

Enhancing emergency management with real-time critical action planning over extreme-scale data

EU-funded CREXDATA project develops a prediction-as-a-service platform that will allow for predictive analytics and forecasting under uncertainty for proactive decision making in crises

17 March 2023. CREXDATA (Critical Action Planning over EXtreme-Scale DATA) is a Horizon Europe project that will push the frontiers of analytics, prediction, simulation and visualization to provide extremely precise, timely and useful information that support human and automated decision-making in critical situations. Through the envisioned prediction-as-a-service platform (PaaS), authorities will have access to the tools they need to confidently prepare for critical situations. CREXDATA launched on 1 January 2023. Its fifteen-partner consortium kicked-off the project in Athens, Greece.



Figure 1: CREXDATA partners meet in Athens, Greece to set the foundation for this joint venture

Whether it is health crises, weather-induced emergencies, maritime forecasting, or beyond, real-time extreme-scale data (data of high volume, velocity, variety, veracity) provide the opportunity to inform current critical action planning practices. However, current practices are latent and depend on offline methods that rely on historic good practices rather than quality and up-to-date data. These practices are often reactive and force decision makers to rely on comparatively limited data and do not take advantage of European data sources.

CREXDATA will exploit extreme data to create truthful simulation models and tools to mimic the properties of real-life extreme scale data streams that express normal and critical conditions. These simulations and tools will be streamed into real-time predictive learning models that will be trained as information enters. The resulting PaaS platform will allow action planners to easily register their various data stream sources and receive user friendly predictive analysis workflows, supported by transparent AI techniques and Augmented Reality, that will facilitate decision making. These workflows will provide flexible, trustworthy and fit for purpose solutions that respond to users' needs.

Three use cases will evaluate CREXDATA technology:

- The **weather emergencies use case** will work to improve situation awareness in emergencies related to vegetation fires and floods to inform the decision-making of civil protection authorities.
- The **health crisis use case** will integrate epidemiological and multi-scale simulation models using large-scale machine learning to develop a generalizable and flexible platform that will support authorities' ability to design strategies for health crisis responses.

- The **maritime use case** will develop the first weather and emergency routing and route forecasting solutions that will be performed for all vessels of a fleet simultaneously.

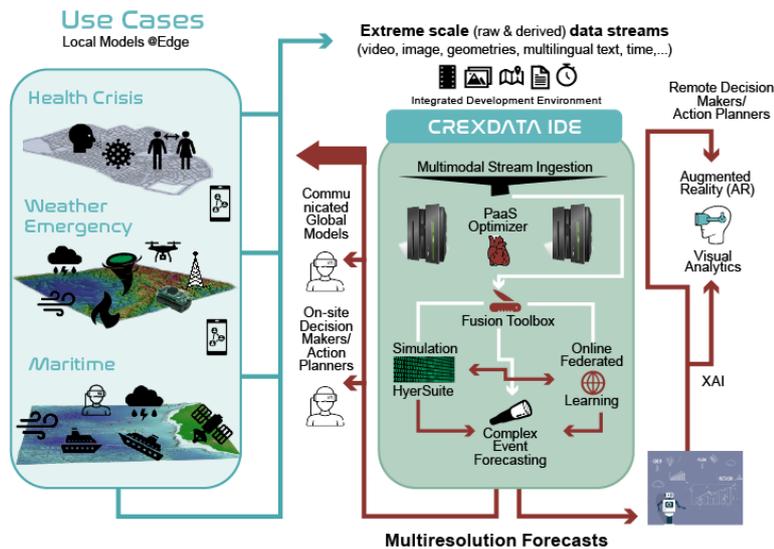


Figure 1: ©CREXDATA Concept Overview

CREXDATA Coordinator, [Antonis Deligiannakis](#) from the Technical University of Crete says,

“CREXDATA's innovative platform is poised to change the way critical situations are managed. The platform is set to boost proactive decision making by providing highly accurate and transparent short- and long-term forecasts to end-users, explainable via advanced visual analytics and accurate, real-time, off and on-site augmented reality facilities.”

About CREXDATA

The CREXDATA (Critical Action Planning over EXTreme-Scale DATA) project is funded under Horizon Europe Research and Innovation Action number 101092749. This three-year project began on 1 January 2023. The [Technical University of Crete](#) leads this 15-partner consortium composed of: [National Center for Scientific Research ‘DEMOKRITOS’](#), [Universitaet Paderborn](#), [RapidMiner GMBH](#), [MarineTraffic](#), [Barcelona Supercomputing Center](#), [Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V.](#), [Consiglio Nazionale delle Ricerche](#), [Hydrometeorological Innovative Solutions](#), [Deutsches Rettungsrobotk-Zentrum e.V.](#), [Fire Department Dortmund/Stadt Dortmund](#), [Universidad Rovira i Virgili](#), [Finnish Meterological Institute](#), [Disaster Competence Network Austria](#), [Finland Ministry of Interior](#).