antonin Galtier
16	German Federal Agency For Technical Relief (THW)	Nils Krippner
17	Enide	Radivoj Malić
18	Fraunhofer EMI	Dr. Ivo Haering

DRS-01-01

Improving social and societal preparedness for disaster response and health emergencies

#	Organisation	Presenter
1	VTT Technical Research Centre of Finland	Ville Ollikainen

Disasterous Communications (DISCO)

- *Ville Ollikainen*

- *ville.ollikainen@vtt.fi*

- *VTT Technical Research Centre of Finland*

- Role: *Proposal coordinator, WP leader, S/T provider; TBD*

- Proposal activity: *HORIZON-CL3-2023-DRS-01-01*

6

Proposal idea/content

- *Addressing Disaster-Resilient Society 2023*
  - Project proposal: Disasterous Communications (DISCO)

- *The BASIC idea is to focus on communications*
  1. *Make official communications transparent (proven authenticity) and prevailing over fake/disinformation*
  2. *Target communications to vulnerable people; focus on basics, helping also others to understand*
  3. *Create a fast lane to online advertising and digital signage platforms, etc.*

7

Project participants

- Existing consortium:
  - Relevant partners in Horizon Europe HELIOS (2019-2022) consortium contacted; social media, citizen journalism, media, technologies, human studies, cybersecurity, cryptography
  - N.B. these profiles are not exclusive

- Welcoming to discussions partners with the following profiles:
  - *Media industry, content producers*
  - *Fake news analysis*
  - *Healthcare, pandemics, diagnostics,…*
  - *Steganography*
  - *Social / social media / social graph experts*
  - *Digital signage, online advertising, …*
  - *AI / ML*
  - *NLP*
  - *Everyone who feels having something relevant to the call*

DRS-01-01

Improving social and societal preparedness for disaster response and health emergencies

#	Organisation	Presenter
2	Trinity College Dublin	Derek Ross

Societal Enhanced Framework for Emergency Resilience (SAFER)

- *Derek Ross*
- *Derek.Ross@tcd.ie*
- *Trinity College Dublin*
- Role: *Proposal coordinator, WP leader*

- Proposal activity: *HORIZON-CL3-2023-DRS-01-01: Improving social and societal preparedness for disaster response and health emergencies*

SAFER Proposal idea/content

- *Resilience Framework and Solutions across society actors that fosters inclusive pro-active risk management capacity building*
- *This will accommodate pluralism, diversity and equality through innovative socio-technical systems analysis*
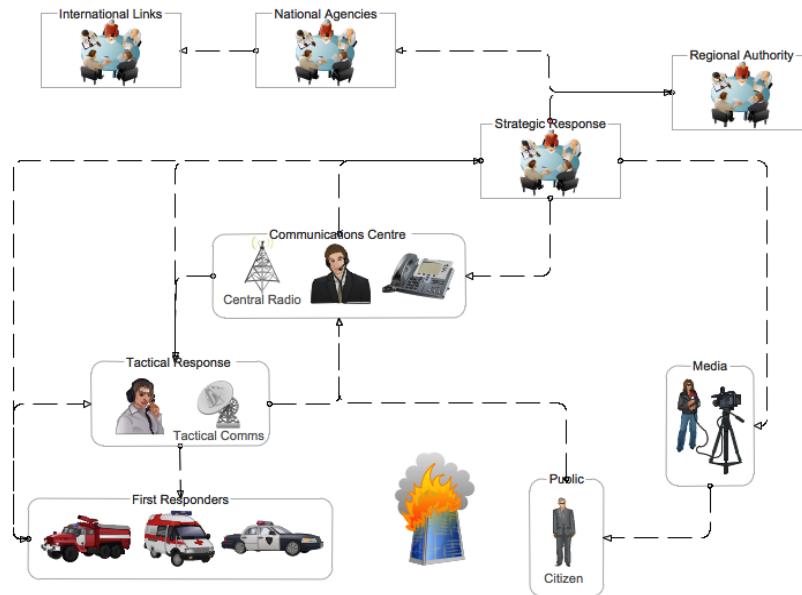
Spontaneous
unAffiliated
Volunteers in
Emergency
Response
Systems
SAVERS

SMS4EMS

SAFER Project participants

- Existing consortium:
  - Proposed coordinator: *Trinity College Dublin / open to discuss*
  - Partners / Other participants: *An established consortium (tbc) from 2022 submission with experts including: citizen and societal representatives; disaster responders and competent authorities; technology; and technical (legal, ethical and communication).*

- Looking for partners with the following expertise/ technology/ application field:
  - *Gender, Diversity, Inclusion*
  - *Resilience tools and solutions*
  - *AI and ML*

Derek Ross derek.ross@tcd.ie

DRS-01-01

Improving social and societal preparedness for disaster response and health emergencies

#	Organisation	Presenter
3	AAHD	Dr Umit Bal

Cross Culture Disaster Response for All

- *Dr. Umit BAL*
- *E-mail: ismailumitbal@gmail.com*
- *Emergency, Disaster and Ambulance Physicians Association (AAHD)*
- *FR-Emergency Medical Response NGO,*
- Role: *WP leader, S/T provider*
- Proposal activity: HORIZON-CL3-2023-DRS-01-01: Improving social and societal preparedness for disaster response and health emergencies

SMS4EMS

Since 2008 ➡ **15 Years Experience in EU Projects**

14

SMI2G Cross Culture Disaster Response for All

- *Health illiteracy and inequalities are barriers for effective disaster response. Crisis communication (4 all) for acute situations so gain resilience to use Crisis time. Considering all languages, gender, etc…*

- *Community Based DRR training, (Living Lab and APPs)*

- *Surveillance (app?) for early detection of emerging zoonosis (Syndromic Surveillance, severity, geographic distribution, host, transmission routes, etc.)*

- *Thermal drone, Crowdsourcing, monitoring + Public Health*

- *Preparation of mobile Living Labs to use the most vulnerable areas*

Horizontal
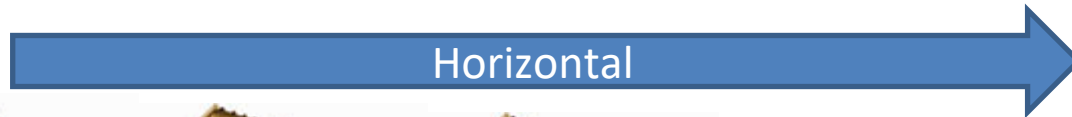
V E R T I C A L

Pilot 1   Pilot 2   Pilot 3

15

SMI2G   Cross Culture Disaster Response for All

- *AAHD has been responding to all kinds Disasters and unexpected incidents*
- *AAHD can provide; KPIs, User requirements, Use Cases, Tailor-made scenarios*
- *Next Generation Technologies for Emergency and Disaster Response*
- *Contributing with the experience from the successfully concluded or ongoing H2020 Projects*
- *Large demonstration capabilities (field testing) for the utilization of largely existing capabilities and combining them into a single, user-friendly platform.*

16

Project participants

- Existing consortium:
  - Proposed coordinator: AAHD/*?*
  - Partners / Other participants: *Ethics, SSH (Bel) , University (Law-Serb), Municipality (Tur), veterinary services (Tur), NGO (citizen)*
- Looking for partners with the following expertise/ technology/ application field:
  - *University (Infectional dis. clinic / Law)*
  - *Children/elder care NGOs*
  - *SME -(positioning, AI, ChatGPT)*
  - *Large Industry (Crowdsourcing, app, drone-termal)*
  - *CSO (SSH- Gender)*
  - *FRs*

17

DRS-01-02

Design of crisis prevention and preparedness actions in case of digital breakdown (internet, electricity etc.)

