

Have you ever wondered how the next generation rescuers' life can become easier on the operation field?



RESCUER



first RESponder-Centered support toolkit for operating in
adverse and infrastrUcture-less EnviRonments –
“The case of mountain rescue scenario”

DIMITRIOS ILIADIS¹, VASSILEIOS DOVAS¹, IOSIF VOURVACHIS¹

¹ HELLENIC RESCUE TEAM, (GREECE)



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The Project

RESCUER tools and systems will **enhance the senses** of first responders, **aid the localization** of both themselves and victims, and **improve their situational awareness** through smart processing and AR visualizations.

RESCUER tools focus on the case of **adverse conditions** and/or **lack of infrastructure**, relying only on **hardware carried** by the first responders themselves.



The Goal

RESCUER aims to:

- create and develop a **technology toolkit** with a First Responder focus.
- equip **the upcoming group** of first responders.
- enhancing the **effectiveness** and **safety** of their operations.
- especially **under tough** circumstances.
- **both** in terms of infrastructure and the environment.



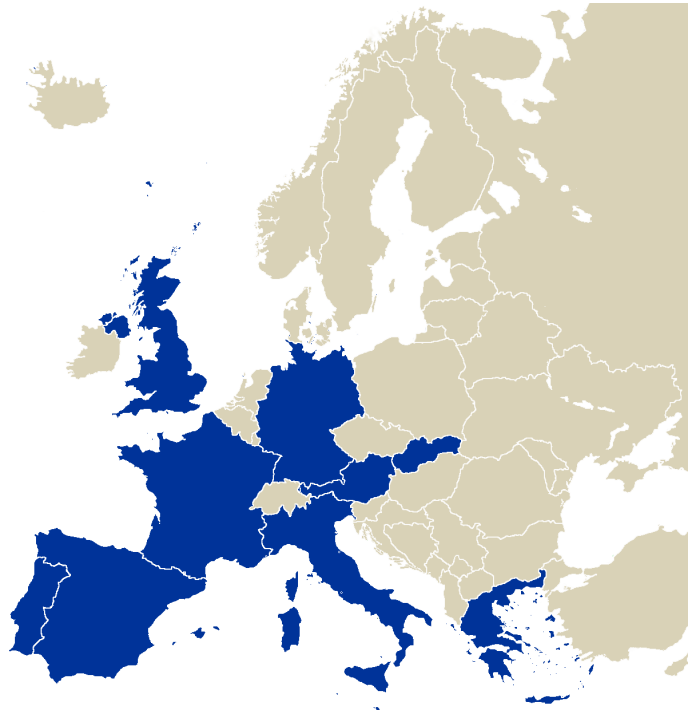
“HERO” (enHanced nEw eRa first respOnder) concept, will deliver a toolkit offering:

1. **Sense augmentation**
2. **Precise and infrastructure-less self-positioning**
3. **Cognitive support** and multi-sense AR interfaces
4. **Robust ad-hoc intra-team communications** for both verbal and data exchanges



The Consortium

20 partners from:



- Spain
- Italy
- France
- Greece
- Germany
- United Kingdom
- Portugal
- Slovakia
- Austria

9 research institutes

6 end-users

3 SMEs

1 large enterprise

1 ICT company

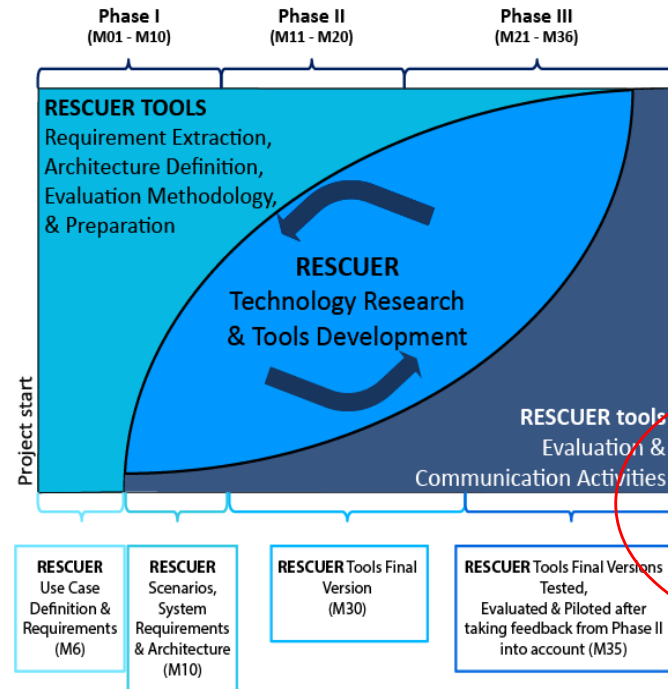


The Roadmap



Duration: 36 months
(July 2021 – June 2024)

- Three phases
 - Initial development
 - Core development
 - Maturation Phase



Phase I:

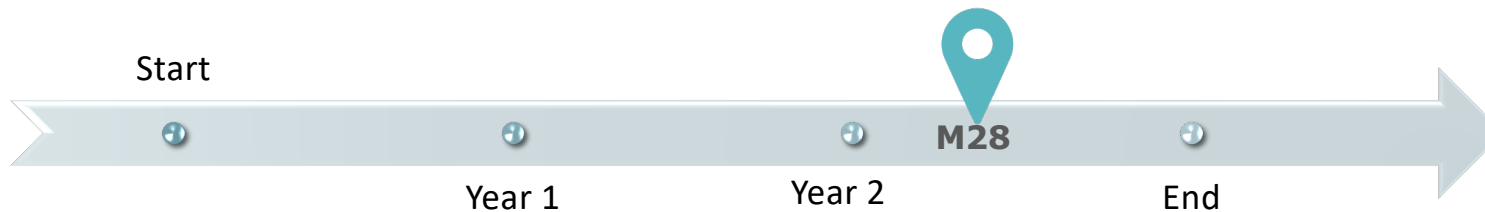
- Use Case Tools' Requirements & Scenarios
- Tools' Architecture & Module Specification
- Technology Research
- Preliminary Modules & Tools Development

Phase II:

- Technology Integration
- 1st Version of RESCUER Edge Tools
- Technical Validation, Testing & Optimization
- Usability & Performance Analysis
- 1st Pilots

Phase III:

- Pilot & First Responders Feedback
- Final Versions of RESCUER Edge Tools
- Technical Validation, Testing & Optimization
- Usability & Performance Analysis
- Final Pilots
- First Responder Feedback & Policy Recommendations



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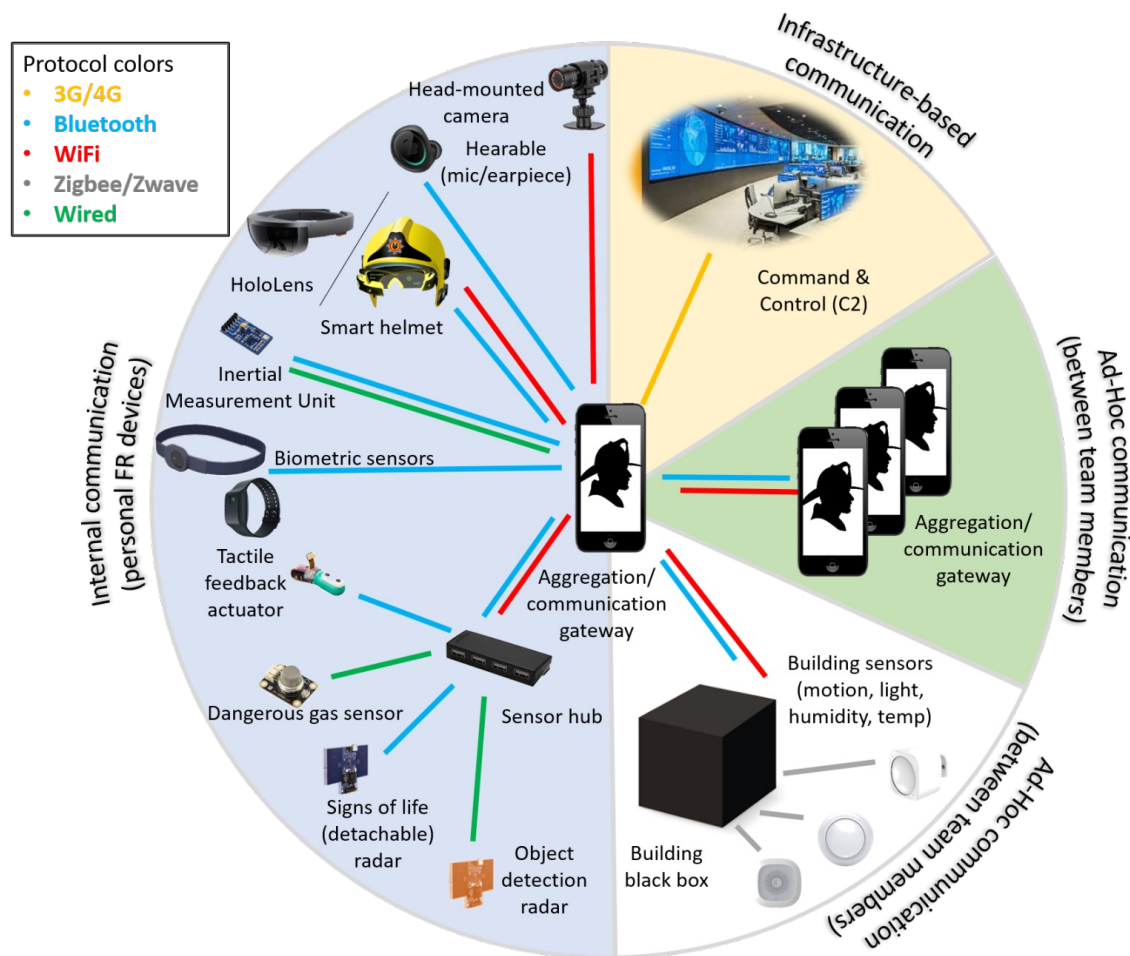
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The Tools

Three pillars

- Infrastructure based communication
- Ad-hoc communication
- Internal Communication



Pilots overview

- Two pilot cycles
 - 1st pilot after the 1st version of the tools
 - 2nd pilot after the final tool versions

Country	Scenario	1 st PILOT	2 nd PILOT
GERMANY	Earthquake	November 2022	April 2024
FRANCE	Tunnel fire	October 2023	May 2024
SPAIN	Mountain rescue	January 2023	March 2024

