

<p><b>TYPE</b></p> <p>[SERV] [METH]</p>	<p><b>TECHNICAL READINESS LEVEL</b></p> <p>TRL4</p>	<p><b>INTELLECTUAL PROPERTY RIGHTS</b></p> <p>PROPRIETARY</p>	<p><b>EXPLOITATION ROUTE</b></p> <p>OPEN SOURCE   SOFTWARE REGISTRY</p>
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DataFusion merges data from multiple sources related to the position of the device, in order to produce one cohesive view. It combines, cleans, and integrates datasets, allowing us to make sense of diverse data streams for analysis and decision-making, aiming to have the best possible and precise position.

**KEY BENEFITS FOR COMPUTE CONTINUUM PROJECTS**

The data fusion module plays a crucial role in enhancing the accuracy and reliability of geolocation data, which is essential for ensuring precise decision-making in emergency response scenarios. By integrating multiple geolocation sources—such as GPS signals, Wi-Fi positioning, cellular networks, and inertial sensors—the module mitigates inaccuracies caused by signal interference, hardware limitations, or environmental constraints (e.g., urban canyons, tunnels, or disaster-affected areas). The fusion process leverages both quantitative methods (e.g., Kalman filters, particle filters, or Bayesian inference) and qualitative approaches (e.g., contextual weighting based on environmental conditions) to produce a single, refined position estimate.

This refined geolocation data is critical for the reinforcement learning-based decision-making system, as it ensures that the simulated and real-world agent movements reflect actual physical constraints and spatial dynamics. The increased accuracy directly improves the quality of generated action plans, making emergency instructions more precise and actionable. Additionally, for multi-agent coordination, the fusion module enhances the ability to track and predict the movement of individuals and devices, optimizing resource allocation and response strategies. In industrial and smart city applications, the refined positioning allows for better traffic management, workforce tracking, and overall situational awareness, leading to higher operational efficiency and safety.

**USE AND IMPACT BEYOND EXTRACT**

Beyond its current application in emergency response, the data fusion module is expected to contribute to a broad range of positioning and situational awareness applications, both in research and industrial settings. Thanks to its ability to integrate multiple geolocation sources and its adaptable filtering framework, it can be applied or extended to meet the precise localisation needs of diverse environments, supporting continued innovation in accurate, reliable and context-aware positioning.

**FOR RESEARCHERS AND INDUSTRIAL TEAMS:**

- Reduces geolocation errors by combining multiple positioning sources.
- Can be embedded into existing IoT and AI-driven systems via modular APIs.
- Supports multiple geolocation technologies (Galileo, 5G, cellular networks) for diverse use cases.
- Provides a high-accuracy baseline for testing new positioning algorithms.

**FOR ADMINISTRATORS AND CDOS**

- Enhances real-time geolocation data, ensuring precise tracking of people and assets during crises.
- Minimizes errors in location-based decision-making, reducing the risk of miscoordination.
- Provides a unified, real-time view of geospatial data for improved crisis management.

