

TEMA'S OBJECTIVES

Improve Natural Disaster Management (Natural Disaster Management) using new digital technologies and extreme data analytics.

Improve and accelerate extreme data analytics, by increasing trustworthiness, accuracy and responsiveness of extreme data analysis algorithms;

Improve and accelerate emergency phenomenon modeling, evolution predictions, simulation and interactive visualization.

SCOPE

TEMA will provide heads-up, hands-free, contextualized operational support in a wide range of environments to fasten and ease the realization of complex tasks while making them safer. A highly advanced and versatile Augmented Reality (AR) interface will be developed for integrating and visualizing live all **TEMA** results, as support for human user in an operational “control room”, while also allowing them to interactively assess contingent response alternatives via simulation.

TEMA will deliver a technical solution to make modern AR systems exploitable in disaster response and management, bringing situational data to relevant end-users, thus providing the relevant information that can help make the best possible operative decisions.

THE PROJECT

HORIZON-CL4-2022-DATA-01-01:

Methods for exploiting data and knowledge for extremely precise outcomes (analysis, prediction, decision support), reducing complexity and presenting insights in understandable way (RIA)

VALUE PROPOSITION

TEMA will improve Natural Disaster Management by providing a disaster management support system, dynamically exploiting multiple data sources and AI technologies for providing an accurate assessment of an evolving crisis situation.

SOLUTION

In light of such urgency, and under the advancements in science and technology that have been achieved in recent years, the TEMA research project will develop methods and technologies to facilitate disaster management procedures, focusing 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.

PROBLEM

Natural Disaster Management, in order to support disaster prevention and preparedness, requires adopting technologically advanced tools capable of analysing and processing large volumes of data from different sources to provide predictions on the evolution of phenomena in (near) real time and to be useful to stakeholders for recommendations and guidelines to adopt in dealing with a complex emergency.

CONTEXT

Climate change is leading countries in Europe to experience increasingly frequent and damaging adverse climatic events, such as large fires and flooding. The impact of severe weather events is expected to make Europe increasingly vulnerable due to the magnitude and frequency with which they will occur in the coming years.

IMPACT

- 1 Scaling-up European capacity for extreme data analytics.
- 2 Explainable, robust and humanly verifiable analytics
- 3 Fast and precise phenomenon prediction and response planning
- 4 Reduction of emergency response times during Natural Disaster Management
- 5 Improvement of decision making during Natural Disaster Management
- 6 Boost the EU policy agenda in the Data Spaces domain, as well as in the adoption of Decision Support Systems for emergency management
- 7 Quantification of the effectiveness of the integrated solution in realistic disaster management scenario
- 8 Opening up a new market segment via the envisioned Extreme-Analytics-as-a-Service, which makes select TEMA methods available to external users via the cloud and standardized interfaces.

PILOTS

Germany Central-European Regional Floods

Pilot site: Bavaria

Central Europe, due to presence of big rivers, can experience heavy persistent rains that cause regional floods, as happened during July 2021 in the German region of Ahrtal. In this pilot, a flood model will be set-up for the area and calibrated based on information retrieved from historic flood events, including the Ahrtal flood.

The objective of TEMA is to provide information to be used to warn the responsible authorities, population and public protection, and provide information about the accessibility of the affected region leading to improved Natural Disaster Management.

Greece Mediterranean Flash Floods

Pilot site: Municipality of Mantoudi-Limni-Agia Anna

The geomorphology and hydrological characteristics of Mediterranean catchments render such areas particularly prone to flash floods.

The Greek pilot land area is among these, therefore, considering also the mega-fire occurred in August 2021, a flood model will be set up for the area and calibrated based on information retrieved from historic flood events as well as near-real-time information coming from the observations of streamflow gauges.

The model will support (near-)real-time flood forecasting and flood warnings and can be used to examine and enhance the relevant Natural Disaster Management procedures.

Italy Mediterranean Forest Fires

Pilot site: Montiferru

The Autonomous Region of Sardinia (RAS) faced a severe crisis in July 2021, when a widespread 15.000-hectare forest fire provoked serious damages at Montiferru (central Sardinia).

This scenario will be played out in real time for TEMA validation, with available data about the area vegetation, geomorphological data, damage details and safety procedures that have been adopted, output of meteorological models, forecast fire danger bulletins, satellite images, videos from drones filming the burnt area. The TEMA platform will also be used for examining the conditions of post-event territory, with particular regard to the implications for geomorphological risk.

Finland Finnish Forest Fires

Pilot site: Kainuu area

Forest fires and the general extreme weather conditions in the Nordic countries, cause concern among Finnish emergency professionals. The pilot will be based on the historical scenario of the 2021 Kalajoki forest fire.

This will provide a study case on forest fire management operations through the aggregation of environmental data sources, both existing and collected during the project.

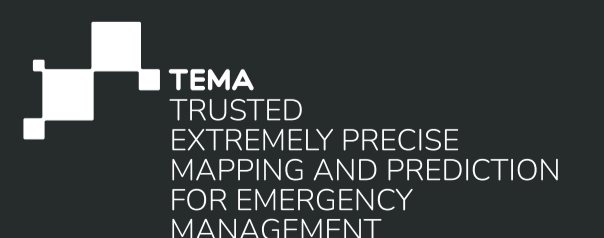
These datasets will be enriched with earlier reports on prevention strategies, as well as guidelines of the Finnish authorities for the boreal vegetation environment. By using TEMA solution, it will be possible to examine and improve procedures for managing disasters and for decision making.

Contact us

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