- Field trials during tool development
 - Before pilots for several testings
 - Already executed in:
 - Greece
 - Germany
 - Spain
 - France

- 1st pilot cycle goal

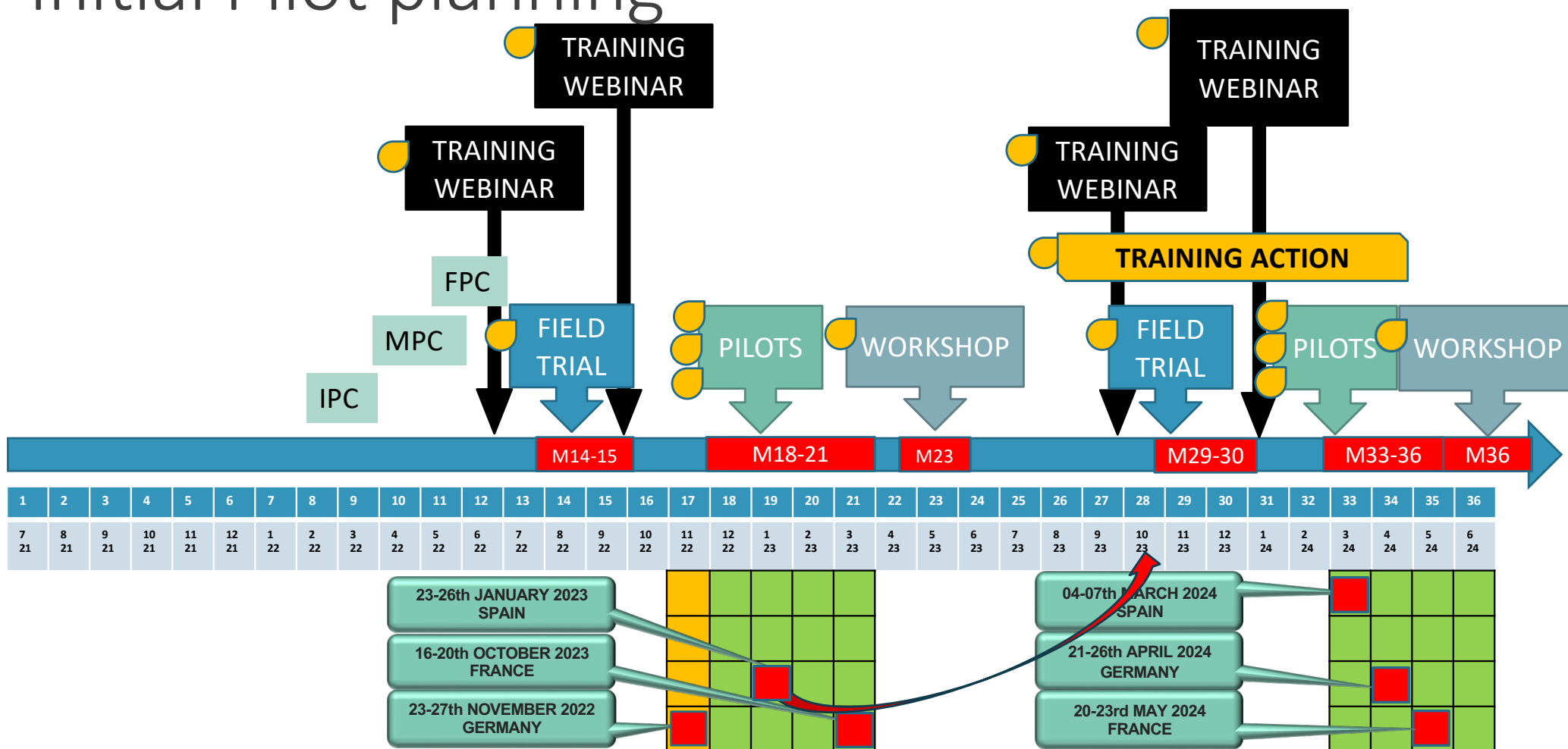
- Technical verification and validation
- Requirements will be re-targeted to address the end-user needs

- 2nd pilot cycle goal

- Refined results and feedback
- Final version of tools

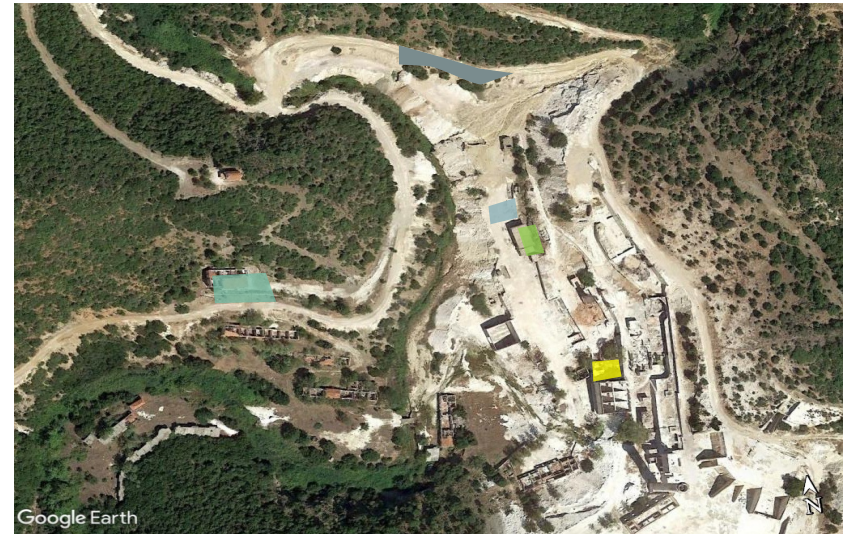
The execution of this phase will be formulated as **policy outcomes and a set of recommendations.**

