TU Delft
Delft University of Technology

CGI
Experience the commitment®

One world to live in….

Research and results

Robert Voûte
Vice President Consulting - expert

1 October 2018

© 2018 CGI Group Inc.

Robert Voûte, MSc

Vice President Consulting - Expert

- CGI Netherlands (TPL market, specifically Rail)
- Practice Leader Geo-ICT

Teacher and researcher

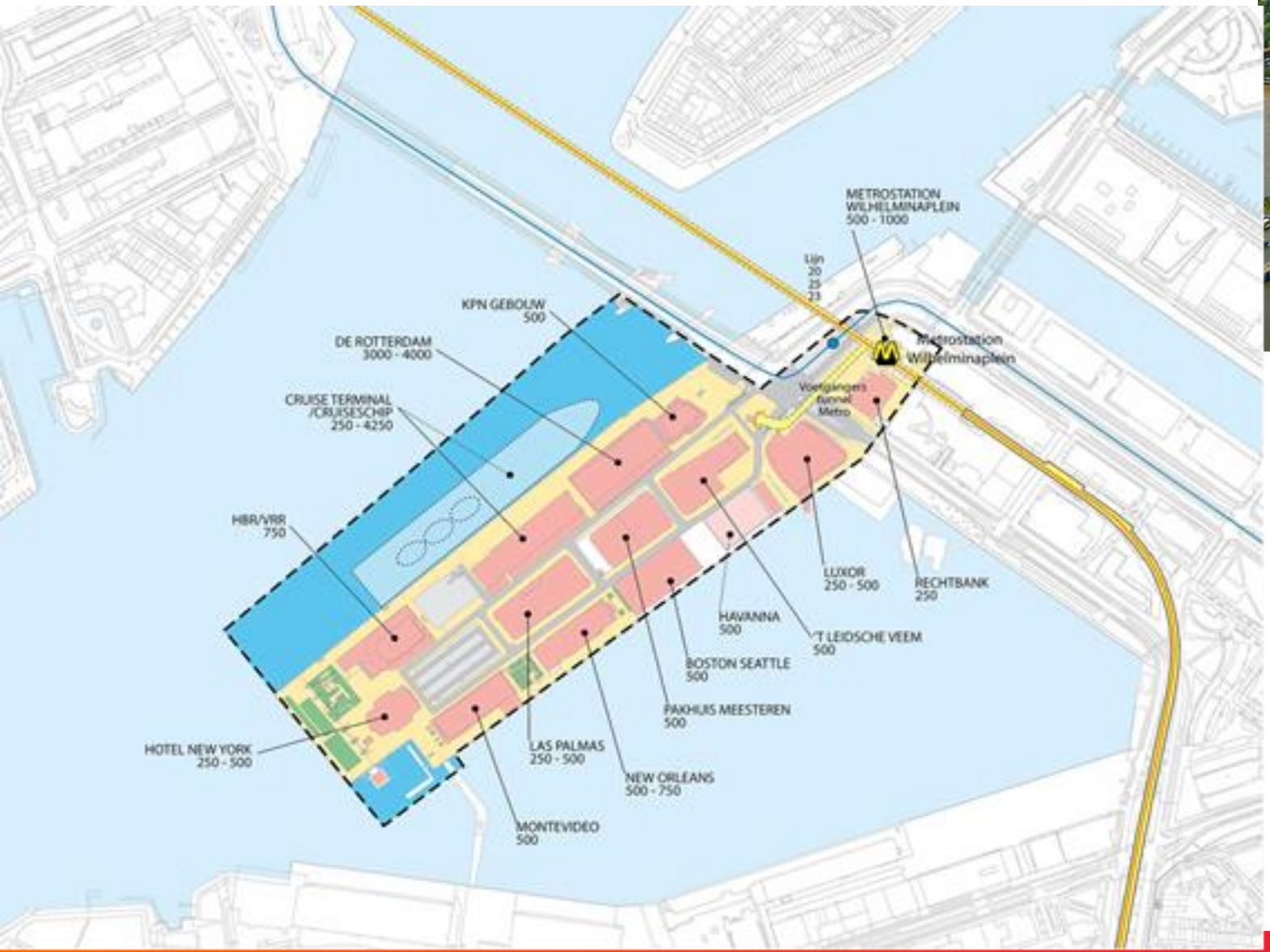
- Delft University of Technology, Geomatics
- Delft University of Technology, Geoscience and Remote Sensing

LinkedIn:

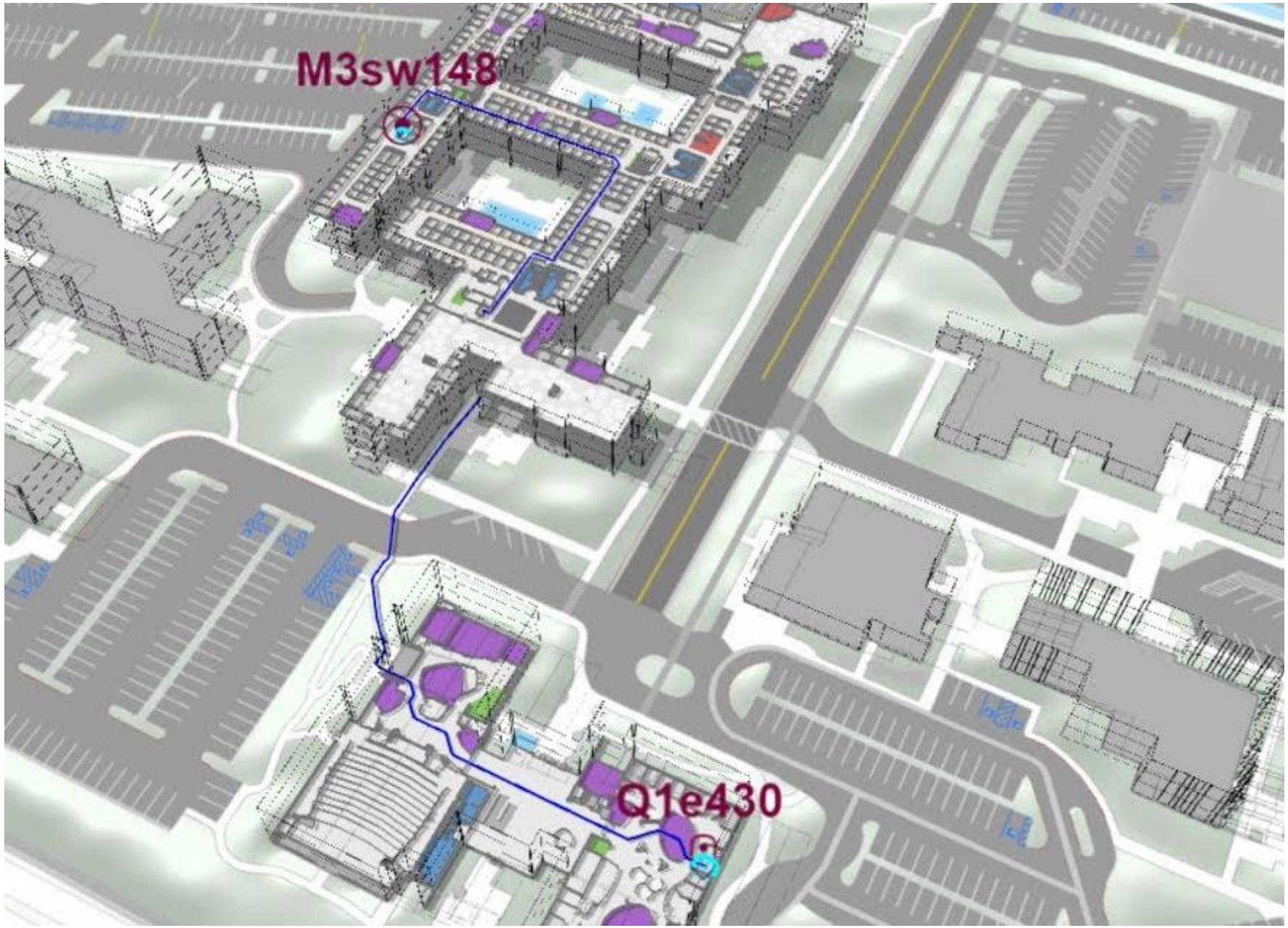
https://nl.linkedin.com/in/robert-voûte-5508b08

9:10
78%
10%
22MIN
10:10
78%
14%
Occupancy
52%
26MIN
Occupancy
23%

Wilhelminapier



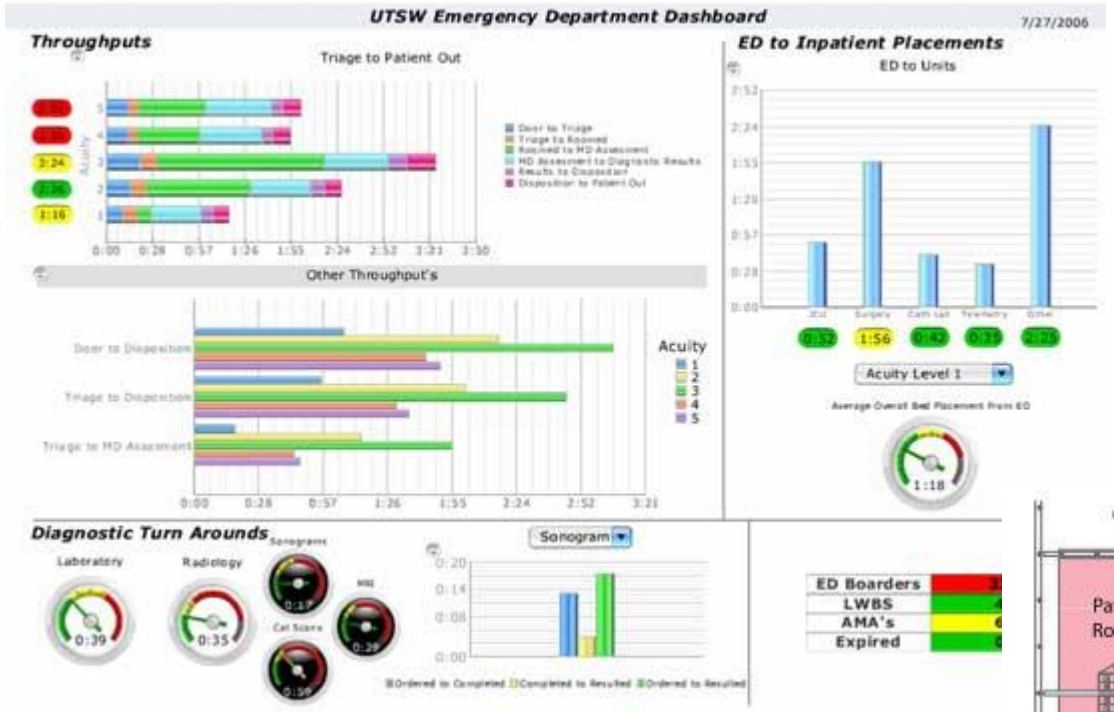
Outdoor and indoor, one world to live in


