

Proposal Evaluation Form



EUROPEAN COMMISSION

Horizon Europe (HORIZON)

Evaluation Summary Report - Research and innovation actions

Call: HORIZON-CL4-2022-DATA-01
Type of action: HORIZON-RIA
Proposal number: 101093003
Proposal acronym: TEMA
Duration (months): 48
Proposal title: Trusted Extremely Precise Mapping and Prediction for Emergency Management
Activity: HORIZON-CL4-2022-DATA-01-01

N.	Proposer name	Country	Total Cost	%	Grant Requested	%
1	ARISTOTELIO PANEPITIMIO THESSALONIKIS	EL	1,381,875	12.00%	1,381,875	12.19%
2	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	DE	1,384,687.5	12.03%	1,384,688	12.21%
3	ENGINEERING - INGENIERIA INFORMATICA SPA	IT	750,000	6.51%	750,000	6.61%
4	ATOS IT SOLUTIONS AND SERVICES IBERIA SL	ES	321,500	2.79%	321,500	2.84%
5	ATOS SPAIN SA	ES	60,000	0.52%	60,000	0.53%
6	UNIVERSIDAD DE SEVILLA	ES	900,500	7.82%	900,500	7.94%
7	TECNOSYLVA SL	ES	498,750	4.33%	498,750	4.40%
8	Northdocks GmbH	DE	499,375	4.34%	499,375	4.40%
9	PARIS-LODRON-UNIVERSITAT SALZBURG	AT	706,500	6.14%	706,500	6.23%
10	THE LISBON COUNCIL FOR ECONOMIC COMPETITIVENESS ASBL	BE	537,500	4.67%	537,500	4.74%
11	LATITUDO 40 SRL	IT	426,875	3.71%	426,875	3.76%
12	Nelen & Schuurmans Technology BV	NL	498,750	4.33%	498,750	4.40%
13	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV	DE	1,186,112.25	10.30%	1,013,036	8.93%
14	UNIVERSITA DEGLI STUDI DI MESSINA	IT	586,750	5.10%	586,750	5.17%
15	KAJAANIN AMMATTIKORKEAKOULU OY	FI	536,750	4.66%	536,750	4.73%
16	KAJAANIN KAUPUNKI	FI	253,375	2.20%	253,375	2.23%
17	KENTRO MELETON ASFALIAS	EL	320,000	2.78%	320,000	2.82%
18	Dimos Mantoudiou - Limnis - Agias Annas	EL	101,500	0.88%	101,500	0.90%
19	REGIONE AUTONOMA DELLA SARDEGNA*RAS	IT	218,750	1.90%	218,750	1.93%
20	BAYERISCHES ROTES KREUZ	DE	343,750	2.99%	343,750	3.03%
Total:			11,513,299.7	5	11,340,224	

Abstract:

TEMA will greatly improve Natural Disaster Management (NDM, e.g., for wildfires, floods) by automating precise semantic 3D mapping and disaster evolution prediction to achieve NDM goals in near-real-time. It will analyze and fuse many heterogeneous extreme data sources: smart drone and in-situ sensors, remote sensing data, topographical data, meteorological data/predictions and geosocial media data (text, image and videos). TEMA will focus on the extreme nature of the data, due to their varying resolution and quality, very large volume and update rate, different spatiotemporal resolutions and acquisition frequencies, real-time needs and multilingualism. It will develop an integrated, ground-breaking NDM platform, focusing on real-time semantic extraction from multiple heterogeneous data modalities and sources, on-the-fly construction of a meaningful semantically annotated 3D disaster area map, prediction of disaster evolution and improved communication between service providers and end-users, through automated process triggering and response recommendations. Semantic analysis computations will be distributed across the edge-to-cloud continuum, in a federated manner, to minimize latency. Extreme data analytics will be performed in a trustworthy and transparent way, by greatly advancing state-of-the-art AI and XAI approaches. The constantly updated 3D map and the disaster evolution predictions will form the basis for an advanced, interactive, Extended Reality (XR) interface, where the current situation will be visualized and different response strategies will be dynamically evaluated through simulation by NDM personnel. The innovative, scalable and efficient TEMA platform will provide precise NDM support, based on extreme data analytics. It will be validated on two critical disaster use-cases (wildfires and floods), in four EU countries, and will form the basis for the TEMA NDM-Analytics-as-a Service (NDM-AaaS) model.