Initial Pilot planning



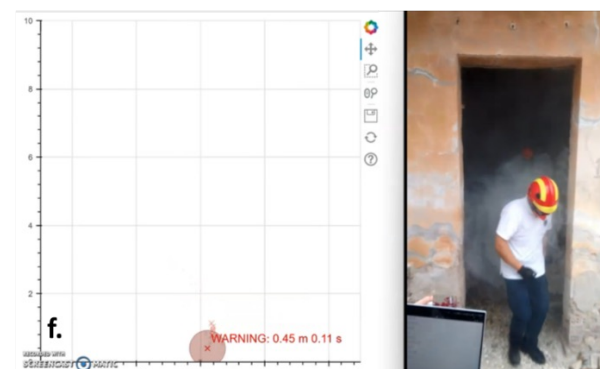
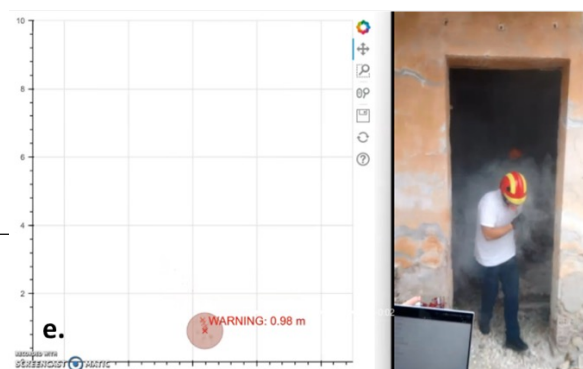
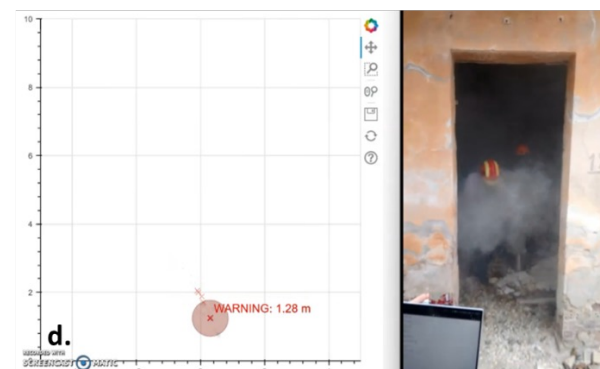
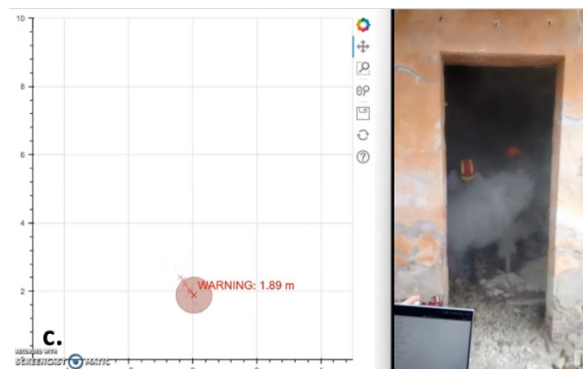
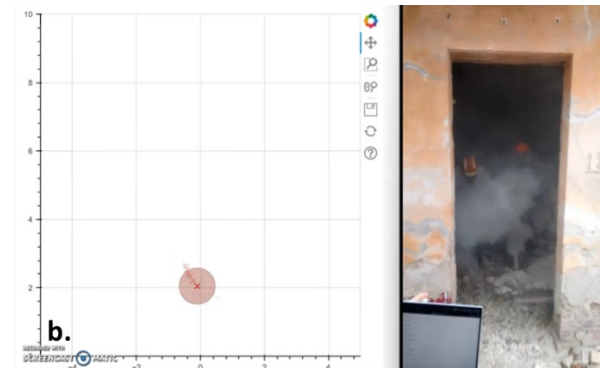
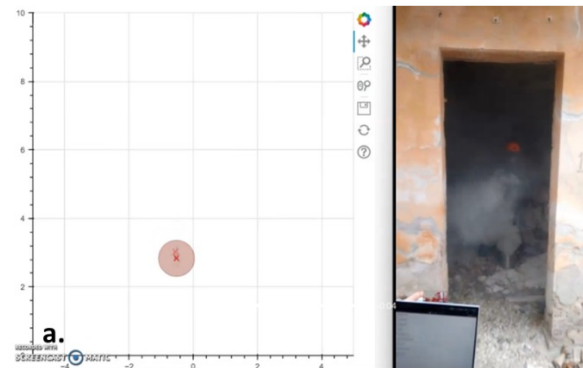
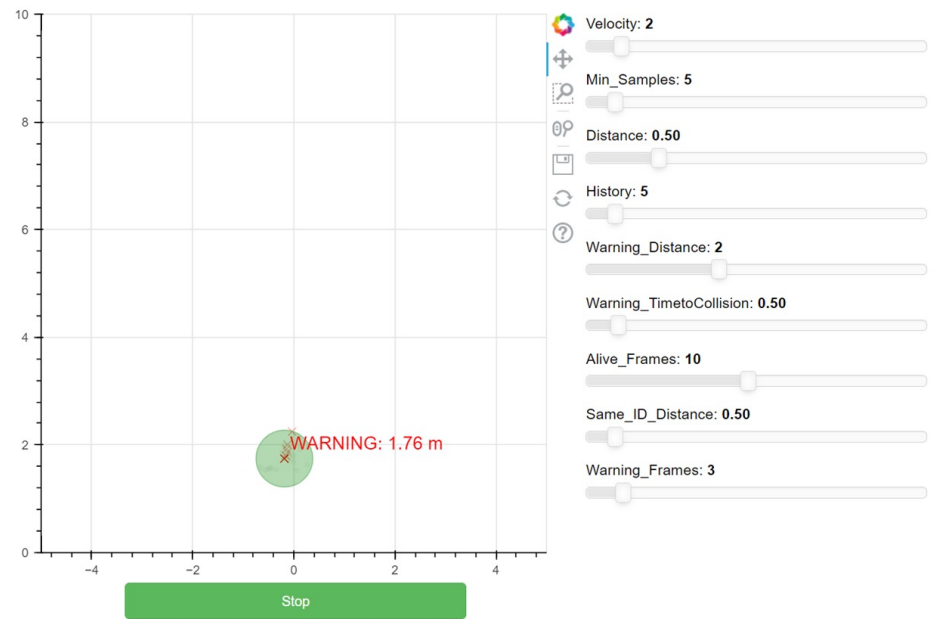
Field trial in Greece