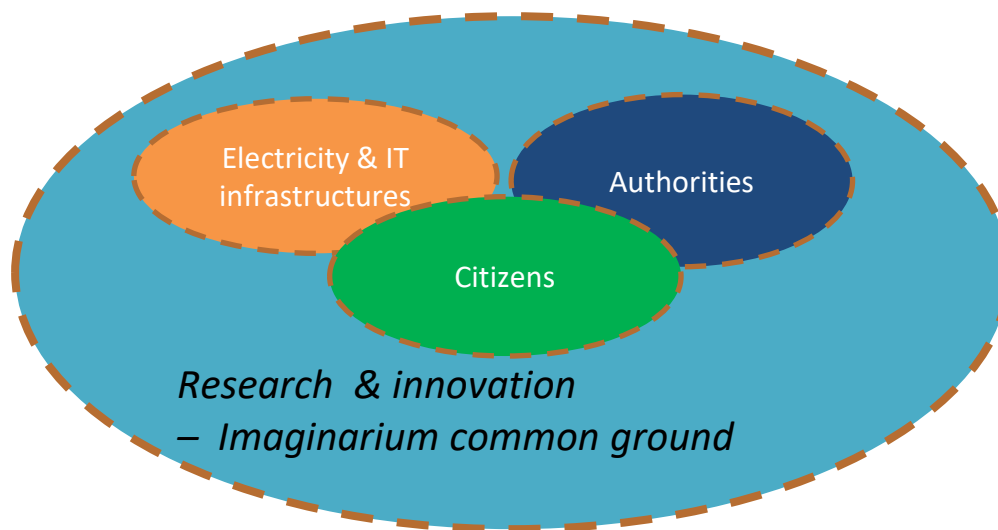| #	Organisation	Presenter
4	NTNU Social Research (NSR)	Dr. Ivonne Herrera

FutureImaginaries

- *Dr. Susanne Therese Hansen & Dr. Ivonne Herrera*

- *susanne.hansen@samforsk.no; ivonne.herrera@samforsk.no*

- *NTNU Samfunnsforskning – NTNU Social Research*

- Role: *WP leader, partner, SSH & resilience*

- Proposal activity: *HORIZON-CL3-2023-DRS-01-02 - Design of crisis prevention and preparedness actions in case of digital breakdown (internet, electricity etc.)**

  *Our organization has interest in joining efforts on other INFRA & DRS topics

- Through co-creation and context-sensitive approaches, the overall objective of *FutureImaginaries* is twofold:

  - to co-create knowledge and increase capacity to deal with digital breakdown crises at different levels (local, regional and supranational) and together with relevant energy stakeholders (communities, civil protection, national security, regional and local authorities, private sector responsible for critical infrastructures).

  - to provide policy recommendations to the EU based on the co-created knowledge; and provide socio-technical solutions for handling interdependencies and cascade effects when dealing with digital breakdown crisis in the energy delivery value chain.

FutureImaginaries - Capacity building perspective

- *Develop an arena for citizens and authorities to catalyze dialogue and trust*

- *Contribute with co-created knowledge and systematized experience on strategies dealing with surprising events at community, regional and supranational levels*

- *Capacity building development in action labs where researchers, citizens and stakeholders co-create future scenarios and socio-technical solutions*

Electricity & IT infrastructures

Authorities

Citizens

Research & innovation – Imaginarium common ground

21

Project participants

Existing partners:

- Have
  - NTNU Social Research (NSR): SSH expert on participatory methods and social innovation bringing results from EC and national research projects within resilience and energy
  - SINTEF Energy: Expertise on electricity distribution systems and bridging links and results from national centre for intelligent electricity distribution
- Might have
  - Private: Electricity grid operators – power grid companies and system operators
  - National, regional and local authorities
- Looking for partners to create a consortium or to join a matching one

22

DRS-01-02

Design of crisis prevention and preparedness actions in case of digital breakdown (internet, electricity etc.)

#	Organisation	Presenter
5	ITTI	Kamila Stroińska

COSIB - Crisis cOmmunication Systems In digital Breakdowns

- **Kamila Stroińska, Andrzej Adamczyk**
- kamila.stroinska@itti.com.pl, andrzej.adamczyk@itti.com.pl
- **ITTI** (SME, Poznań, Poland)
- Role: **WP leader, Technical leading partner, software developer**

- Proposal activity: HORIZON-CL3-2023-**DRS-01-02**, Design of crisis prevention and preparedness actions in case of digital breakdown (internet, electricity etc.)
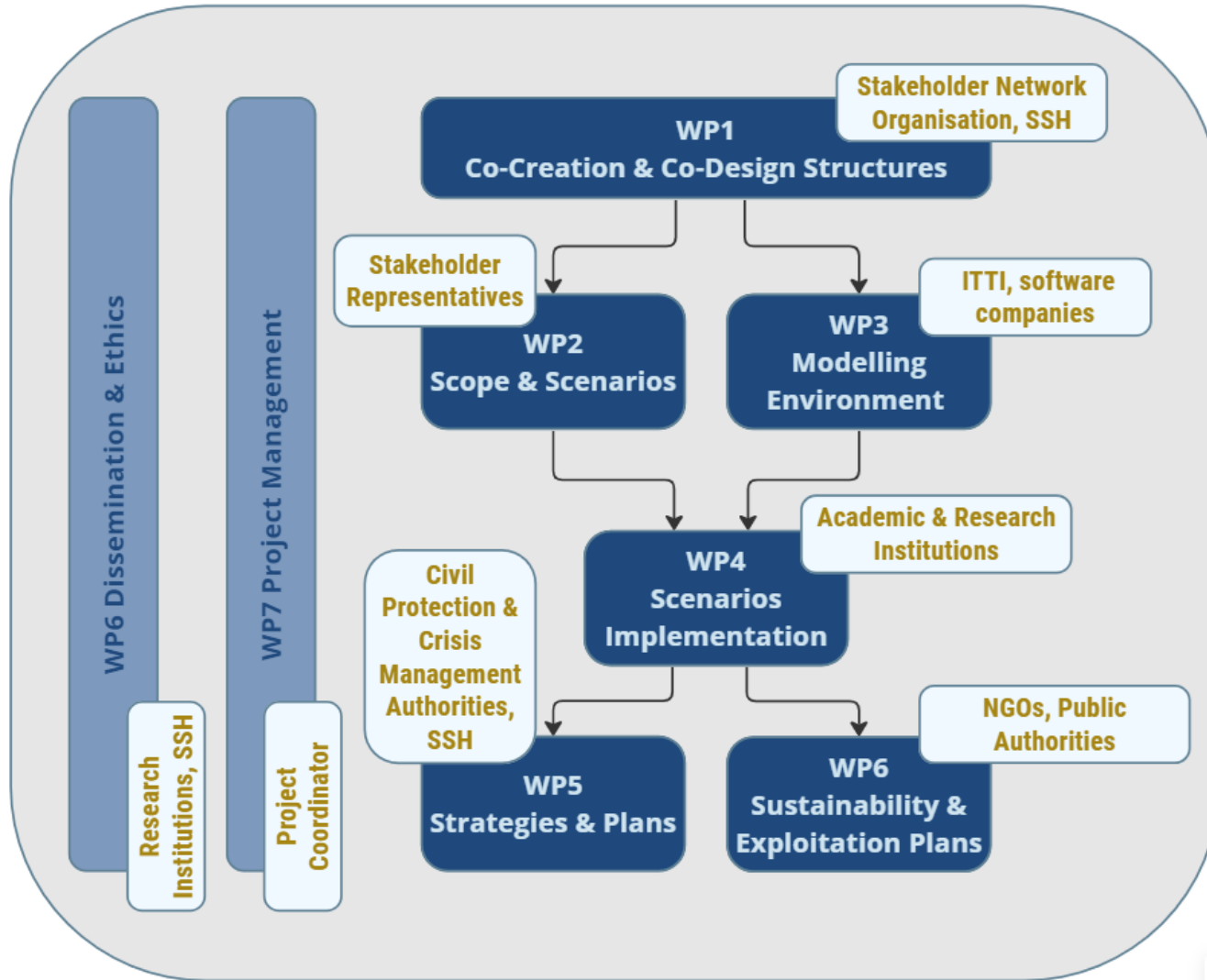
24

COSIB idea

- *Scope:*
  - *Identification of **interdependencies** among **critical infrastructures** (big metropolises, vulnerable industries & public services) and **services***
  - *Electricity outage and digital breakdown situations*
- *Aim/Goal:*
  - *Development of **citizen-friendly tool***
  - ***Optimisation of communication systems (including crisis communication) and architectures***
- *Methodology: **Scenario-based analysis** (cascading effects modelling & simulation, evaluation & optimisation)*
- *Expected results: plans of **prevention and preparedness actions** (including civil protection plans)*

25

Kamila Stroińska (kamila.stroinska@itti.com.pl)/ Andrzej Adamczyk (andrzej.adamczyk@itti.com.pl)

Project participants & WP structure

Kamila Stroińska (kamila.stroinska@itti.com.pl)/ Andrzej Adamczyk (andrzej.adamczyk@itti.com.pl)

Project participants

- Existing consortium:
  - ITTI (SME)
  - Identified several partners (**end users, RTOs**) potentially interested in participating in the proposal
- Looking for partners:
  - Proposal **coordinator**
  - **Critical infrastructure managers** in large metropolitan centers, crisis managament/civil protection authorities, private sector and actors responsible for critical infrastructures
  - Institutes for applied research in the areas of security, **SSH**
  - **Citizen organizations** (e.g. organisations with experience in civil contingency planning and training)

27

DRS-01-03

Operability and standardisation in response to biological toxin incidents

#	Organisation	Presenter
6	Military Institute of Chemistry and Radiometry	Tomasz Sikora

A system for identifying biological hazards

- *Tomasz SIKORA*
- *t.sikora@wichir.waw.pl*
- *Military Institute of Chemistry and Radiometry*
- Role: *WP leader*

- Proposal activity: **CL3-2023-DRS-01-03**: Operability and standardisation in response to biological toxin incidents

Proposal idea/content

The aim of this proposal and some keys:

- Development of an integrated system for field detection and identifcation of biological threat;
- Detection of possible threats in order to support counter actions – risk analysis, real time threat assessment;
- Threat analysis at strategic, operational level (real time)
- Automatic selection of the decontamination method on site based on AI;
- Risk assessment and hot-zone determination;
- Improve the collection and analysis of samples;
- Simulations of possible scenarios.