Evaluation Summary Report

Evaluation Result

Total score: 13.00 (Threshold: 10)

Criterion 1 - Excellence

Score: **4.50** (Threshold: 3/5.00, Weight: -)

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:

- Clarity and pertinence of the project's objectives, and the extent to which the proposed work is ambitious and goes beyond the state of the art.
- Soundness of the proposed methodology, including the underlying concepts, models, assumptions, inter-disciplinary approaches, appropriate consideration of the gender dimension in research and innovation content, and the quality of open science practices, including sharing and management of research outputs and engagement of citizens, civil society and end users where appropriate.

TEMA will develop state-of-the-art technologies for natural disaster management based on real-time, semantic extraction from multiple heterogeneous data modalities and sources, on-the-fly construction of a meaningful semantically annotated area map, near-real-time prediction of phenomenon/emergency evolution, and automated response recommendations.

The proposal is highly pertinent to the call and has clear objectives backed by KPIs. Its objectives are derived from existing challenges in extreme data analytics and from socially relevant use cases, such as regional floods, flash floods and forest fires/wildfires, which is excellent. The focus on trustworthiness of the tools, use of federated techniques, and use of European data sources is welcome. The interoperability of the platform in multiple European countries is a benefit. The ambition to reducing emergency management response times is appreciated.

The work is broad, ambitious, and goes beyond the state of the art. The proposed solutions are robust and could not be achieved by current technologies, specifically in the realm of explainable AI and detecting serious events. This is a strength.

Overall, the methodology is excellent, as it is detailed and sound. The proposal demonstrates a strong understanding of semantic analysis, edge computing, model-based AI, extended reality visualization techniques, and near real-time phenomenon modeling. Privacy is considered adequately. However, a pilot study for real-time disaster events, given that this is a major use case, is missing. Additionally, the proposal does not describe specific simulation engines in as much detail as other methods and techniques.

Open science practices are given adequate consideration, although the proposal does not give sufficient details on how its aims in open source software would be hampered by partners' exploitation plans.

The gender dimension, though not mandatory, is excellent.

Criterion 2 - Impact

Score: **4.00** (Threshold: 3/5.00 , Weight: -)

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:

- **Credibility of the pathways to achieve the expected outcomes and impacts specified in the work programme, and the likely scale and significance of the contributions from the project.**
- **Suitability and quality of the measures to maximise expected outcomes and impacts, as set out in the dissemination and exploitation plan, including communication activities.**

The proposal has the potential to bring substantial impact in the area of crisis management. The proposal persuasively argues that the work has a high likelihood of reaching the expected impacts of this call. The sheer number of improvements proposed at different stages inspires confidence in positive impact. Additionally, the methods developed in the proposed work might be useful outside of the emergency management domain. For instance, the explainable AI methods could be used for explaining AI in many different circumstances, such as image recognition algorithms of other multi-modal tasks.

However, the proposal does not quantify the extent of the impact of their solution. Specifically, it does not propose the number of disasters per year that could benefit from the software. Moreover, the proposal does not sufficiently address the possibility of unexpected negative impacts resulting from the use of autonomous drones, such as increasing extra-legal surveillance. These are shortcomings.

The proposed work offers a clear path to increase the TRLs of several technologies (decision support, response planning, etc.) to 4 or 5 from lower, well-specified readiness levels.

The communication and dissemination activities are convincingly specific. The exploitation plan is largely driven by the individual partner's exploitation plans and use cases, but since the proposal has such well-specified and highly relevant target users (e.g., civil protection agencies and first responders), this is not a problem.

Criterion 3 - Quality and efficiency of the implementation

Score: **4.50** (Threshold: 3/5.00 , Weight: -)

The following aspects will be taken into account, to the extent that the proposed work corresponds to the description in the work programme:

- **Quality and effectiveness of the work plan, assessment of risks, and appropriateness of the effort assigned to work packages, and the resources overall.**
- **Capacity and role of each participant, and the extent to which the consortium as a whole brings together the necessary expertise.**

The work plan is of high quality and would be effective. Timing, tasks, deliverables and milestones are detailed and coherent.

