

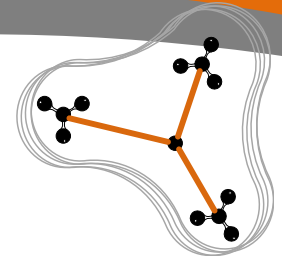
FI-Sonic Project

Smart Audio Analytics for Smart Cities

Continuous Sound Acquisition and
Event Identification


Monitorização de Ruído em Contínuo e Análise de Eventos Sonoros
(in portuguese)

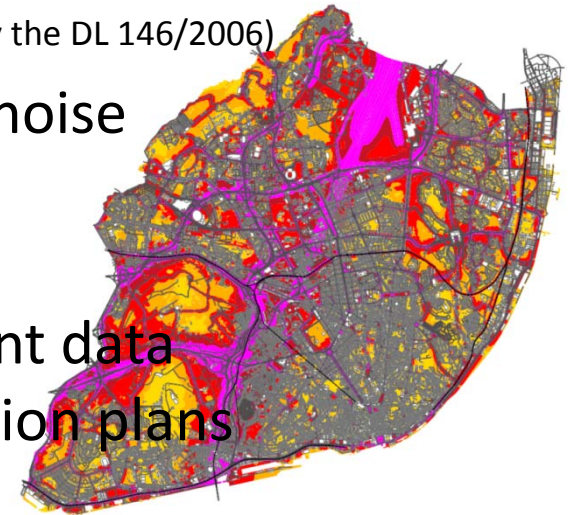
General



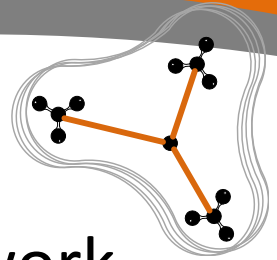
- EU commitment for a healthier sound environment
 - European Union issued a directive (2002/49/EC), Environmental Noise Directive, END.

(transposed to Portugal law by the DL 146/2006)

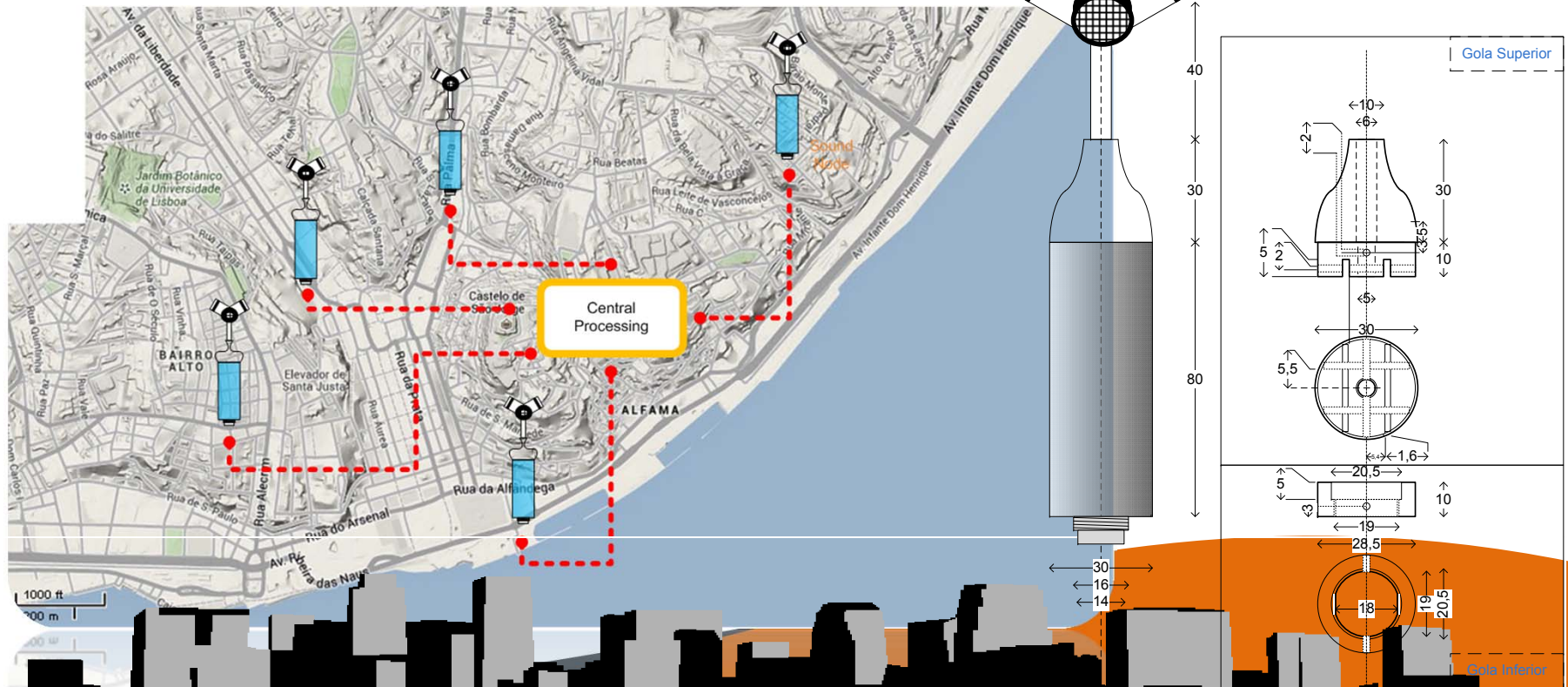
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- Cities must regularly develop and publish noise maps
 - The directive says that public should:
 - be made aware of any noise assessment data
 - be consulted during the drafting of action plans
 - informed of any decisions taken



