

Research Equipment for the

# positioning and navigation of travelers



IFSTTAR

## ULISS

### A smart device for research on indoor/outdoor positioning and navigation methods

ULISS (Ubiquitous Localization with Inertial Sensors and Satellites) is a lightweight handheld device dedicated to research on geolocalisation solutions for travelers. It records signals from several sensors, i.e. inertial/magnetic sensors and GNSS receiver, in all environmental and experimental conditions, both indoors and outdoors. ULISS supports the development and improvement of novel ubiquitous geolocalisation algorithms based on the signals commonly recorded by smart connected objects.

#### Components and characteristics

Weight < 200 g

##### VN300 inertial unit (VectorNav)

Sampling Frequency 200 Hz

Triaxial accelerometer

Triaxial gyroscope

Triaxial magnetometer

Pressure

Temperature

Single-frequency GPS receiver 5 Hz

##### SD card

##### Battery

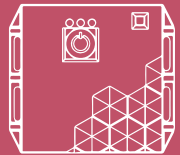
Battery life 4 hours



## PERSY

### Indoor/outdoor pedestrian's reference trajectory

PERSY software suite



PERSY (Pedestrian Reference System) aims at computing reference trajectories of indoor/outdoor pedestrians' footpaths. It is rigidly attached to the foot and hybridizes all signals from the multi-sensors platform with a "strapdown" mechanization. The signals are GNSS raw data, inertial and magnetic measurements. The sensors are of higher grade and the fusion process integrates more accurate state vector estimation assisted by biomechanical gait features.



1 km walk on two floors. Inertial sensor, magnetometer and GNSS Rx. Accuracy: 0.3% of the traveled distance (state of the art: 1-2%)

#### Components and characteristics

Weight < 300 g

Gyroscope drift 0,5 °/h

PAccuracy of the estimated trajectory 0,3 %  
(% of the distance travelled)

##### STIM300 (Sensoror)

Sampling Frequency 160 Hz

Triaxial accelerometer

Triaxial gyroscope

##### HMC5983 (Honeywell)

Sampling Frequency 160 Hz

Triaxial magnetometer

##### NEO-M8T (Ublox)

Single-frequency, dual-constellation GNSS receiver 5 Hz

##### SD card

##### Battery

Battery life 4 hours



## Research equipment for the positioning and navigation of travelers

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