30

Strong points and experience

Our capabilities:

- development of the sensors and portable device for field actions

- **Mobile device for detection of biological threat –** mounted on unmanned vehicles dedicated to detect main bacteria used as biological weapon

- **A Mobile Device for Monitoring the Biological Purity of Air and Liquid Samples**
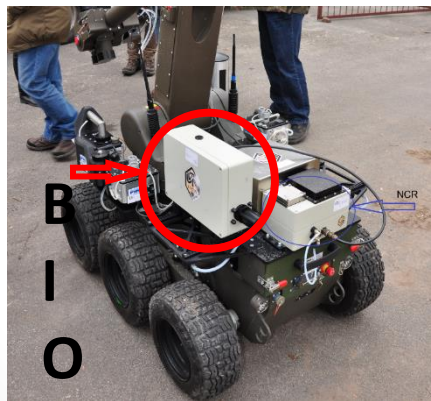
Project participants

- Existing consortium:
  - Military Institute of Hygiene and Epidemiology

- Looking for partners with the following expertise/ technology/ application field:
  - experts on biological threats and biological weapons
  - constructors and programmers (especially in the field of artificial intelligence)
  - technology recipients and end users

Tomasz Sikora t.sikora@wichir.waw.pl

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

#	Organisation	Presenter
7	STAM	Umberto Battista

RAILSAFE "Robotics and Simulation for Increased Safety and Efficiency in Hazardous Rail Environments"

Umberto Battista, Chief Technology Officer
u.battista@stamtech.com

Stam S.r.l. (www.stamtech.com)
- High-tech Italian engineering SME
- 25 years of experience in R&D
- 80 successful EU R&D and ISF projects since FP4
- 15 EU security projects (several as coordinator)
- Currently coordinating SAFE-CITIES "CL3-2021-FCT-01-07"

Role: Possible coordinator, Technology provider

Proposal activity: HORIZON-CL3-2023-DRS-01-05: "Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments"

Project Idea

- Development of an **autonomous** or **semi-autonomous** Unmanned Ground Vehicle (UGV) system that can be used in hazardous environments, designed to work in tandem with **simulations**, allowing first responders to:
  - experience a real-time **response scenarios** that can be adjusted based on the actions of the UGV system;
  - test their response strategies and tactics in a **safe and controlled environment**;
  - improve **safety and security standards** in hazardous environments;
  - operate **remotely** without endangering themselves or others;
- Development of a **simulation environment** to support first responders in hazardous environments, able to:
  - supplement the **skills** of first responders in hazardous environments;
  - improve **training** and **preparedness** of first responders for emergency situations;
  - allow first responders to **learn and experience** different scenarios, understand the potential hazards, and **practice** their response strategies;
  - increase first responder **efficiency** and reduce personnel **risks**;
  - make the **user-UGV interaction** intuitive and with minimal training needed.
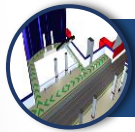
Background of Organization

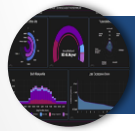- Multi-method **simulation models** and **digital twins** of **complex systems**, **infrastructures**, **processes**

- Modelling and simulation of **operational**, **emergency** and **what-if scenarios**

- Agent-based modelling of **human** and **crowd behaviours**
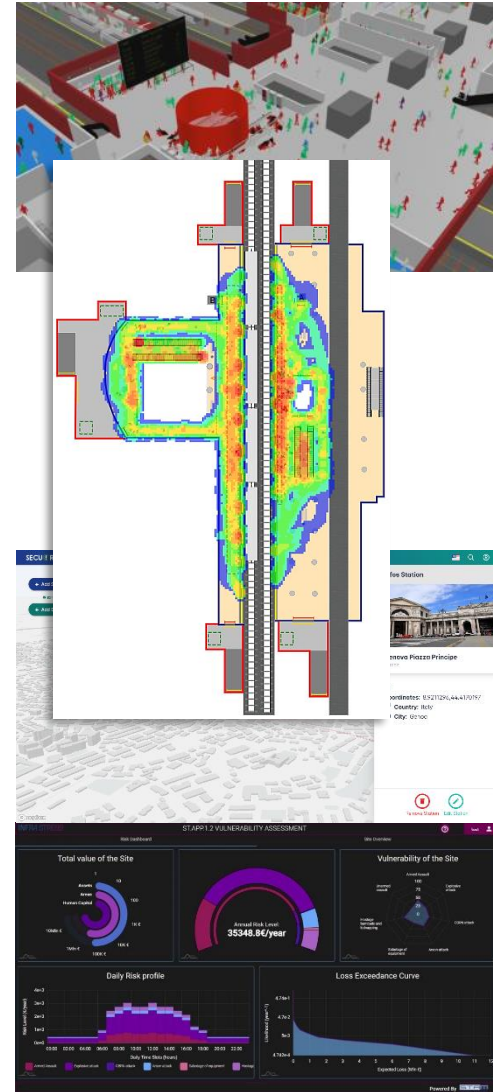
- **Serious gaming** and **eXtended Reality**

- Decision-support tools for **risk and asset management**

- Decision-support tools for **environmental and territorial protection** based on GIS and EO data

36

Project Participants

- **Coordinator (possible): Stam**

- **Partners:**
  - Transport use-cases
  - Robotic RTO
  - First responders
  - CBRNe experts
  - Simulation and XR tech providers
  - Training experts

- **Looking for:**
  - Governments and public authorities
  - Technology providers
  - End-users

Umberto Battista – u.battista@stamtech.com

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

| #	Organisation	Presenter
8	TNO	Rogier van der Weerd

Human-Machine Teaming in disaster response to crises in hazardous industrial environments

- *Rogier van der Weerd*

- *rogier.vanderweerd@tno.nl*

- **TNO**

- Role: *(t.b.d.) Proposal coordinator / WP leader*

- HORIZON-CL3-2023-DRS-01-05 / Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

Proposal idea/content

- *Lowering the barriers for **human-machine teaming** (HMT) in **disaster response** operations*

- *Focus on **CBRN mapping** and **interventions** during larger scale incidents on industrial complexes (harbour, (petro)chem sites)*

- *Hybrid solutions: combining **autonomy** with **immersive tele-operation***

  - Autonomous exploration and risk assessment to build intuitive situational awareness real-time

  - Human intervention during mission when the task requires human expertise or when autonomy fails

  - Extend hybrid collaboration to response execution: physical interventions

- *Key premises*

  - Hybrid solutions enable earlier deployment of autonomous systems

  - Key is progressive context disclosure for control switching

  - Compound capability growth: from robust basic functionality to more advanced tasks

40

rogier.vanderweerd@tno.nl
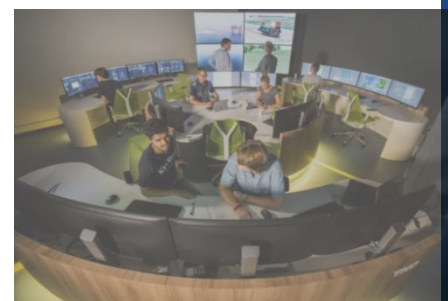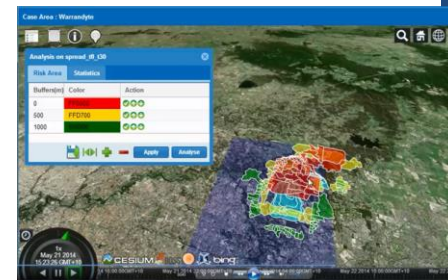
Project participants

- TNO brings expertise in
  - Autonomous mission execution with umanned robotic platforms and immersive tele-operation where required; MUM-T + SA/SU
  - Mission planning of multiple systems as a team: mapping, monitoring & detection, interventions
  - Adaptation of 'Concepts of Operations' for hybrid and heterogeneous teams (man-machine)
  - Domain expertise in National Security and Civil Protection

- Consortium development in early stages:
  - Proposed coordinator: *T.b.d. (possibly TNO)*
  - We anticipate interest from Dutch partners in national security (Dutch Police, Dutch Fire Services, NIPV/security regions, …) and operators (such as Rotterdam harbour, Chemelot, industry)