- First in-field testing
- Old mine of Vavdos, Chalkidiki
- 18th of June 2022
- Technical partners and End-users
 - Urban Search & Rescue Department of Hellenic Rescue Team (HRT)
 - Center for Research & Technology Hellas (CERTH)
 - University of West Attica
- Earthquake scenario
 - INSARAG 2020 Guidelines, Volume 2: Preparedness and Response's



Trial results

The radar sensing tool



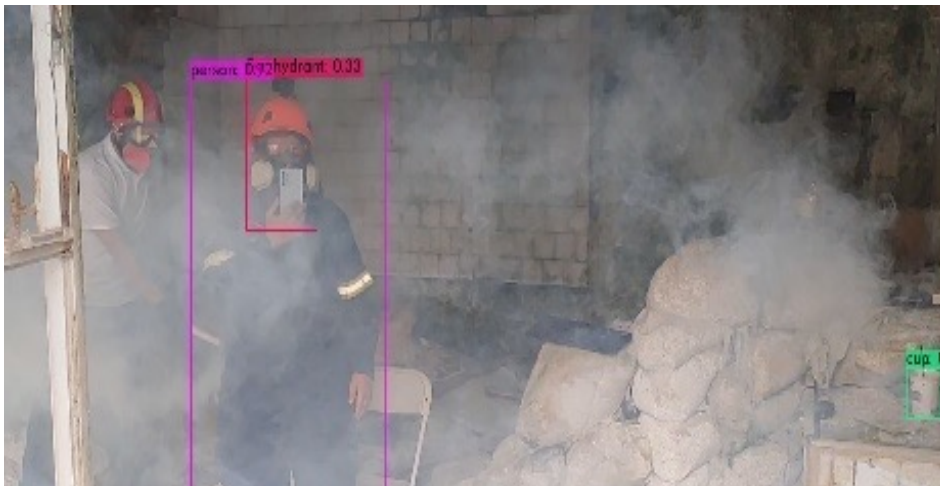
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Trial results

The Robust vision tool



Object detection in smoke: without dehazing pre-processing



Object detection in smoke: with dehazing pre-processing



Use case 1: Earthquake



Weeze / Germany



23-27.11.2022



Scenario objective:

- Test and Evaluation of the RESCUER Tools within an **Earthquake Scenario** with **Collapsed and Damaged Buildings** during ASR 2 and ASR 3 Activities.
- Test of the Improvement of the **Safety** of the First Responders as well as the **Efficiency** (Time Saving) within a Realistic Scenario.



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Use case 1: Earthquake



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Use case 1: Earthquake



Use case 2: Tunnel fire



Modane, France



27-31.03.2023 reported to
20.10.2023



Scenario objective:

Test and Evaluation of
the RESCUER Tools within a
**Tunnel accident and fire
Scenario**



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Use case 2: Tunnel fire



Use case 3: Mountain rescue



Navacerrada, Spain



23-27.01.2023



Scenario objective:

Test and Evaluation of
the RESCUER Tools within
a **Mountain Rescue Scenario**
with a **Search and Rescue at
the mountains**

