Title: **Situational Awareness: Inside Out with CGI Indoor Explorer**
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Company name / Institute: CGI Nederland B.V.
Project name: CGI Indoor Explorer
Abstract can be published on the website (select): ☒ **YES** ☐ **NO**

Bios

Bart-Peter is a situational awareness specialist at CGI, where he guides development teams from a functional perspective in building innovative systems for the safety sector (Defense, Police, and Space). One of those teams is the CGI Indoor Explorer team, which builds a solution that enables first responders to build shared situational awareness in real-time within indoor environments, by real-time mapping and real-time tracking.



Max van Schendel is a software architect in the Defense unit of CGI. Max specialises in Geo-ICT, which he combines with AI and data engineering. As the architect of CGI Indoor Explorer he designed the system and now guides the team on the technical parts.



Abstract

Imagine entering a building you do not know. No reliable floor plan. No GPS. Limited visibility. Multiple teams moving at once. Every corridor, stairwell and room matters, but the picture is incomplete and the building is on fire.

That is the challenge CGI Indoor Explorer is built for.

Indoor Explorer turns movement through an unknown indoor environment into a live, shared common operational picture. Using visual-SLAM, the system can position first responders within incident buildings and map the environment at the same time. It does not need a perfect map in advance, but it builds a picture as the operation evolves.

But this is not just about mapping.

The real value is collaboration. Multiple users, platforms and sensors can contribute to the same indoor picture in real time. What one operator sees, others can use. What one sensor detects, the platform can fuse with other data. Step by step, fragmented observations become a shared view of the environment. Sensor fusion and computer vision builds towards that shared view, by detecting objects that are relevant to the mission objectives. That shared view is enriched through sensor fusion. Visual data, motion data, positioning information and additional sensor inputs are combined inside the platform to create a more robust and meaningful picture. Especially indoors, where GPS is unreliable or unavailable, this is essential.

Indoor Explorer helps answer the questions that matter: Where are we? What have we already seen? What is changing? Where are the risks? What options do we have? We are actively working on sensor development to improve how indoor environments are perceived, even under difficult conditions. At the same time, we are exploring new HMI concepts — because the interface is just as important as the technology behind it, especially for people who operate in stressful situations. Data only has value when people can understand it, trust it and act on it under pressure.

CGI Indoor Explorer brings together for them who need situational awareness most: visual-SLAM, real-time collaboration, sensor fusion and intuitive human-machine interaction to support better decisions in complex indoor environments. CGI Indoor Explorer is about making the unknown visible.

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