Work packages are aligned with each other. The resources are mostly well-calibrated, considering the extent of the proposed work and research.

The risks are appropriately identified and assessed, and the mitigation plans are thorough. The proposal even proposes innovations for mitigating the risk of data scarcity, which is impressive. The discussion of the risk of being unable to meet real-time requirements is appreciated as well. However, some risks are not addressed. For instance, the proposed simulator might inadequately represent the simulated environment because of the chosen architecture.

The makeup of the consortium is broad, well-justified and sufficient to carry out the proposed work. It brings scientific and technical know-how and builds on work that has been previously developed by the members of the consortium. The integration of the end-users into the consortium is much appreciated and is likely to positively impact the project's outcomes. In addition, the consortium plans to use their expertise and contacts in the field to augment the public datasets with private internal datasets.

Scope of the application

Status: **Yes**

Comments (in case the proposal is out of scope)

Not provided

Exceptional funding

A third country participant/international organisation not listed in [the General Annex to the Main Work Programme](#) may exceptionally receive funding if their participation is essential for carrying out the project (for instance due to outstanding expertise, access to unique know-how, access to research infrastructure, access to particular geographical environments, possibility to involve key partners in emerging markets, access to data, etc.). (For more information, see the [HE programme guide](#).)

Please list the concerned applicants and requested grant amount and explain the reasons why.

Based on the information provided, the following participants should receive exceptional funding:

Not provided

Based on the information provided, the following participants should NOT receive exceptional funding:

Not provided

Use of human embryonic stem cells (hESC)

Status: **No**

If YES, please state whether the use of hESC is, or is not, in your opinion, necessary to achieve the scientific objectives of the proposal and the reasons why. Alternatively, please state if it cannot be assessed whether the use of hESC is necessary or not, because of a lack of information.

Not provided

Use of human embryos

Status: **No**

If YES, please explain how the human embryos will be used in the project.

Not provided

Activities excluded from funding

Status: **No**

If YES, please explain.

Not provided

Do no significant harm principle

Status: **Yes**

If Partially/No/Cannot be assessed please explain

Not provided

Exclusive focus on civil applications

Status: **Yes**

If NO, please explain.

Not provided

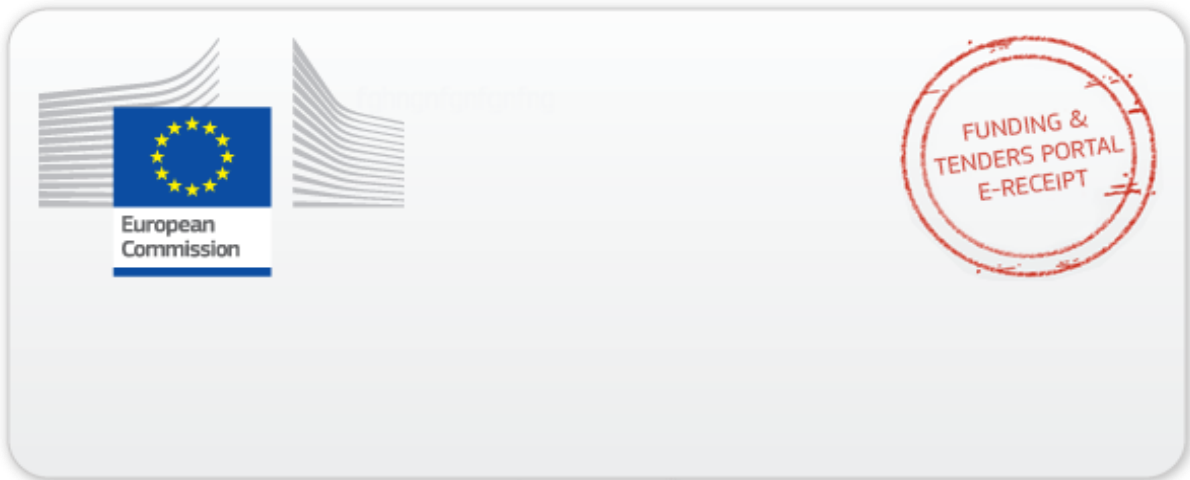
Artificial Intelligence

Status: **Yes**

If YES, the technical robustness of the proposed system must be evaluated under the appropriate criterion.

Overall comments

Not provided



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