Smart Solutions for pluvial flooding risk alerting

Matteo Colli, CTO

ARTYS

Artys is a branch of darts

ARTYS
ADVANCED ENVIRONMENTAL MONITORING AND ANALYSIS SYSTEMS

THE COMPANY

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ADVANCED ENVIRONMENTAL MONITORING AND ANALYSIS SYSTEMS

Artys is a division of DARTS Engineering specialized in the monitoring and analysis of environmental risks, founded in 2014 as a spin-off of the University of Genoa.

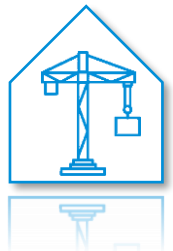
Our services support over 24 organizations by enhancing resilience to natural hazards and providing advanced monitoring solutions.

We help public authorities protect people, assets, and properties from natural risks by offering advanced analysis tools and environmental information based on innovative technologies.


URBAN RESILIENCE


DEFENSE OF THE TERRITORY


SMART MOBILITY


PUBLIC WORK SAFETY


INFRASTRUCTURE SAFETY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Promoted by:

H2020 SME INSRUMENT

SOLAR IMPULSE LABEL EFFICIENT SOLUTION

THE CONTEXT

Weather phenomena:

- Rainfall intensity
- Accumulated rainfall
- Temperature
- Wind gusts

Impact on mobility:

- Reduced driver visibility
- Decreased tire grip on asphalt and hydroplaning
- Local flooding
- Decreased stability of two-wheeled vehicles

SERVICES FOR THE SMART MOBILITY

Real-time information about current weather conditions affecting city streets

Alerting system that aggregates multiple hazard factors

Target users:

- Users of mobility information applications, for better travel planning and real-time decision-making along the route
- Urban transport system operators, with a specific focus on C-ITS (Cooperative Intelligent Transport Systems) managers

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SMART RAINFALL SYSTEM

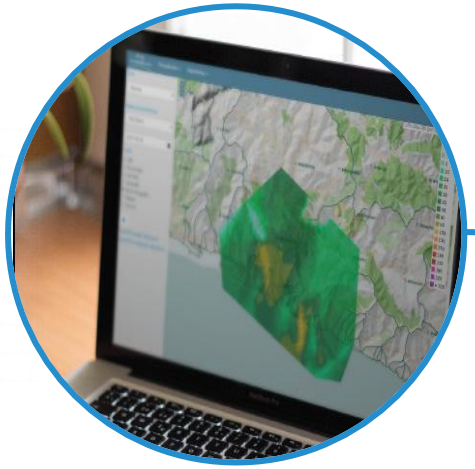
Technology

Smart Rainfall System (or SRS) is the real-time rainfall monitoring technology patented by Artys.

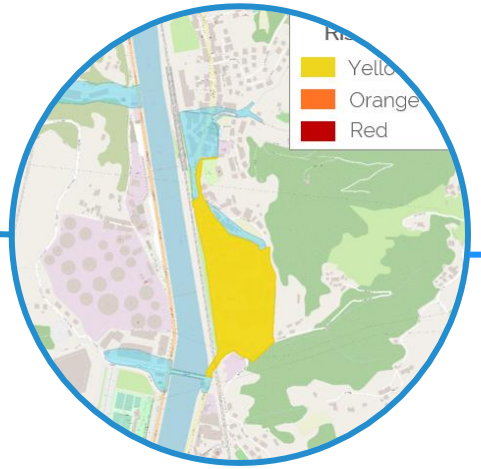
smartrainfallsystem

TV antennas

SRS sensor



Rainfall maps



Flood hazard

Alerting

SRS is integrated in INDRA information DSS to provide the real-time spatial distribution of rainfall and continuatively publish updated and high-definition maps.