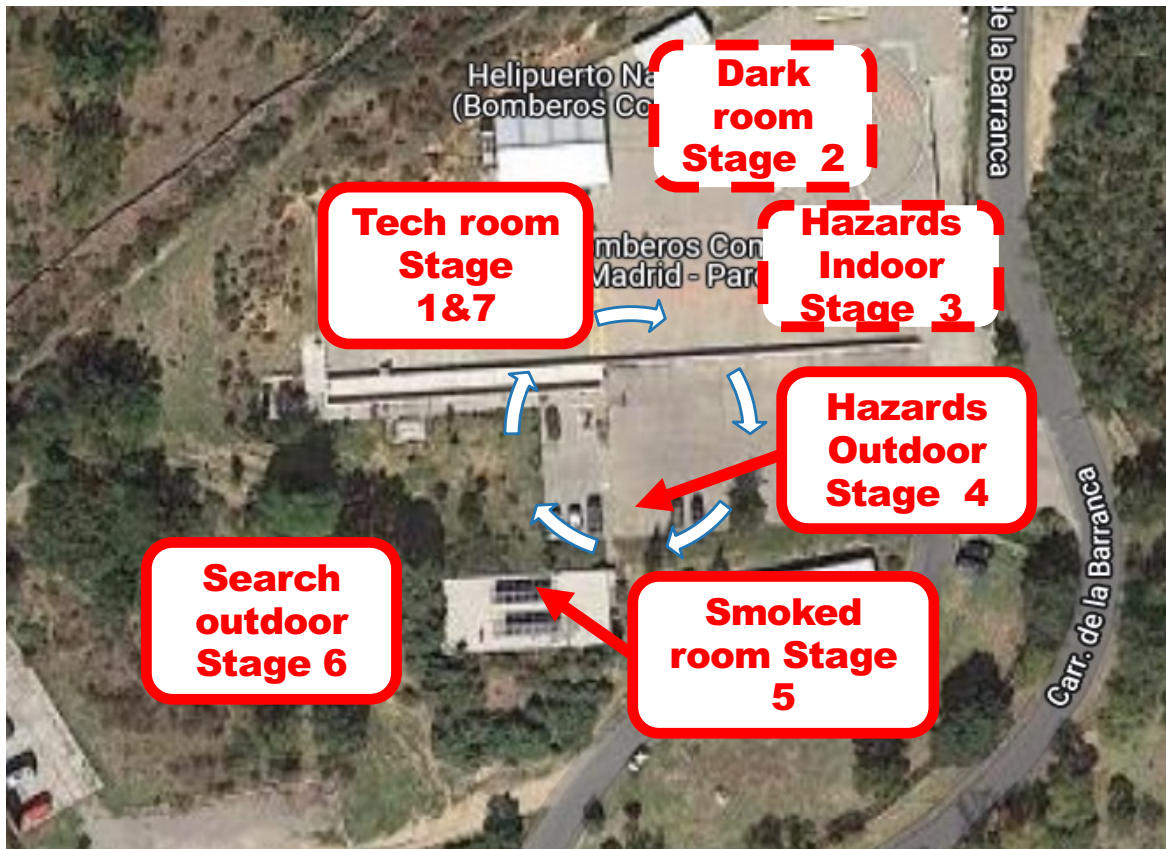


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1st site of test: Navacerrada Fire Station



- 6 rooms
- 7 Stages to test different tools
- Rotation system
- 50 minutes per session



2nd site of test: Valdesqui ski center



- De-snowing Algorithm in day conditions
- Person detection with Helmet (max. distances)
- AR Interfaces with HoloLens
- Test Wi-Fi finder (maximum distances) at snow
- GPS localization
- Bio signals monitoring
- Voice commands communication