- Looking for partners with the following expertise/ technology/ application field:
  - Domain expertise on disaster management
  - Adaptation of disaster prevention and response plans (predictable, explainable, traceable behaviour)
  - Automatic detection (CBRN) & fusion / decision support
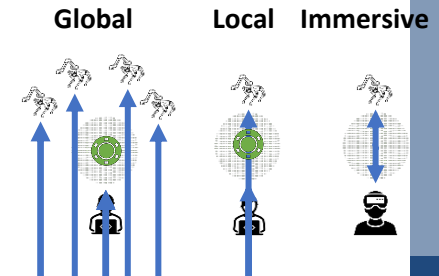
Global   Local   Immersive

41

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

#	Organisation	Presenter
9	German Rescue Robotics Center (DRZ)	Robert Grafe

AFFORD: Robotic Capability Integration for Advancing the Safety&Security of First Response Operations in Dangerous Environments

- *Robert Grafe*

- *Robert.Grafe@rettungsrobotik.de*

- *German Rescue Robotics Center*

- Role: end user, *WP leader,* possibly *proposal coordinator*

- Proposal activity: HORIZON-CL3-2023-DRS-01-05
  Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

43

AFFORD proposal content

Strongly user-centric:

- CBRNe, indoor fire, building collapse
- Fire brigades, police & other first response orgs. from >>3 countries as full or associated partners
- Focus groups, Surveys, Hands-on Workshops

- Multiple robotic platforms
- Modular sensor interfaces
- Multirobot operation
- Perception & multimodal interpretation
- User interfaces for situation awareness & assisted teleoperation for recon & manipulation

Scenario Design & Requirements analysis

Technology Research & Development

Transfer into deployment, integration models

Increasing awareness & acceptance

- Field trials & training
- Robot-assisted team performance evaluation
- Operating procedures
- Communication First Responders – Academia – Companies – Public

- Tests & joint exercises in realistic conditions
- Deployment of prototypes
- Development of models for Robotic Task Force(s) in several EU countries

44

DRZ Competences

Robert Grafe, DRZ, robert.grafe@rettungsrobotik.de
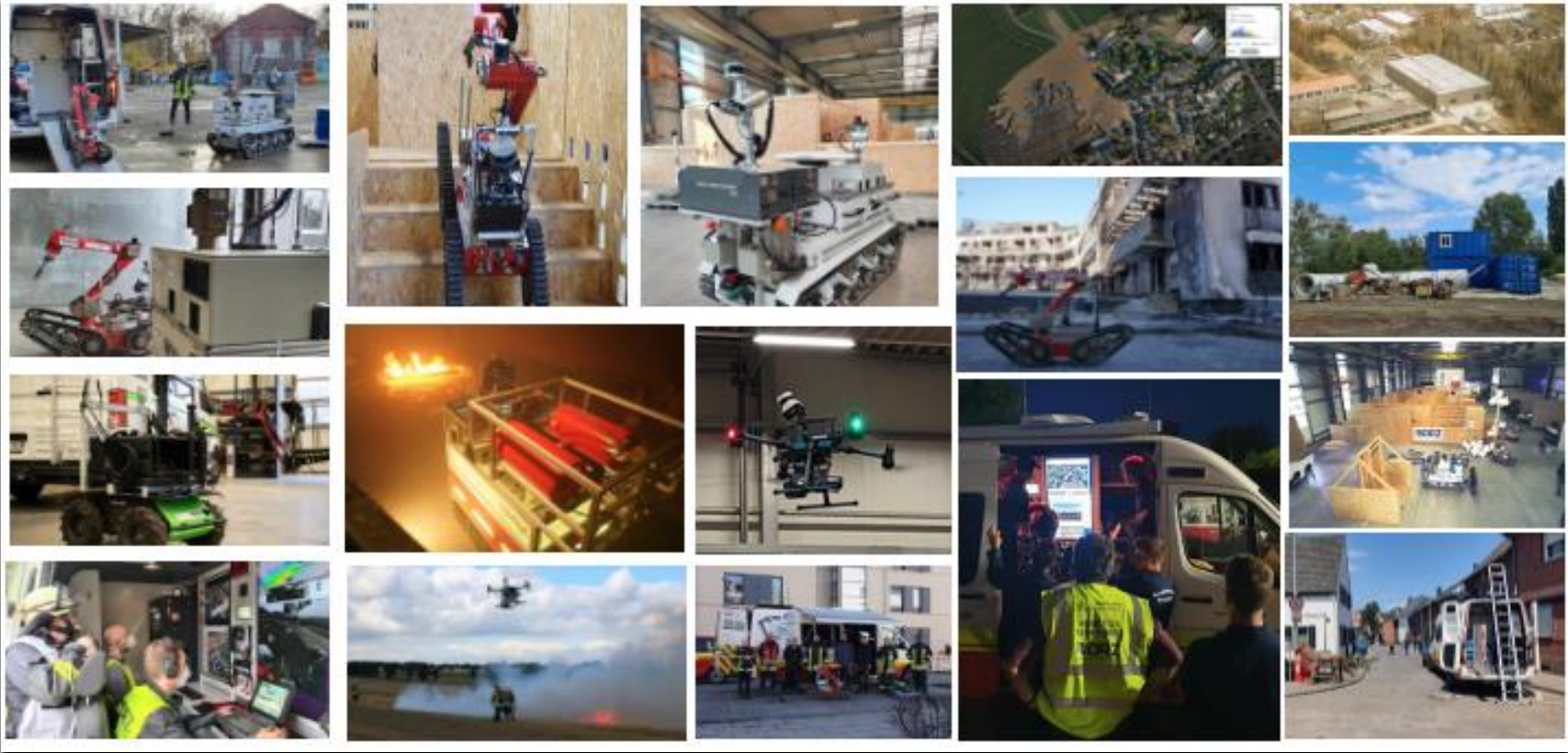
Project participants

- Existing consortium:
  - Proposed coordinator: *possibly DRZ*
  - Partners / Other participants:
    several potential first responder organisations and R&D partners in Germany, Austria, The Netherlands, Sweden, Czech Republic

- Looking for partners with the following expertise/ technology/ application field:
  - *First responders from other countries*
  - *Robot/sensor manufacturers to share & integrate*
  - *R&D companies or academia innovating robot and sensor HW/SW, perception data processing, situation awareness and robot control interfaces*

46

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

#	Organisation	Presenter
10	AAHD	Dr. M. Turhan Sofuoglu

UGV4TRIAGE

- *Dr. Turhan Sofuoglu*
- *E-mail: turhans112@gmail.com*
- *Emergency, Disaster and Ambulance Physicians Association (AAHD)*
- *FR-Emergency Medical Response, NGO*
- Role: *WP leader, S/T provider*
- Proposal activity: HORIZON-CL3-2023-DRS-01-05: Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

SMS4EMS

Since 2008 ➡ *15 Years Experience in EU Projects*

48

UGV4TRIAGE idea/content

- *Triage is a life-saving practice in disasters.*
- *UGV and UAV supported first responders will be able to do more work in less time, with less personnel and more safely.*
- *Triage of the causalities in the hazardous zone could be possible.*
- *More human lives could be saved.*
- *'False negative cases identified by AAHD from 2023 Turkiye Earthquakes' will be used.*


Strategies		
Tactics	Tactics	Tactics

Procedures	Procedures	Procedures	Procedures	Procedures
SOPs	SOPs	SOPs	SOPs	

Dr. Turhan Sofuoglu   turhans112@gmail.com

SMI2G UGV4TRIAGE idea/content

- *AAHD can provide; KPIs, User requirements, Used Cases, Tailor-made scenarios, Next Generation Technologies for Emergency and Disaster Response*

- *Autonomous vehicles are an important area where artificial intelligence is used. We aim for a fast and accurate triage with artificial intelligence supported autonomous vehicles and drones with less people*

