ECHORD++

The European Coordination Hub for Open Robotics Development

Final Review Meeting – WP 5

Daniel Serrano, Eurecat Tech Center, ARSI Consortium

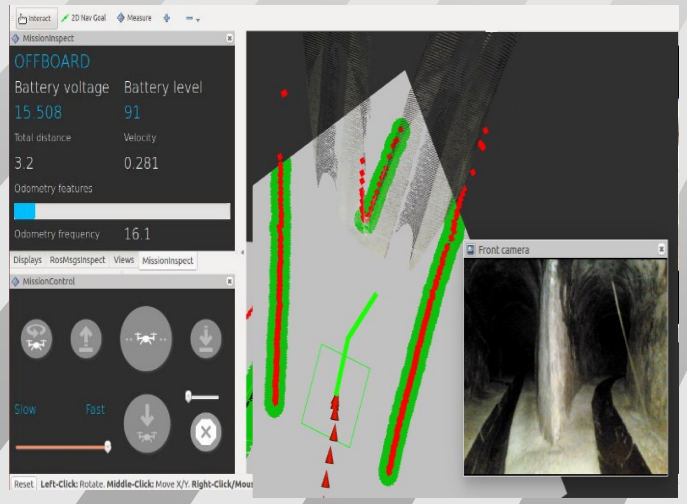
Barcelona – 28th March 2019

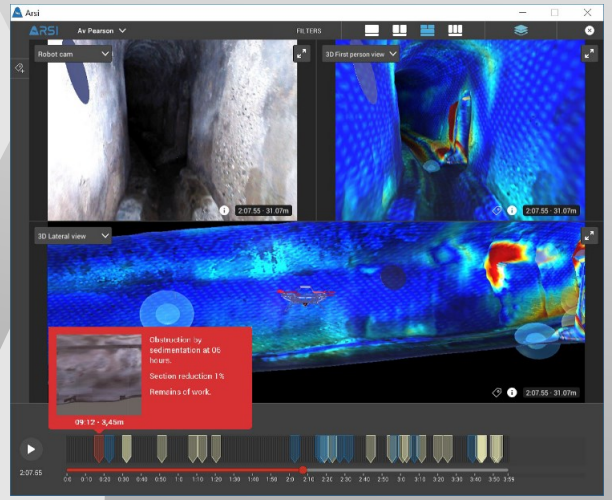
Bristol Robotics Laboratory
BLUE OCEAN ROBOTICS - for humans
RUROBOTS Cognitive Science at Work
SEVENTH FRAMEWORK PROGRAMME

What makes ARSI unique?

First integrated aerial system for sewer inspection with:

- Planning system fully integrated with GIS
- Autonomous flight in sewers
- Realistic Dense 3D mapping
- Defect detection
- Interactive Data Analysis Interface + Virtual Reality





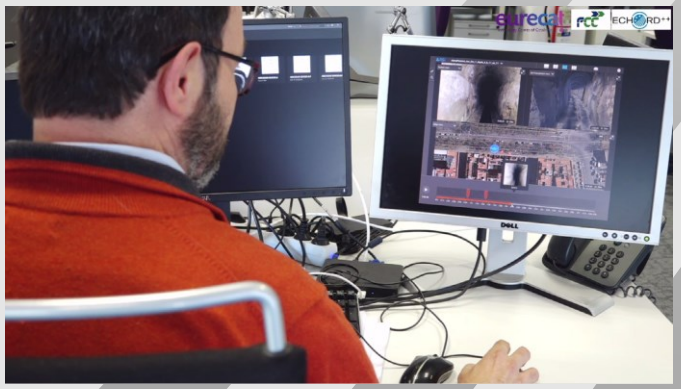
Video

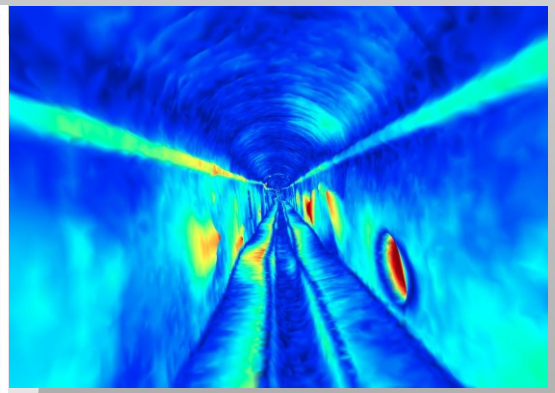
ARSI Final Video

Gain for the public entity

Remove workers from Dirty and Dangerous tasks

Software pipeline for user friendly complete workflow from inspection planning, executio to data analysis





Impact of Work Conducted

What we achieved thanks to ECHORD/EU support

- It helped us to **advance on our R&D** with a clear focus on a specific market niche.
- We have **specialized on robots for inspection and 3D vision**
- We also got **credibility and a strategic positioning** for new projects, commercial opportunities, etc

How does the outcome fit with our development strategy

- **Robotics for inspection** is now a strategic line with several European and national projects (Built2Spec, Nature4Cities, Assets4Rail, Vizta, Active4.0, etc)
- **ARSI in particular**, we will be using it for:
  - Showcased and presented in conferences
  - As background in 2 new European projects and one national tender from a public entity
  - Demonstration to potential customers

Competitive analysis

Drone-based approaches offers several advantages in terms of speed and manoeuvrability

Market analysis[1] of similar initiatives using drones:

- Spain: Triedro, Avansig, Suez Water, Emasesa, etc
- Abroad: Exyn Technologies (USA) Ronik Inspectioneering (HOL), Flyability (SWI), Clickmox (CAN), etc

Conclusions:

- **All them are tackling much wider sections**
- **Most of them are teleoperated**
- **Only few provides 3D mapping and defect detection (others provide thermal)**
- **Those tackling sewer are just starting to research**
- **No fully automated pipeline from planning to visualing reports**

[1] - Informe de necesidad e idoneidad – Canal Isabel II – **Link**

Future use of expertise

Direct exploitation in sewer sector

- Discussions for commercialization through FCC
- Competing to public tender in Madrid
- Interest from other entities and cities (Spain, UK, USA, Canada, Germany, Chile)

Transfer to another sectors.

- We are coordinators of http://www.assets4rail.eu/ to inspect tunnels and bridges for the railway sector
- Infrastructure management, construction, transport and others

Continuation of R&D

- Partners of Vizta ECSEL project starting in April 2019 to advance on 3D sensing and demonstrate it in sewer inspection
- Some other initiatives related to new ICT calls, DIH, etc.

Being an Experiment in ECHORD++

Benefits from participation in ECHORD++

- Detailed description of public entity needs (Challenge brief and interviews)
- Access to real scenario for evaluation and testing
- Joint effort for continuous improvement
- Impact and support for Dissemination and Exploitation
- Community and networking
- Access to potential customers and commercial events
- Cascade funding gives access to smaller players

Impact on Development Process

- Very explicit requirements definition, calendar and evaluation criteria influenced our development plans and priorities.

Actionable Insights

- From a technical perspective, after an initial phase with clear guidance, requirements and evaluation criteria, it would have been ideal to have a final phase with more freedom to explore our own approach, timing and priorities (free-style phase as in other projects).

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Great thanks to Echord++ and EU

Questions?

Commercialization of ARSI

Daniel Serrano, Eurecat Tech Center