

# Reinforcing consortium in EU projects on 3D visualization and risks assessment of aging infrastructures using digital twin technologies (Horizon-CL4, CL3 & CL5)

## Summary

Profile type

**Technology offer**

Company's country

**Switzerland**

POD reference

**TOCH20240212010**

Profile status

**PUBLISHED**

Type of partnership

**Commercial agreement with  
technical assistance****Research and development  
cooperation agreement**

Targeted countries

**• World**

Contact Person

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Term of validity

**12 Feb 2024****11 Feb 2025**

Last update

**12 Feb 2024**

## General Information

### Short summary

A Swiss SME offers pilot-assist technologies & automate data analysis enabling visual inspections of confined spaces & removing risks to health and safety of workers.

Geo-referenced infrastructures can be visualized in 3D using digital twin technologies over secured cloud application. Artificial Intelligence is integrated to detect and rate defects, easily extendable. Augmented data are kept over time to assess infrastructure evolution & manage risks, shared by all involved parties.

### Full description

Visual inspection is the first quick step of assessing the risks of aging infrastructures. Using UAV allows humans to stay safe, removes the needs of scaffolding, ropes or other dangerous accesses, faster data collection and increase productivity of strategic assets.

Centralizing data on secured cloud technologies allows various partners and actors to share the same level of information, augment data with AI or human analysis, see visually defects and locate those on a map and precisely on the asset, see and monitor the evolution over time and start to feed risk management, maintenance and repair planning.

The Swiss company seeks consortium for EU projects where it can help partners:

- reduce the risks involved in inspecting and collecting data in civil engineering infrastructure, especially in including the health and safety of workers
- centralize digital data using modern 3D digital twins georeferenced in a cloud application to share information amongst all actors
- develop new technologies and solutions that facilitate timely identification of maintenance and repair issues in existing civil engineering infrastructure

#### Targeted Calls

HORIZON-CL4-2024-TWIN-TRANSITION-01-12  
HORIZON-CL4-2024-DIGITAL-EMERGING-01-03  
HORIZON-CL4-2024-DIGITAL-EMERGING-01-04  
HORIZON-CL5-2024-D4-02-03  
HORIZON-CL3-2024-INFRA-01-02  
HORIZON-CL4-2024-DATA-01-03

#### Some partnerships:

Local governments (cities) / Asset owners:

A partnership will allow them to feed us with specific requirements about integration in their existing IT ecosystem, suggesting missing features or specific needs not addressed today. We can help digitize infrastructures from inside, including water systems, tunnels, metros, bridges and strategic infrastructures. Data can be shared by other actors, accessed on mobile computers and tablets, secured by cloud technologies.

As good example, an Italian city closed a few roads the day after a routine inspection in an underground stormwater evacuation system. The roof in concrete was at high risk of collapsing, metallic structure was visible and falling down.

#### Civil Engineering / Geometers / Risk Management

A partnership will provide them tools to faster inspection of existing infrastructure, reduce the risks for workers, centralize and share data for better risks management.

#### Energy / transformation

The Swiss company provides tools and services in various energy sectors, from wind-turbine plants (mast inspection from inside), hydropower (penstock, dam), heat production systems (furnace, chimney), recycling centers, tank storage, etc.

#### Maritime / Industrial assets

Holds, ballasts, boilers, silos, tanks and reactors can be inspected in no time without endangering your personnel. Ensure your asset integrity, keep track of corrosion spots and their repairs.

#### Sustainable Goals

Clean Water and Sanitation:

Inspection of sewer systems, reducing the risk of a sanitation issue by improving sanitation services and allowing inspections in risky confined places. Water collectors, penstocks and large pipelines can be verified from the inside.