- *Identifying the dangers in the environment, determining the number of casualties to be triaged, remote management of the operation, training of the first responders, and providing a social gain with an ethical and legal practice are among the objectives of the project.*
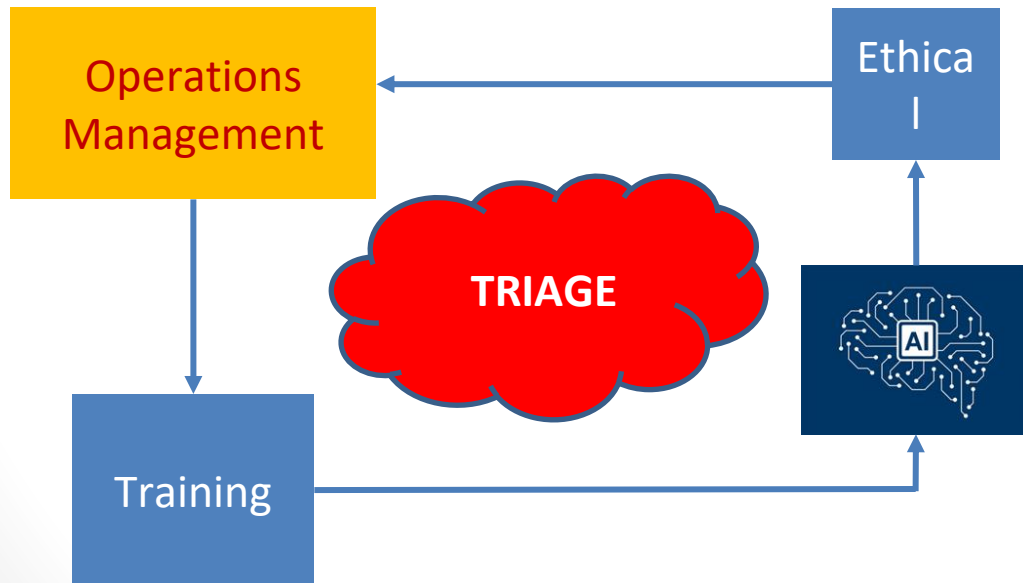
Operations Management

Ethical

TRIAGE

AI

Training

50

Project participants

- **Existing consortium:**
  - Proposed coordinator: *AAHD/ ?*
  - Partners / Other participants: *FRs (Fire fighter), Industry (Drone-Spain), University (Ethics), NGO (citizens volunteers - the Netherlands), SME (AI-Estonia), Municipality (Tur)*

- **Looking for partners with the following expertise/ technology/ application field:**
  - *FRs (LEA, Civil defense)*
  - *Technology Provider SME*
  - *Communication Provider Industry/SME*
  - *UGV SME/industry*
  - *SSH CSO-RTO-University*

Dr. Turhan Sofuoglu   turhans112@gmail.com

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

#	Organisation	Presenter
11	Tree Technology	Dr Javier Gutiérrez Meana

CONCORDIA

Enhan**C**ed situati**O**nal aware**N**ess and resilien**C**e **O**f fi**R**st respon**D**ers in r**I**sky situ**A**tions
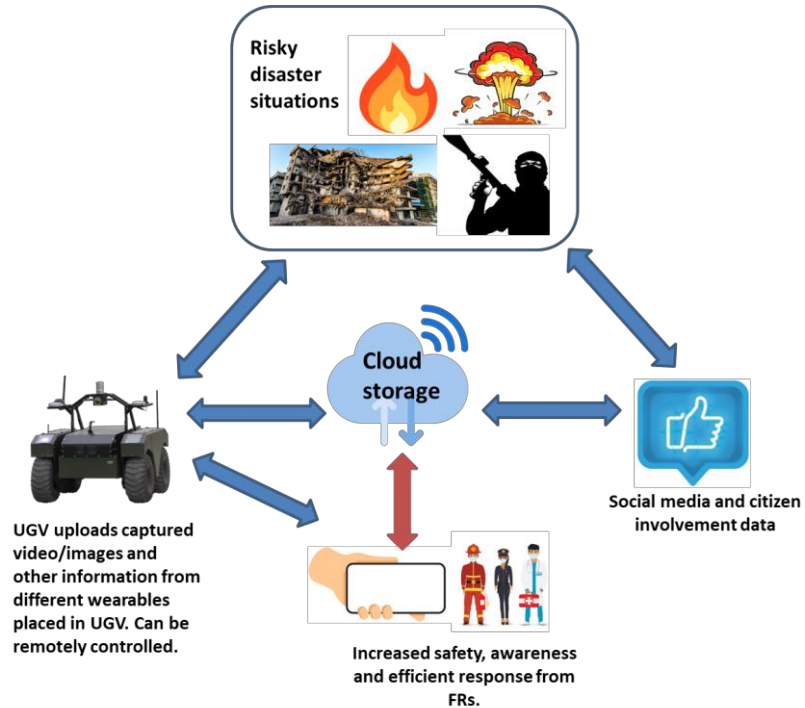
- *Dr Javier Gutiérrez Meana*
  - *javier.gutierrez@treetk.com*
- *Ms Rita Nogueira Rebelo*
  - *rita.Nogueira@treetk.com*
- *TREE TECHNOLOGY (Spanish SME)*
  - *Participation in > 30 EU projects*
  - ***12 on-going H2020/HEUR projects*** *(+2 to start soon)*
    - ***4 in SECURITY*** *cluster*
  - *Expertise in Big Data, AI and cybersecurity*

- Role: *WP leader, S/T provider*

- Proposal activity: ***HORIZON-CL3-2023-DRS-01-05:*** "Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments".

T R E E
TECHNOLOGY

53

CONCORDIA

EnhanCed situatiOnal awareNess and resilienCe Of fiRst responDers in rIsky situAtions

- Motivation:
  - First Responders (FRs) need to be protected, connected and fully aware in disaster situations, to perform their jobs without exposing their lives.
  - In disasters, the surrounding environment could be risky for FRs.

Risky disaster situations

Cloud storage

UGV uploads captured video/images and other information from different wearables placed in UGV. Can be remotely controlled.

Increased safety, awareness and efficient response from FRs.

Social media and citizen involvement data

- Solution:
  - Robotics and automated systems can help increase productivity and efficiency to prevent, prepare, and/or respond disasters situations .
  - Fusion of information from several types of sources.
  - Enhances reaction capability/time, flexibility and crisis management, without endanger FRs, through autonomous systems .

54

Javier Gutiérrez (javier.gutierrez@treetk.com), Rita Nogueira (rita.nogueira@treetk.com)

Project participants

- Existing consortium:
  - Proposed coordinator: *TREE TECHNOLOGY (open)*
  - Partners / Other participants:
    - Experts in A.I. : status confirmed.
    - Experts in citizens engagement software: status confirmed.
    - Experts in structural risk analysis: status confirmed.
    - End-users: status to be confirmed.

- Looking for partners with the following expertise/ technology/ application field:
  - *Human Machine Interface*
  - *Robotic/wearables systems*
  - *Mobile interfaces*

Javier Gutiérrez (javier.gutierrez@treetk.com), Rita Nogueira (rita.nogueira@treetk.com)

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

#	Organisation	Presenter
12	Gradiant	Alicia Jiménez

NextGen Rovers

- *Alicia Jiménez*
- *ajimenez@gradiant.org*
- *Gradiant (RTO, Spain)*
- Role: *WP leader, S/T provide*

- Proposal activity: HORIZON-CL3-2023-DRS-01-05: Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

NextGen Rovers

- **NextGen Rovers objective is to improve the situational awareness and communications of UGVs.**
  - *Improved positioning accuracy through the use of GALILEO, sensor fusion and the possibility of integrating high-precision local positioning based on UWB.*
  - *Redundant communication system based on datalink (LoS) and cellular communications (3G, 4G & 5G), possibility of integrating satellite communication*
  - *Image and video processing via AI onboard hardware or via 5G edge computing*
  - *Route planning and replanning in real time ("provides the vehicle with intelligence to make decisions autonomously")*

58

Project participants

- Existing consortium: No
  - Gradiant role: WP/task leader in UGVs communication systems and route planning and monitoring

- Looking for partners with the following expertise/ technology/ application field:
  - *Law enforcement authorities*
  - *UGV manufacturers, integrators and/or operators*
  - *Sensor manufacturers*
  - *AI experts for decision making*
  - *Legal & ethical partner*
  - *End users experience monitoring and impact*

59

DRS-01-05

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

| #	Organisation	Presenter
13	Czech University of Life Sciences in Prague	Frantisek Kumhala

Drones for Disaster-Resilient Society

- ***Frantisek Kumhala***
- ***kumhala@tf.czu.cz***
- ***Faculty of Engineering, Czech University of Life Sciences in Prague***
- Role: *WP leader, S/T provider*

- Proposal activity:
- ***CL3-2023-DRS-01-05:*** *Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments*

František Kumhála; kumhala@tf.czu.cz

Proposal idea/content

- *Using AI in drones for searching lost people; autonomous search, the operator is contacted upon identification, with the use of VR/AR glasses will decide on the next course of action. The operator can then send a rescue ground drone.*

- *Participation principle: air drone for mapping, data processing, ground drone performs the intervention according to the data of the air drone.*

- *Using AI in ground drone for mine detection (war in Ukraine). Autonomous search, the operator is contacted upon identification, with the use of VR/AR glasses will decide on the next course of action.*

- *Proof-of-concept Research. The use of AR/VR glasses as human-machine interaction technology.*