Use case 3: Mountain rescue

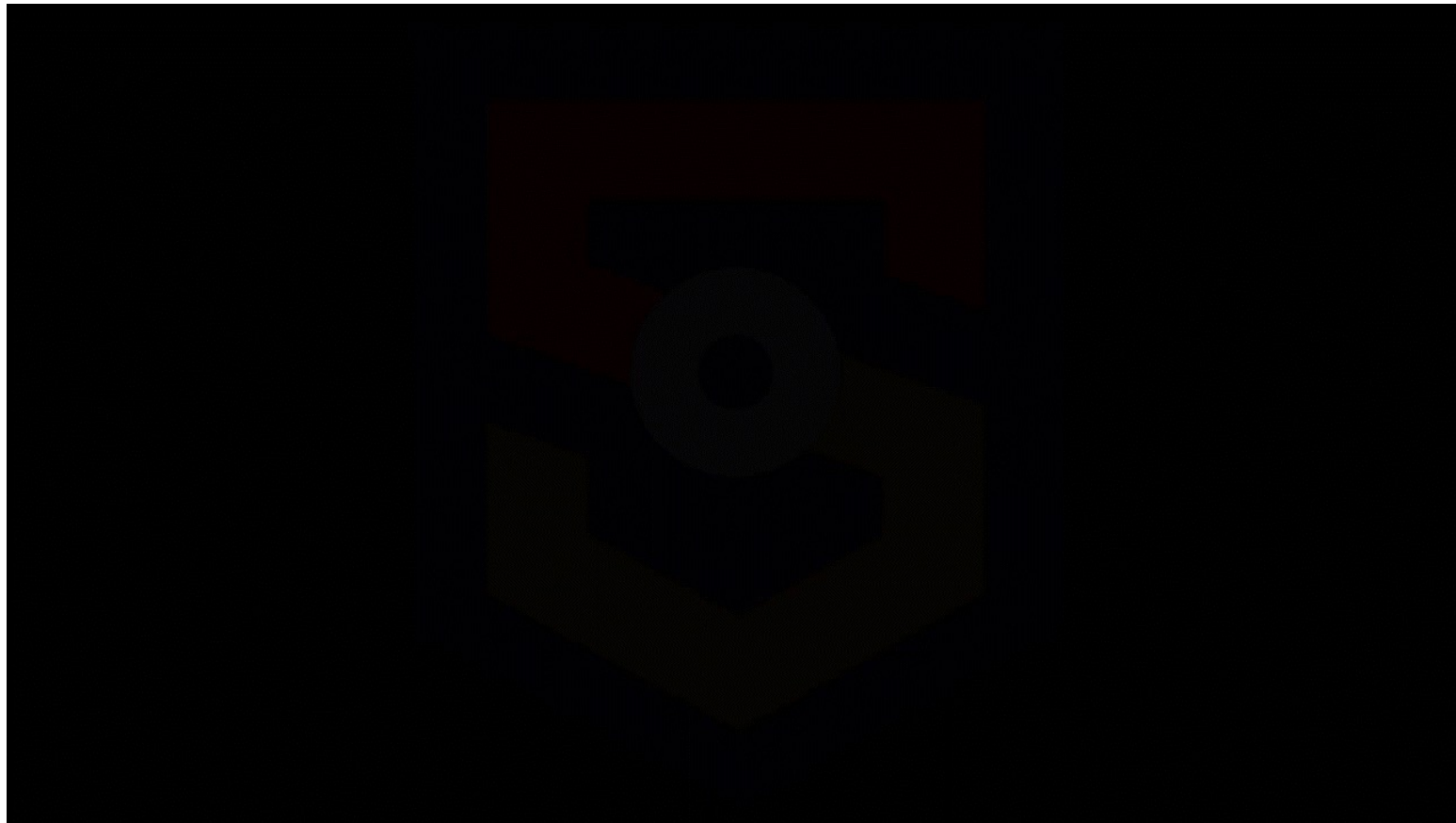


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Use case 3: Mountain rescue



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Tools in Pilots overview

TOOL	EARTHQUAKE	TUNNEL FIRE	MOUNTAIN
Smart Helmet	Y	Y	Y
Robust Vision	Y	Y	Y
Visual based self-localization	Y	Y	Y
Enhanced hearing	P	P	N
Augmented olfaction	N	Y	N
Radar sensing and remote touching	Y	Y	N
Signs of life detection	N	Y	N
Data sharing orchestration	Y	Y	Y
INERTIO	Y	Y	Y
Galileo assisted localization	N	Y	Y
Biosignals monitoring	Y	Y	Y
Augmented Reality Interfaces	P	Y	Y
Wireless Finder	Y	P	Y
EBBBB	Y	Y	N
WANET	Y	Y	Y
Seamless communication with C2	P	Y	N
C2 Interface (including Mission Recorder)	P	Y	N

➤ Almost **all** RESCUER Tools were Tested within the first round of pilots as Stand-Alone Tools.

