

## **CREXDATA: Critical Action Planning over Extreme-Scale Data**

### **Description**

The vision of CREXDATA is to develop a generic platform for real-time critical situation management including flexible action planning and agile decision-making on streaming data of extreme scale and complexity. CREXDATA develops the algorithmic apparatus, software architectures and tools for federated predictive analytics and forecasting under uncertainty. The envisioned framework boosts proactive decision making providing highly accurate and transparent short- and long-term forecasts, explainable via advanced visual analytics and accurate, real-time, augmented reality facilities.

To achieve its vision, CREXDATA will develop a next generation Prediction-as-a-Service (PaaS) system where action planners will easily register their multimodal data stream sources and compute resource federations and graphically design predictive analytics workflows including (i) data ingestion, fusion, (ii) simulation, (iii) federated learning for pattern extraction and (iv) multiresolution forecasting operators. Decision-makers will receive extremely precise forecasted representations of future worlds reasoned about using transparent AI facilities and with reduced complexity via visual analytics and intuitive augmented reality provided on-site or remotely.

The CREXDATA architecture incorporates 10 exploitable assets based on cutting edge research, which will significantly outperform the current state of practice in respective fields. CREXDATA will be evaluated in three use cases where real-time critical action planning and timely decision making are of utmost importance: i) maritime domain, for forecasting hazardous situations at sea and impose safer navigational routes, ii) weather emergency management, to allow authorities and first responders proactively act so as to avoid or reduce the impact and speed up recovery from natural disasters, and iii) health crisis management, to limit pandemic outbreaks and come up with non-pharmaceutical means of patient treatment.

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