Blog Post 1: The Data Lifeline – Fueling Disaster Resilience with Information

In the chaos of a disaster, information is as vital as water or electricity. The PANTHEON project is building a data delivery scheme designed to provide this lifeline to communities and first responders in Athens and Vienna. This post explores the diverse data sources that power our Smart City Digital Twin (SCDT).

The Six Pillars of Data

PANTHEON doesn't rely on a single source of truth. Instead, it fuses data from six distinct streams to create a comprehensive operational picture:

1. **Satellite & Copernicus:** Macro-level data on weather patterns, land cover, and post-disaster damage assessment from European space assets.
2. **In-Situ IoT:** Real-time readings from ground-based sensors measuring temperature, humidity, wind speed, and water levels.
3. **Infrastructure:** Detailed maps of critical networks like power grids, water supply lines, and telecommunications to predict cascading failures.
4. **Traffic:** Real-time flow data from municipal sensors and tollways to model evacuation routes and identify potential bottlenecks.
5. **UAVs:** High-resolution aerial imagery, LiDAR scans, and thermal readings from drone swarms operating directly over disaster zones.
6. **Community:** Crowdsourced data from social media and mobile apps, providing on-the-ground insights directly from citizens.

Types of Data

Our platform handles a vast array of data types, from structured SQL databases and semi-structured CSV files to unstructured video streams and geospatial raster files (GeoTIFFs). A key innovation is the use of **Synthetic Data**—AI-generated data based on real-world patterns—to train our models for rare, catastrophic events without compromising user privacy.