#### Affordable and Clean Energy:

The company is active in the hydraulic sector for the inspection of dams, penstock, water intake, etc. It has the current European record of the longest inspection for penstock inspection with a 1.2km flight. Inspection of Oil&Gaz infrastructures can improve their reliability, avoid accidents, and reduce environmental unfriendly leakage. The company inspects wind turbine propellers and infrastructure from the inside, reducing downtime.

#### Sustainable Cities and Communities

Following an inspection of the underground water evacuation network (under stress during storms period), an Italian city immediately closed the roads above as too risky in case of seismic or big thunderstorms (European cities are quite old, and their underground infrastructure is as well.)

Part of the public infrastructure within and outside cities is made of tunnels. The usual quick visual inspection

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## mechanisms all

### Advantages and innovations

#### Robotics aspects:

The drones developed by the Swiss company are sold on the market and include confined space capabilities and pilot-assist features that do not exist for outdoor drones. To name a few, drones onboard more than 10k lumens dust-proof lighting so that 4k camera can record useful data in difficult conditions. Despite collision avoidance and roof-lock/wall-lock/tube-lock assistance, a cage protects the propellers. Compared to high-end indoor drones, this drone is not tethered and double flight time, giving comfort and removing stress to the pilot.

#### Software, data storage and analytics on the cloud:

One of the first systems (available for demo) able to regroup indoor and outdoor inspection data for drones. The open vision allows the system to integrate smoothly with others using APIs, include external 3rd parties or custom AI/ML algorithms to detect and classify defects.

A few existing analyzers will streamline the inspection and analysis process to augment the 3D digital twin with precious inspection data coming from multiple sensors.

Geo-referenced infrastructure data can be visualized on a map and data can be shared and accessed by all actors. Compared to existing system, the Swiss company can regroup and centralize in a single-system outdoor and indoor data, store, process, analyze, share and see infrastructure evolution over time.

#### Evolution and innovation:

The existing team can easily and rapidly extend to integrate and develop new concepts.

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### Technical specification or expertise sought

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### Stage of development

**Already on the market**

### IPR Status

**IPR granted**

### Sustainable Development goals

- **Goal 11: Sustainable Cities and Communities**
- **Goal 7: Affordable and Clean Energy**
- **Goal 6: Clean Water and Sanitation**

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## Partner Sought

### Expected role of the partner

The Swiss company can help/support :

- Civil Engineering
  - Task: Analyse infrastructure state, prioritize work and plan maintenance.
- Maintenance and Repair services

- Task: Collaborate on Digital Twin and data sharing aspects.
- Risk Assessment Management
  - Task: Inspection of assets. Data analysis and process automation using cloud technologies.
- Assets Management
  - Task: Integrate with Asset Management Software.
- Robotics for outdoor or indoor Inspections or maintenance
  - Task: Combine forces of walking, crawling and flying robots. Regroup data in common repository.
- AI Experts in defects detection and rating willing to innovate and provide defect detection and analysis.
- Geometer interested in combining georeferenced data with visual inspection of 3D models.
- Water Network Companies
  - Task: Inspect and Analyse network, provide access, prioritize infrastructures.

Type of partnership

- **Commercial agreement with technical assistance**
- **Research and development cooperation agreement**

Type and size of the partner

- **R&D Institution**
- **Big company**
- **SME 50 - 249**
- **Other**
- **SME 11-49**
- **SME <=10**
- **University**

## Dissemination

Technology keywords

- **01004011 - Maintenance Management System**
- **01003008 - Data Processing / Data Interchange, Middleware**
- **01001002 - Digital Systems, Digital Representation**
- **01004007 - GIS Geographical Information Systems**
- **02003005 - Information processing & Systems, Workflow**

Targeted countries

- **World**

Market keywords

- **02004004 - Other scanning related (incl. image processing, ...)**
- **09008002 - Water, sewerage, chemical and solid waste treatment plants**
- **08003005 - Other industrial machinery for textile, paper & other industries**
- **06003003 - Wind energy**
- **06002004 - Hydro-electric**

Sector groups involved