František Kumhála; kumhala@tf.czu.cz

Proposal idea/content
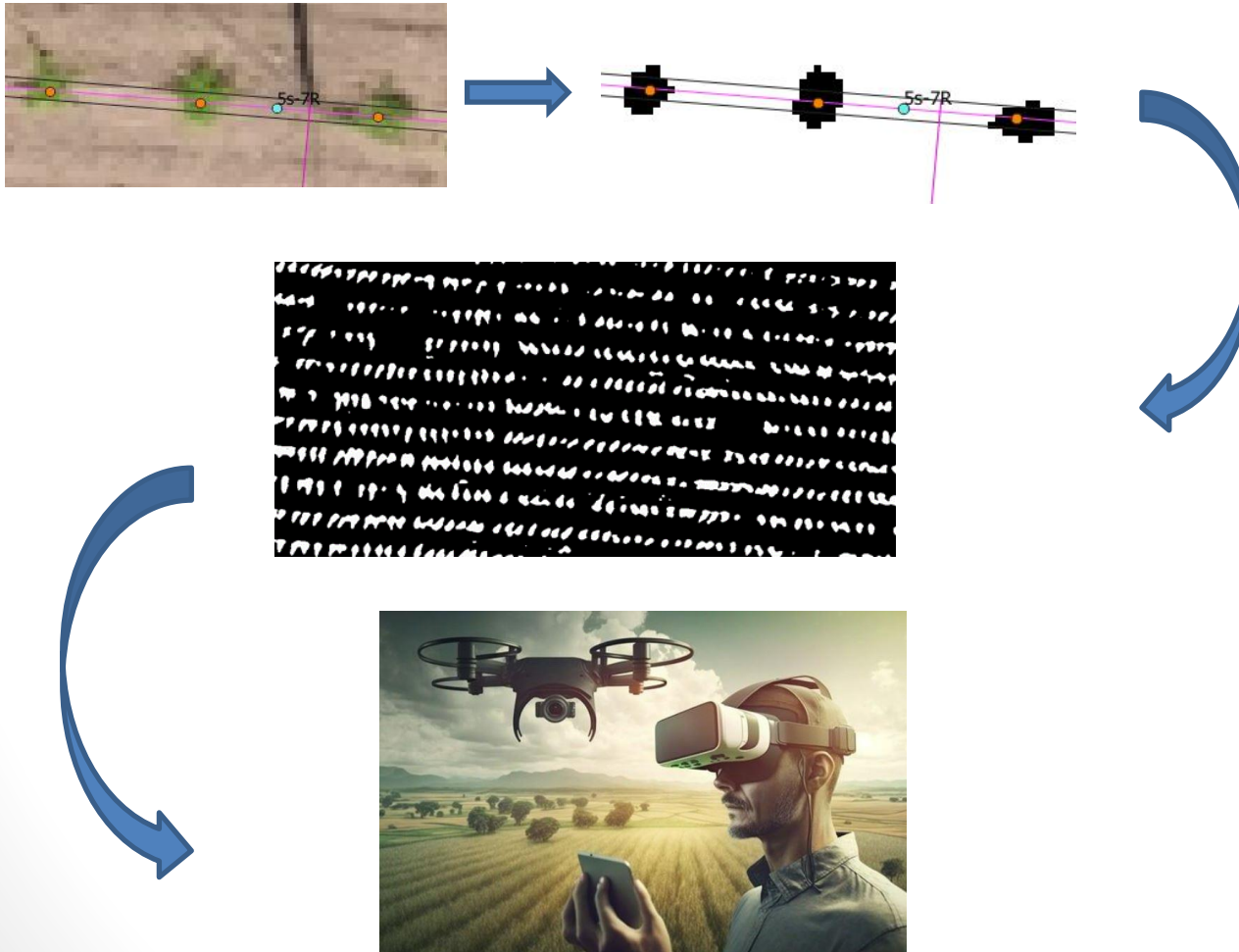
Project participants

- Project partner setting up a consortium:
  - Our partner organizations: *Bednar FMT; Farmet; VÚZT Prague; CE Industries*
- Looking for coordinator and partners with the following expertise/ technology/ application field:
  - *Expertise in robotics systems, security, civil protection, strategic planning, etc.*
  - *Communication, Dissemination & Exploitation*
  - *Ethics, Legal and Societal area*
  - *Pilot sites to test the technology (fire brigade, emergency medical services, etc.)*

64

DRS-01-06

Increased technology solutions, institutional coordination and decision-support systems for first responders of last-kilometer emergency service delivery

#	Organisation	Presenter
14	Blockchain2050 BV	Konstantina Koutsiara

ISLA-FED

- *Konstantina Koutsiara, Senior Consultant*
- *koutsiara@blockchain2050.io*
- *Blockchain2050 BV (BC2050)*
- Role: *Proposal coordinator*

- Proposal activity: *Satellite IoT integrated with smartphones for first responders of last-kilometer emergency service delivery*
- HORIZON-CL3-2023-DRS-01-06
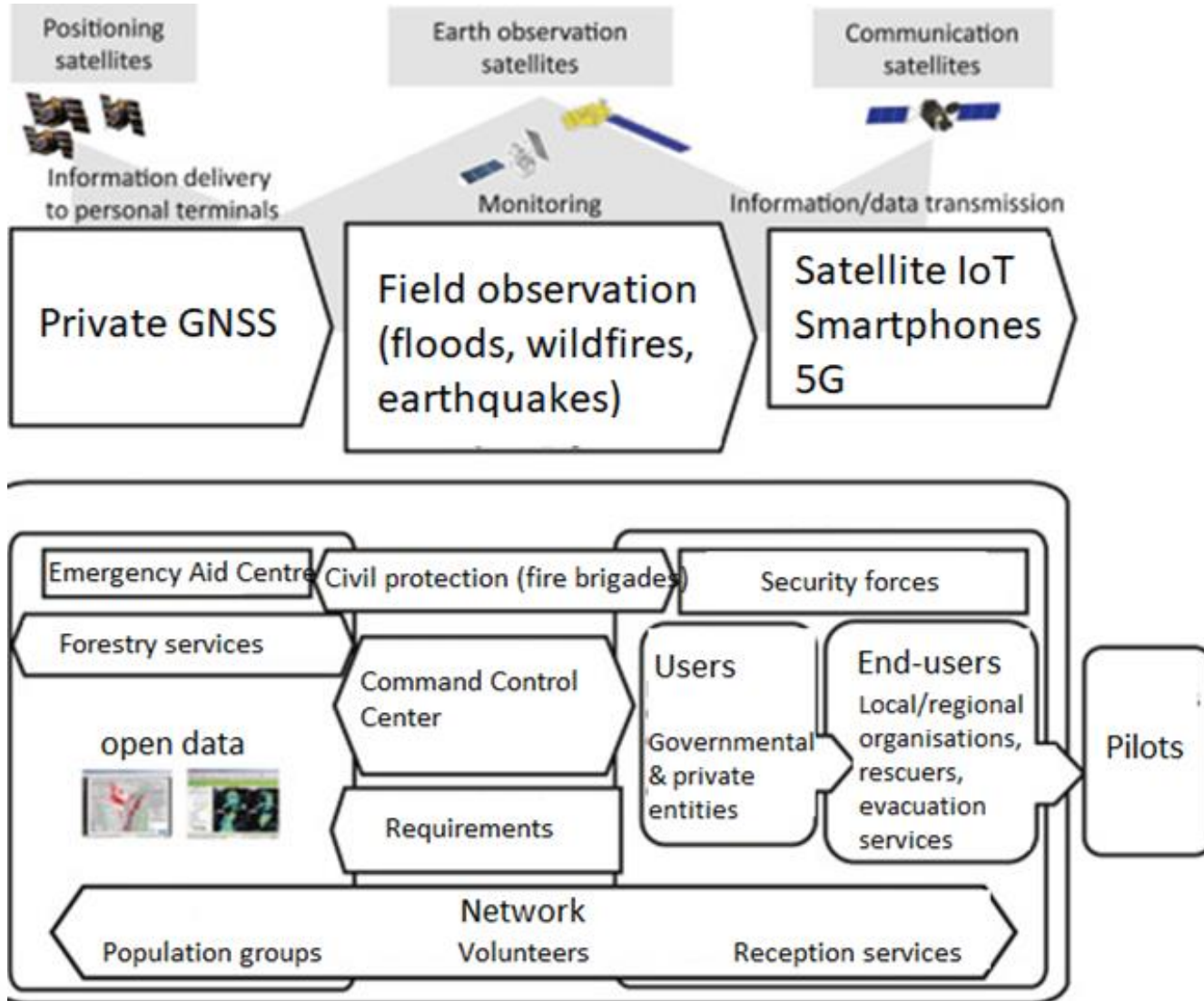
ISLA-FED

ISLA-FED
Short Description

- ➤ A Satellite IoT system integrated with smartphones to leverage existing technologies such as (drones, AI, and sensors) and communication technologies to support first and second responders in their immediate response to natural disasters