Scientific publications on

IEEE
Advancing Technology for Humanity

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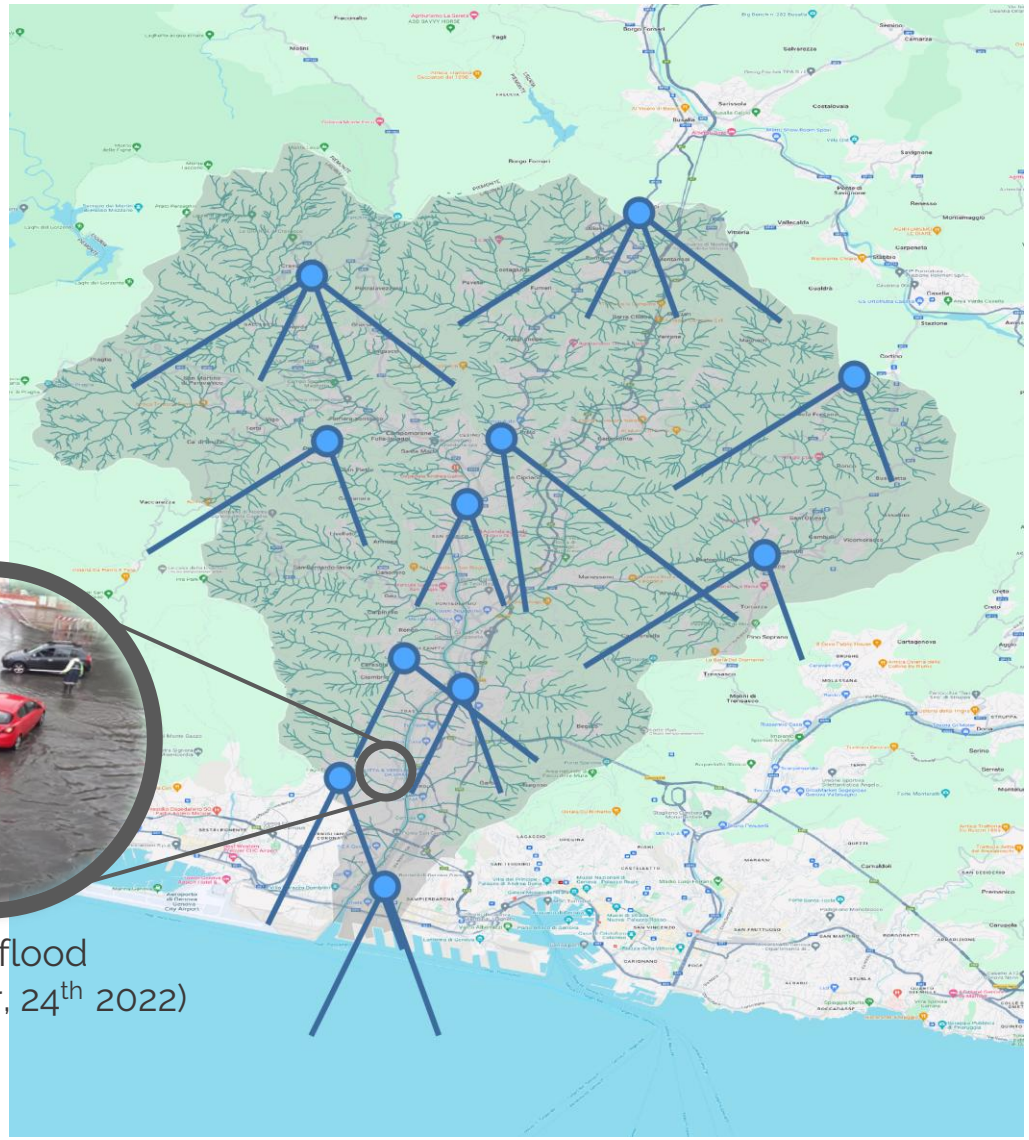
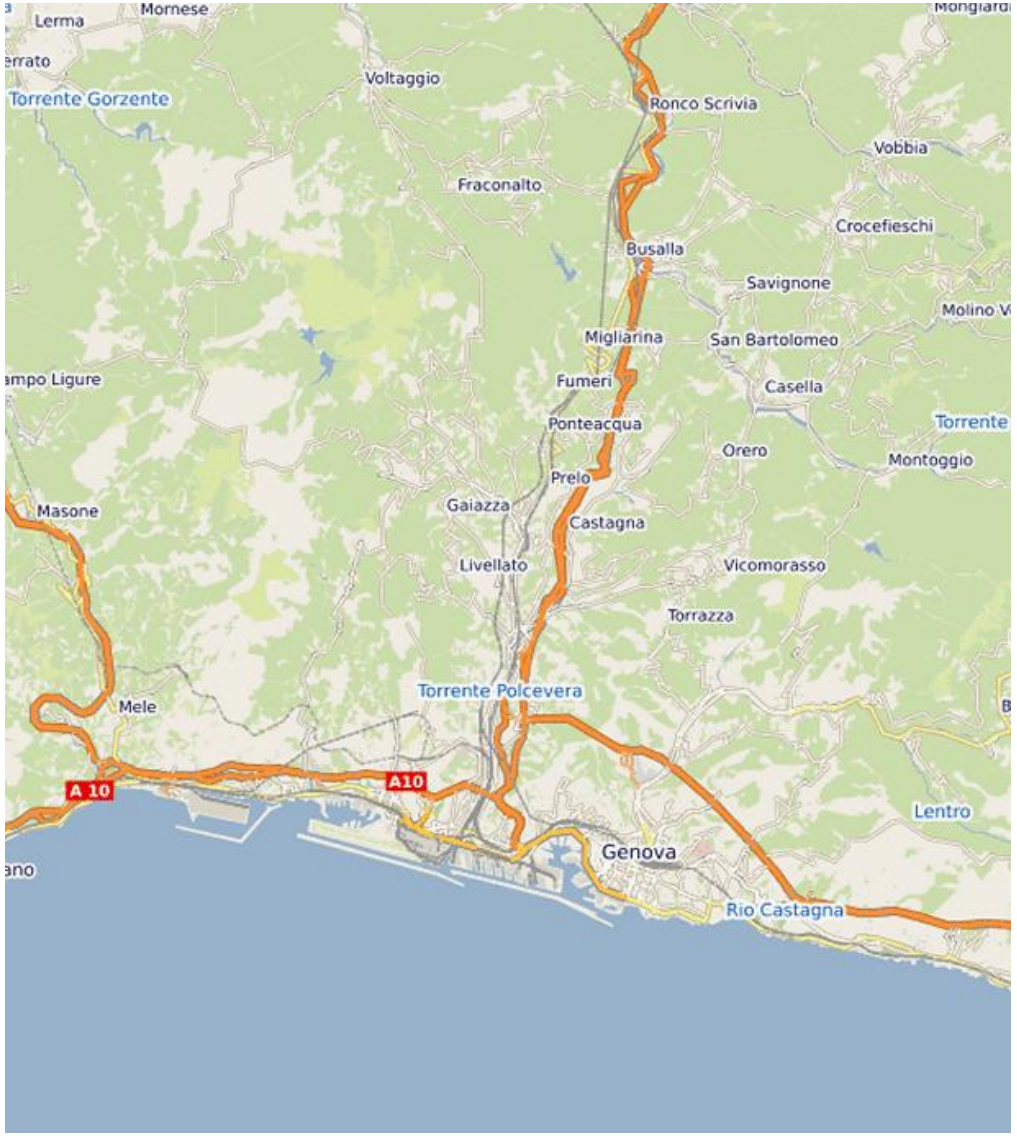
SMART RAINFALL SYSTEM