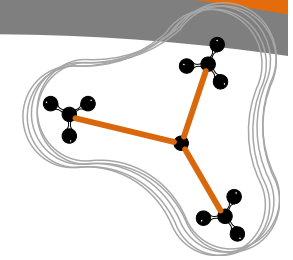
FI-Sonic Concept



- processing and analyzing audio signals using a network of multichannel microphones and accelerometers using the FIWARE platform



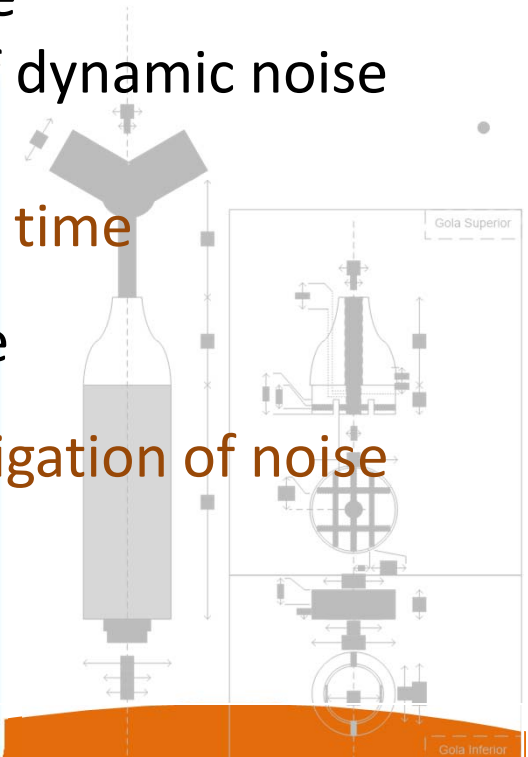
FI-Sonic Concept



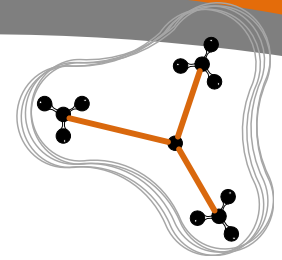
- Characteristics and benefits

1. Sound monitoring in continuous and in real-time

- Updating noise maps to create the concept of dynamic noise maps
- Viewing the evolution of the noise levels over time
- Make available to the public, FI-Lab data store
- To identify and prioritize action plans and mitigation of noise (improvement investment / impact)