- ➤ Development of a secure and tamper-proof system for tracking and managing the data generated by the IoT devices and sensors using blockchain technology, to ensure data privacy and security, creating immutable records and automating the management of emergency response workflows

Expected outcomes

- Identification and evaluation of existing technologies supporting first and second responders in their immediate response to natural disasters, highlighting strengths and weaknesses, through continuous monitoring with accuracy and availability of near real-time data using Satellite IoT devices

- Testing and implementation of promising technologies in real-world conditions with reliable coverage while consuming low power (satellite networks provide coverage where traditional networks will struggle or fail)

- Accurate prediction and rapid assessment of disaster locations and extent of damage to prevent massive devastation

68

Mrs Konstantina Koutsiara – koutsiara@blockchain2050.io

Project participants

- Existing consortium:
  - Proposed coordinator: *BC2050*
  - Partners / Other participants: *Technical & technological universities, EO experts, SATCOM solution providers, municipalities within EU*
- Looking for partners with the following expertise/ technology/ application field:
  - *First responders vehicles – logistics*
  - *Drone-providers*
  - *Authorities of disaster response from at least 3 different EU Member States*
  - *Standardisation organisations*
  - *SSH partners*
  - *Other?*

Mrs Konstantina Koutsiara – koutsiara@blockchain2050.io

DRS-01-06

Increased technology solutions, institutional coordination and decision-suport systems for first responders of last-kilometer emergency service delivery

#	Organisation	Presenter
15	CEA	Antonin Galtier

TECH4RESPONDERS

- *jean-philippe.poli@cea.fr* / *antonin.galtier@cea.fr*
- CEA – French alternative Energies and Atomic Energy Commission
- Role: Coordinator

- <u>Proposal activity</u>: **HORIZON-CL3-2023-DRS-01-06**: Increased technology solutions, institutional coordination and decision-support systems for first responders of last-kilometer emergency service delivery (RIA, 3.5M€)
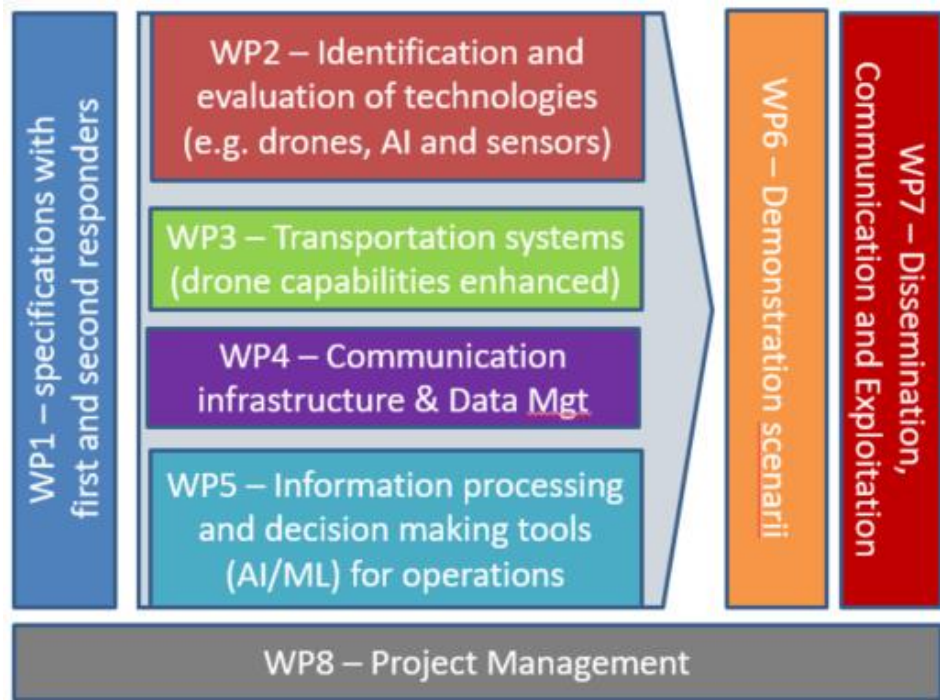
- <u>Scope</u>:
  - items delivery
  - ability to obtain critical information remotely about the extent, perimeter, or interior of the incident as well as conduct on-scene operations remotely without endangering responders.
  - For example, technology solutions for navigation in smoky environments in the case of wildfires.

1

Technologies for deeply enhanced operations of first responders

- *First focus on the needs of first responders for different typical scenario (e.g. natural disaster or incidents) in collaboration with firefighting, medical emergency and police forces.*

- *Technologies: Identify and evaluate the different necessary technologies (e.g. drones, AI, sensors)*

- *Transportation systems: Increase drone capabilities and interfaces for piloting and operations)*

- *Communication: data sharing, security, reliability*

- *Decision making tools: Information processing and sharing for operation enhancement*

- *Demonstration according to scenarii*

WP1 – specifications with first and second responders

WP2 – Identification and evaluation of technologies (e.g. drones, AI and sensors)

WP3 – Transportation systems (drone capabilities enhanced)

WP4 – Communication infrastructure & Data Mgt

WP5 – Information processing and decision making tools (AI/ML) for operations

WP6 – Demonstration scenarii

WP7 – Dissemination, Communication and Exploitation

WP8 – Project Management

antonin.galtier@cea.fr

Project participants

- Existing consortium:
  - Proposed coordinator: **CEA**
  - first responders' organisations or agencies : HCFRN (the High French Committee for National Resilience)
  - Partners: Thalès (FR), Resalliance (FR), CERTH (GR), INESC TEC (P)
- Looking for partners with the following expertise/ technology/ application field:
  - First and second responders' organisations or agencies
  - Drones and Sensors

- *Reference project RESPONDRONE (2019-2022)*

Fleet of drones for first responders

https://respondroneproject.com/

DRS-01-06

Robotics: Autonomous or semi-autonomous UGV systems to supplement skills for use in hazardous environments

#	Organisation	Presenter
16	German Federal Agency For Technical Relief (THW)	Nils Krippner

RESCUED - Remote Emergency Sensor-Based Control, Unmanned Exploration and Delivery

- *Nils Krippner*

- *Nils.Krippner@thw.de*

- *German Federal Agency for Technical Relief (THW)
  CP Agency, national and international ops,
  H2020 & HE experienced*

- Role: WP leader, Practitioner, Practitioner Coordinator

- Proposal activity: CL3-2023-DRS-01-06
  Increased technology solutions, institutional coordination and
  decision-support systems for first responders of last-kilometer
  emergency service delivery

Proposal idea/content

- The RESCUED-project aims to **improve the operational strengths of disaster relief organisations through the use of new technologies such as drones, AI and sensors**. It involves **identifying and evaluating existing technologies** and testing promising user-oriented solutions in real-life conditions to improve operations in smoky environments, such as forest fires. **Key information will be made available** to first and second responders remotely, enabling effective operations on the ground without endangering their lives. In this context, **last-mile logistical problems** that hinder the delivery of relief supplies to disaster-prone areas are also overcome.

76

Proposal idea/content

Project participants

- Existing consortium:
  - Proposed coordinator: *tbd.*
  - Partners / Other participants:
    - German Federal Agency for Technical Relief

- Looking for partners with the following expertise/ technology/ application field:
  - ≥ 3 first responders` organisations
  - Representatives of local or IDRM regional authorities from ≥ 3 EU countries or associated countries

DRS-01-06

Increased technology solutions, institutional coordination and decision-support systems for first responders of last-kilometer emergency service delivery

#	Organisation	Presenter
17	Enide	Radivoj Malić

TECHSupport4NDRr

(Natural Disaster Response and Recovery)

- *Radivoj Malić*
- radivoj.malic@enide.com
- *ENIDE Solutions (Barcelona, Spain)*
- Role: *<Proposal partner, WP leader, Tech provider>*

- <u>Proposal activity:</u>
- <u>Call: Call</u>
- <u>Disaster-Resilient Society 2023</u>
- <u>Topic: HORIZON-CL3-2023-DRS-01-06</u>: Increased technology solutions, institutional coordination and decision-support systems for first responders of last-kilometer emergency service delivery
  - Type of Action: RIA
  - Deadline: **23 November 2023**

80

Proposal idea/content

- Supporting first (and second) responders for enhanced response to natural disasters
- Development, testing and implementation of **Decision Support Systems** technologies to support FRs, based on:
  - Telecom data
  - AI for forecasting
  - Surveillance cameras data analyses
  - Alternative data source very welcome (additional use case or addition to existing)
- Improving Disaster Resilience
- More details available on request to potential candidates

Radivoj Malić; radivoj.malic@enide.com

Project participants

- *Proposal stage: advanced (key consortium exists; writing ongoing)*

- Existing consortium:
  - *Telecom operators, Industry (including SMEs), Research/Academic Partners from Spain, Italy, Finland, Belgium, Turkey.*

- Looking for partners with the following expertise/ technology/ application field:
  - ***Additional First/Second Responders:*** *Fire fighters, medical teams; search and rescue (ideally from countries other then Italy, Spain and Turkey (FRs from those countries*
  - ***Additional Research/Academic Partners*** *(preferably from countries not already involved; but not restricted);*
  - ***Drones experts*** *(able to navigate in low visibility: e.g. smoky environments)*
  - **Last-kilometer emergency service delivery experts** (emergency logistics)
  - **Wildfires response experts** (from EU)

Radivoj Malić; radivoj.malic@enide.com

Thank you for your attention!