Use Case



Flash flood
(September, 24th 2022)

SRS sensors locations in Valpolcevera (Genoa, Italy)



Real-time rainfall Intensity maps from SRS

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URBAN FLOOD DETECTOR

Technology

UFD in Sampierdarena district, Genoa (IT) (progetto RUN)

Urban Flood Detector (UFD) is the innovative IoT sensor for detecting floods caused by intense weather events and for real-time measurement of water level.

Thanks to the timely recognition and reporting of potential localized flooding conditions, UFD supports monitoring and emergency response operations in critical areas.

UFD has been tested within the following projects: RUN (FESR Liguria Regional Program), MobilityPLUS (CTE NEXT Torino), and SAFE (Open Italy 2024)

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URBAN FLOOD DETECTOR

Features

- Multi-sensor system with ultra-low power consumption, based on an original design by Artys
- Power system based on low-power electronics and integrated battery, ensuring autonomy of over 10 months
- Multiple Communication Options: GSM/NB-IoT
- Customizable shape and size to minimize visibility (anti-vandalism) and enable installation in critical locations across the territory

UFD in Rossiglione, Genoa (IT) (SAFE project)

UFD in Turin (IT) (MobilityPLUS project)

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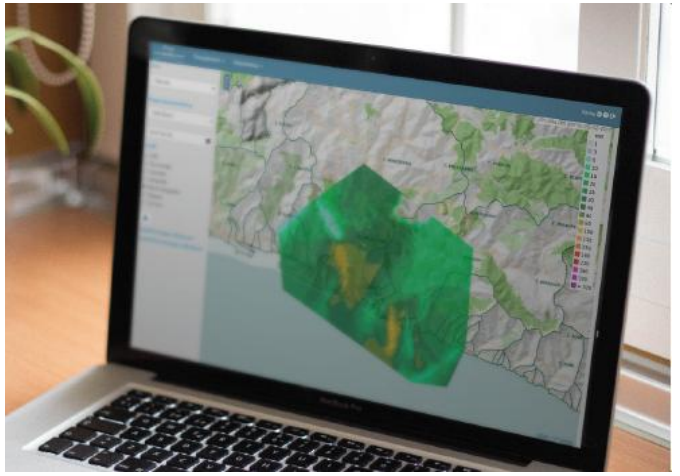
URBAN FLOOD DETECTOR

Features

- Instant and localized detection of surface runoff presence and water level height
- Sharing of information on three flood states (“dry”, “wet”, “flooded”) and measurement of the hydraulic head
- Reporting of the “wet” state only when detected, and frequent/regular updates of water level measurements in case of flooding
- Alerts delivered via instant messaging platforms (e.g., Telegram)
- Integration into the INDRA decision support system, a platform developed by Artys that continuously processes data from both traditional monitoring networks and innovative IoT sensors



ARTYS PROJECTS

MobilityPLUS: a winning project of the 2024 Call4Testing Future City of CTE Next Torino

Decision support system for now-casting and hazard communication related to adverse weather conditions affecting vehicular traffic safety on Smart Roads, through the use of IoT, 5G, and C-ITS technologies.

Objectives:

- To demonstrate a system prototype service in the relevant urban environment of Turin (Italy)

IoT network deployed by Artys:

- 4 Smart Rainfall System sensors
- 3 Urban Flood Detectors

After-project developments

- Integration within the C-ITS platform of the city
- To support travel planning and navigation systems

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