

The RESCUE System

RESCUE is a **light, smoothly wearable** localization and navigation system allowing the remote tracking of pedestrians when the GPS signal is unreliable or absent (building interiors, forests, urban canyons, underground areas). RESCUE is based on the processing of raw inertial data, acceleration and angular velocity, of pedestrians wearing the system.

A RESCUE main capability is to **exploit** and **integrate** a range of information from different sensors (**magnetic sensor, barometer sensor, GPS signal if and when available**) to improve location estimates.

Heterogeneous Data Integration

Tracking and Rescue

The capability of detecting critical operator conditions (**operator laying down/still for an exceeding long time**) and integrating biometric sensor data (**cardiac and pressure meters**) can provide the remote control center with **safety alerts** in order to activate a timely rescue intervention by just following the path walked by the operator both in indoor and outdoor environments.



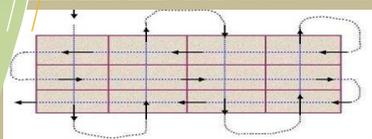
Training for first responders Simulation of intervention strategies

Due to the capability of a remote control center to track, display and record the simultaneous paths walked by several operators each carrying a RESCUE system and their mutual positions at each instant, such multi-operator system can be an **effective aid** in simulation and virtual training activities to:

- verify at each instant the effectiveness of squad placing
- check the correctness of the foreseen displacements
- assess the whole simulated intervention strategy
- validate the success of the training

Active Search Tactics

Grid search



The **knowledge of the path** walked by the operators can be an effective aid in evaluating and optimizing the mission rules such as **Grid search paths** for active search both in indoor and outdoor areas.



APPLICATIONS

Remote tracking of operators and intervention squads

Support for rescue activities

Aid in evaluation of simulated operations

Assessment of the Intervention strategies

Evaluation of virtual training for first responders

Aid in assessment of active search tactics

Aid in grid search

Checking and optimization of the inspection routes

Remote tracking of participants to AirSoft or PaintBall war games

SUITABLE FOR:

Fire and Police Departments

Civil Defense and Volunteer Organisations

AirSoft and PaintBall Clubs

Security Guards

POOR OR
SPORADIC
GPS SIGNAL

Buildings, Plants

Urban canyons

Deep valleys

Forests

TOTALLY ABSENT
GPS SIGNAL

Tunnels

Caves

Underground areas

RESCUE SYSTEM

SENSING UNIT

Location: shoe heel

Weight: 20 g.

Dimensions:

(74 x 27.5 x 13.5) mm

Power Consumption:

60 mA @ 3.7 V (0.22 W)

COMPUTING UNIT

STANDARD RELEASE

SW App running on

Samsung Galaxy S2

COMPUTING UNIT

EMBEDDED RELEASE

Location: pocket/belt

Weight: 70 g.

Dimensions:

(66 x 47 x 28) mm

AirSoft and Paintball Arenas

The **RESCUE system** can be employed in **entertainment activities** such as simulated war games (AirSoft, PaintBall) where the real-time knowledge of the participant positions may:

- improve the game reality
- refine the expected simulation
- ensure greater involvement
- add value to the game proposal



Surveillance and Security Activities

RESCUE can be an effective aid for **surveillance and security activities** performed in large buildings (company headquarters, storage areas, big stores, warehouses).

The capability of **tracking** and **recording** the path walked by the operators wearing the system can provide the real time visualization of the inspected areas.

The **recording** of the walked paths can be used to improve the effectiveness of the inspection routes.

Canine Units

Being the system based on the exploitation of features of inertial data present in the rhythm of the gait, the system could also be worn by searching dogs belonging to Canine Units, to track their position during rescue activities.



RESCUE Components

The RESCUE standard configuration includes:

- The **Sensing Unit**, wearable on a shoe heel, providing raw inertial data to the Computing Unit.
- The **Computing Unit**, a SW application running on a commercial smartphone, processing and integrating the raw data with magnetic information and GPS signal (if and when available) and sending it to the remote station via **Wi-Fi** or **Radio-Modem connection**.
- The **MMI SW**, running on a remote station in any commercial PC or notebook, receiving and displaying real-time processed data.

An embedded solution for the **Computing Unit** has been also developed to smoothly connect commercial Radio-Modems and increase the system robustness avoiding the use of the smartphone.