- If you see your organization fit to our project idea, please don´t hesitate to get in touch (please outline the specific role/contribution).

Radivoj Malić;

radivoj.malic@enide.com

DRS-01-06

Increased technology solutions, institutional coordination and decision-support systems for first responders of last-kilometer emergency service delivery

#	Organisation	Presenter
18	Fraunhofer EMI	Dr. Ivo Haering

Automated search and rescue concept for buried people after heavy building damage or building collapse
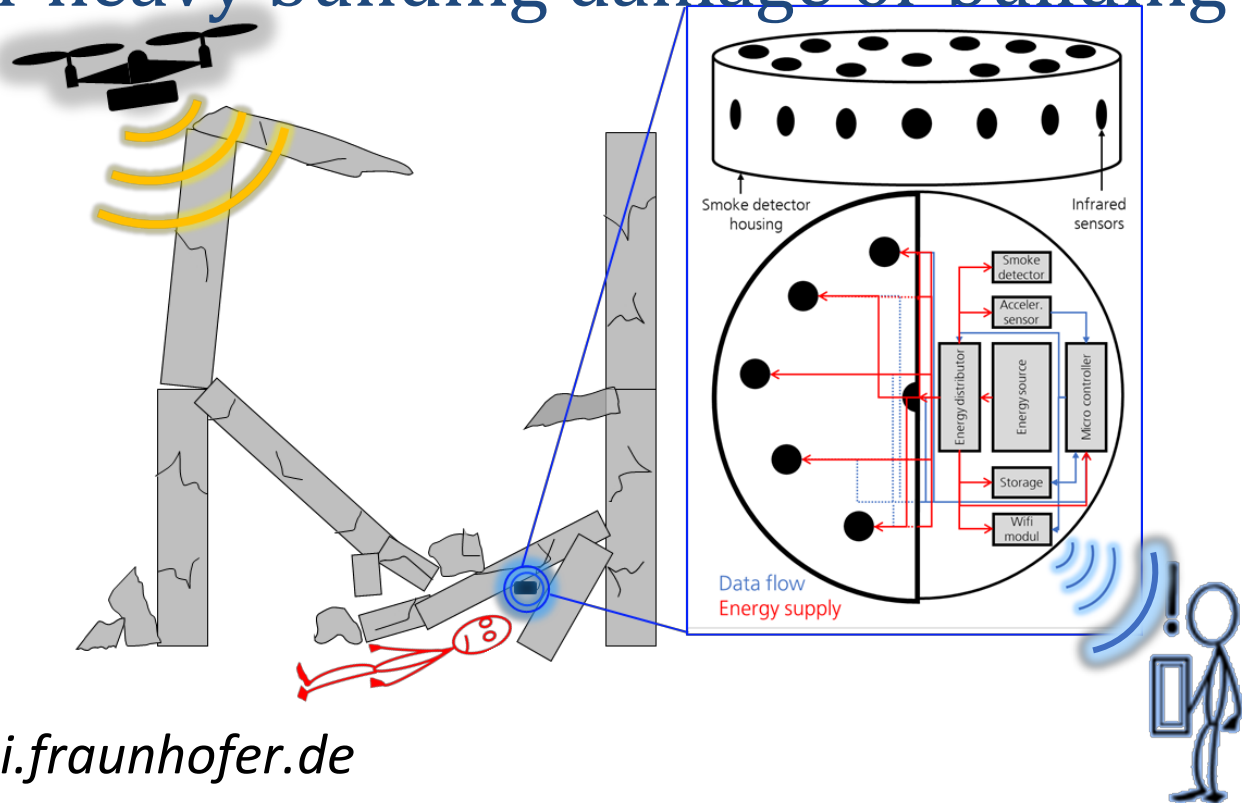
Dr. Julia Rosin

julia.rosin@emi.fraunhofer.de

Fraunhofer-Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI, Germany

Role: WP leader

Proposal activity: *HORIZON-CL3-2023-DRS-01-06*

85

Automated search and rescue concept for buried people after heavy building damage or building collapse

- (1) Development of country-specific building catalogs with representative buildings and their typical collapse damages

- (2) Drone-based scan of damaged area → exact overview of the affected area with number and type of heavy damaged or collapsed buildings

- (3) Multifunctional sensor unit for automated and fast detection of buried people → location and number of buried people

→ (3) provides information for immediate activity of first responder

→ Combination of (1), (2), (3) provides the basis for the ad-hoc set-up of a site-specific but also disaster area-wide SAR operation

- Fast reaction since information of (1) and (3) is available immediately after disaster, (2) will be available very quickly

- Overarching operational organization according to demand

Julia Rosin, julia.rosin@emi.fraunhofer.de

Contribution of Fraunhofer EMI

- *Building collapse simulation of representative buildings*
- *Multifunctional sensor unit for automated and fast detection of buried persons under building debris (see figure)*
  - *If a building collapse is registered, information about the presence of persons is sent to the outside*
  - *With a smartphone this information can be evaluated to locate the persons buried under the building debris*
  - *Patent: US20220246016A1, EP4036885A1*

Julia Rosin, julia.rosin@emi.fraunhofer.de
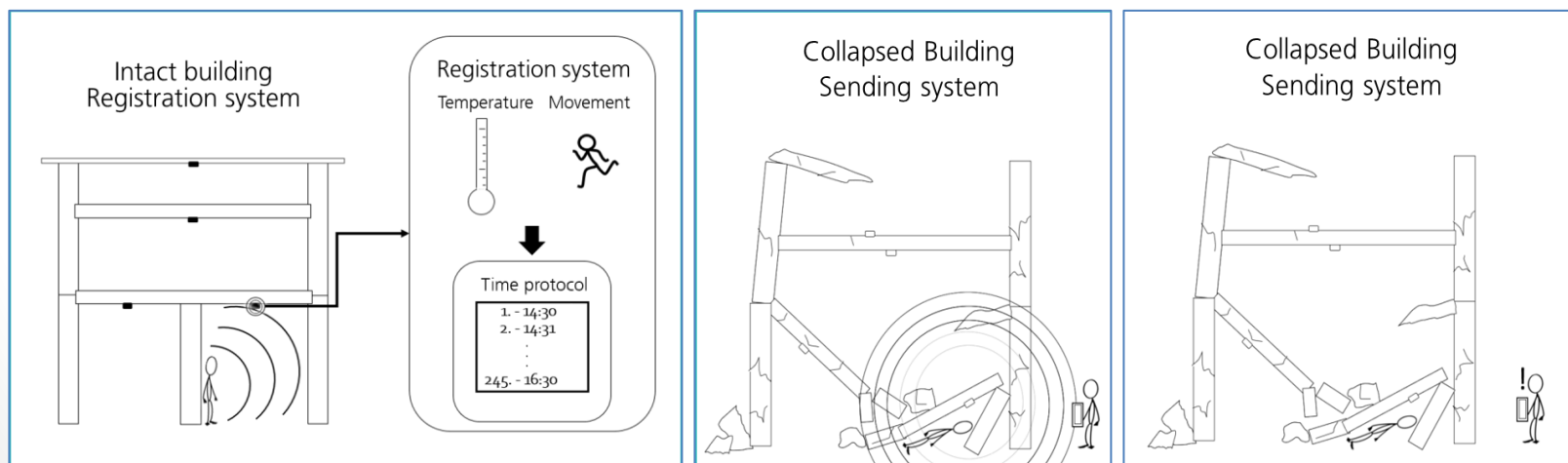
Project participants

- Looking for partners to create a consortium or to join a matching one

- Looking for partners with the following expertise/technology/ application field:

  - *Technical engineering company or research institute with ambition to manage consortium*

  - *Companies that are interested in developing the multi-sensor unit (sensor-based building security, manufacturers of smoke and fire detectors or surveillance technology, sensor technology)*

  - *Drone scan of buildings and post-processing of scans*

  - *First responder*

  - *Disaster management authorities, (municipal) administration*

  - *Construction companies with experience in simulating building collapses of country-specific building types*

Julia Rosin, julia.rosin@emi.fraunhofer.de