➤ The majority was tested in the mountain scenario

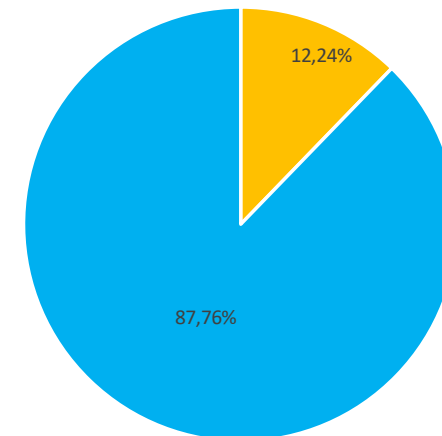
- Y = Yes
- N = No
- P = Partially



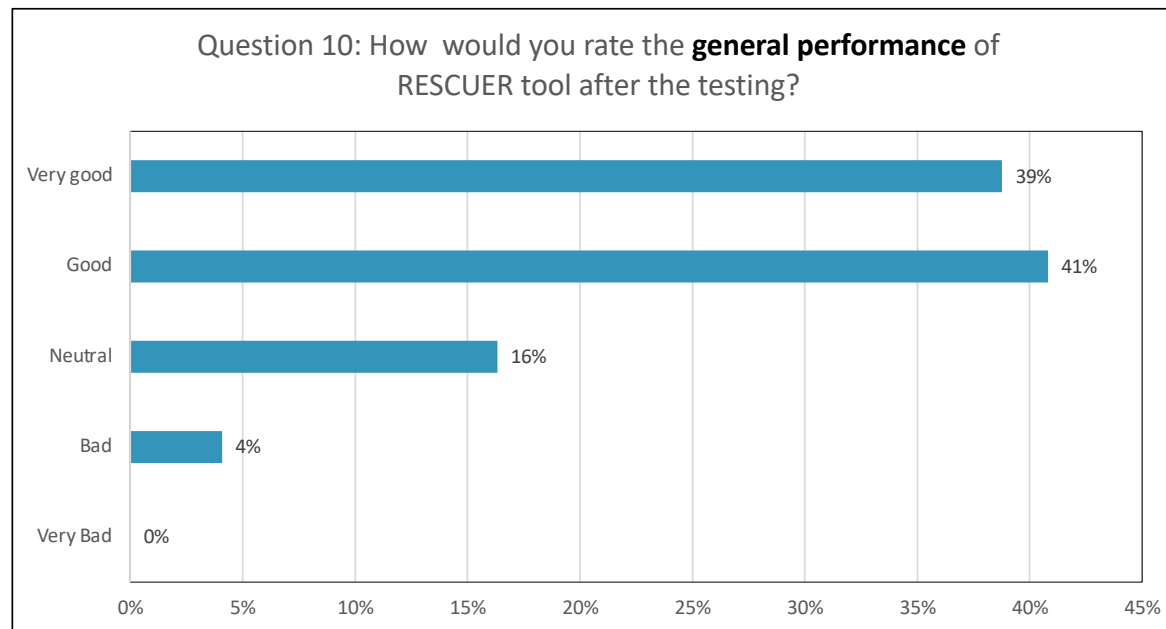
Use case 3: Results

3. Was the RESCUER tool usable during testing?	Number	Percent
No	0	0,00%
Yes	49	100,00%
	49	100,00%

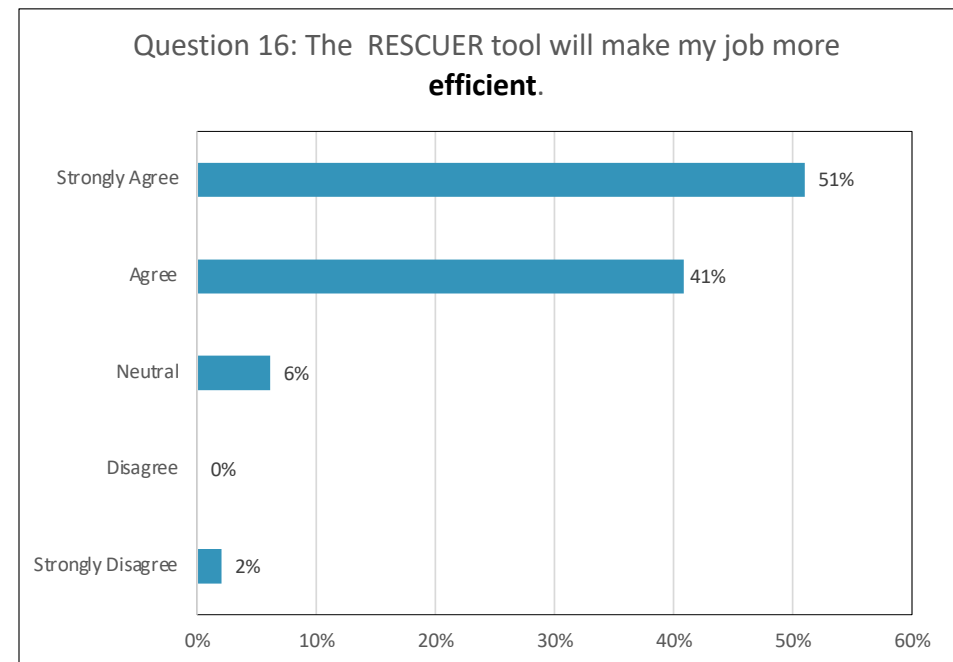
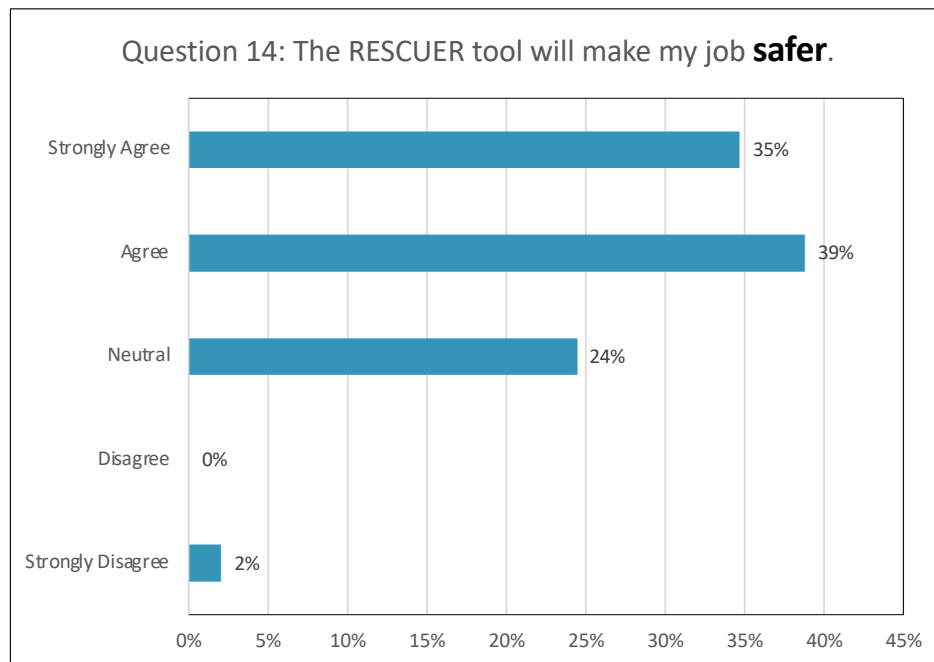
Question 5: Was the whole functionality of the RESCUER tool **usable**?



■ No, only parts were usable during the test. ■ Yes



Use case 3: Results



Questions

Should you have any more questions, please
email us at:

<https://rescuerproject.eu/contact/>



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