FI-Sonic Concept

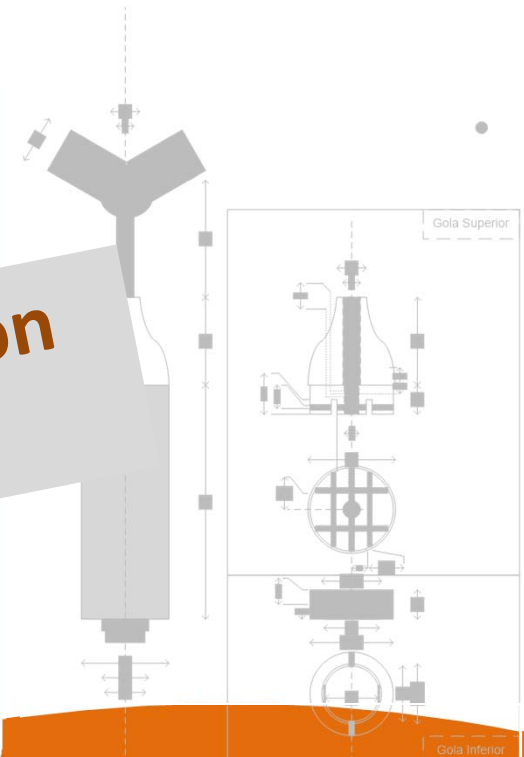


- Characteristics and benefits

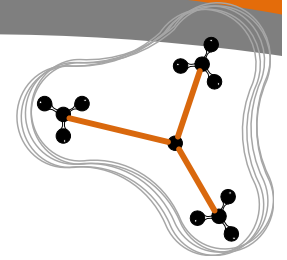
2. detection and localization of sound events.

- light or heavy cars, horns, people in danger
- violence scenes using firearms
- transposition of restricted areas

**Based on sound pattern recognition
using artificial intelligence**

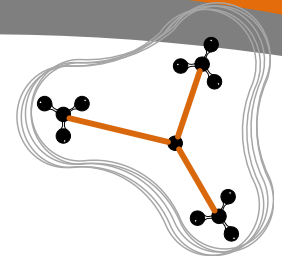


FI-Sonic Concept



- Acquisition module implementation
capable of performing the necessary digital signal processing locally and transmitting summarized results to the network
- FIWARE utilization
- Kurento WebRTC media server
 - to group and process the audio content delivered by the different distributed FI-Sonic audio acquisition modules.
- Orion Context Broker
 - continuous context updates with relevant audio information.

FIWARE relevance



Audio analytics can be used by many other applications

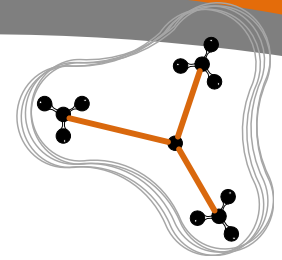
A open source IT Framework is exactly what we are looking for

Real-time audio information can be useful for:

- Smart Video Analytics
- People who Create Software to Display and Monitor Different Events Throughout the City
- Information on Noise Distribution
- Statistics services
- Traffic Control, etc.



FI-Sonic Concept



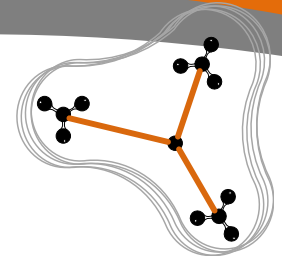
- Deployment example
- Scenario – Lisbon
 - Area = 100km² (urban area, essentially)
- First approach (estimated values)
 - 500 acquisition stations
 - 1k € per station
 - 200k € for installation and software



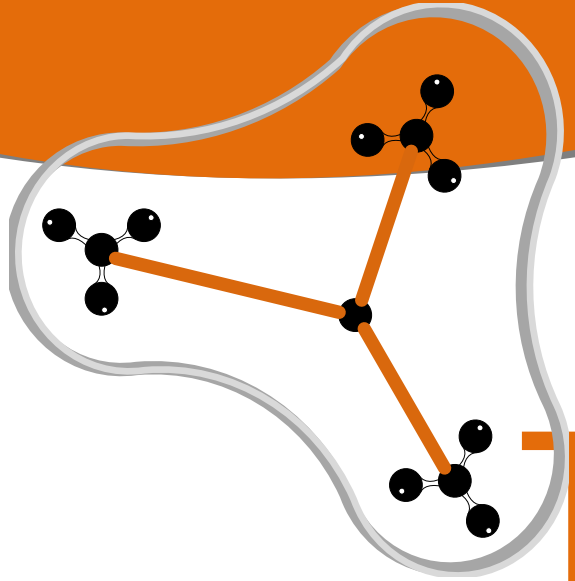
Total investment = 700k €

One tenth of competitor's solutions!

FIWARE relevance



- **t**ARGET MARKET – municipalities and security companies
- **b**USINESS MODEL – sell hardware and services and possibility of make available metadata to other users
- **b**ENEFITS – cheapest system on the market for noise monitoring and event detection
- **c**HAPTER MORE RELEVANT – Internet of Things (IoT) Services Enablement
- **f**UNCTIONALITIES - use of General Enablers reduce programming time (time to market). Reduction of development cost



THANK

YOU



FI-WARE
Open APIs for Open Minds

SOUL-FI
Financial Sustainability of Urban Life and Mobility

ET Concept