M3sw148
Q1e430

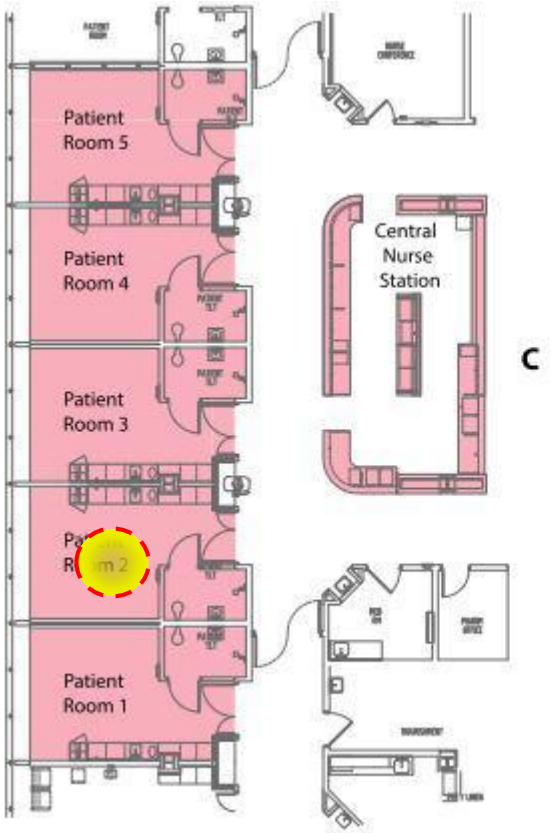
Indoor examples

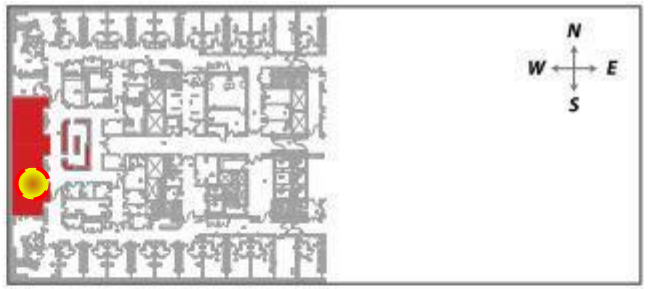
- Hospitals & care centres
- Warehouses & retail centres
- Airports, train/subway stations
- Smart grocery shopping
- Factories
- Musea, public areas etc.

Confidential

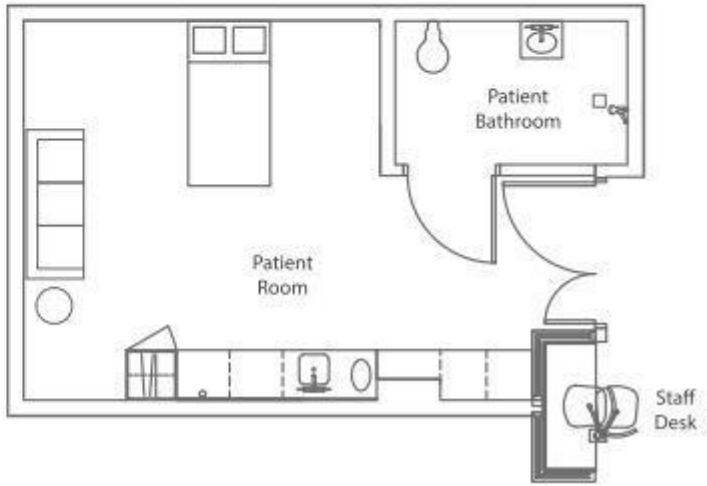

UTSW Emergency Department Dashboard
7/27/2006
Throughputs
Triage to Patient Out
ED to Inpatient Placements
ED to Units
Other Throughput's
Door to Disposition
Triage to Disposition
Triage to MD Assessment
Acuity
Acuity Level 1
Diagnostic Turn Arounds
Laboratory
Radiology
Sonogram
ED Boarders
LWBS
AMA's
Expired

10:15
Dermatologie
Toon route
Tips
Navigeer

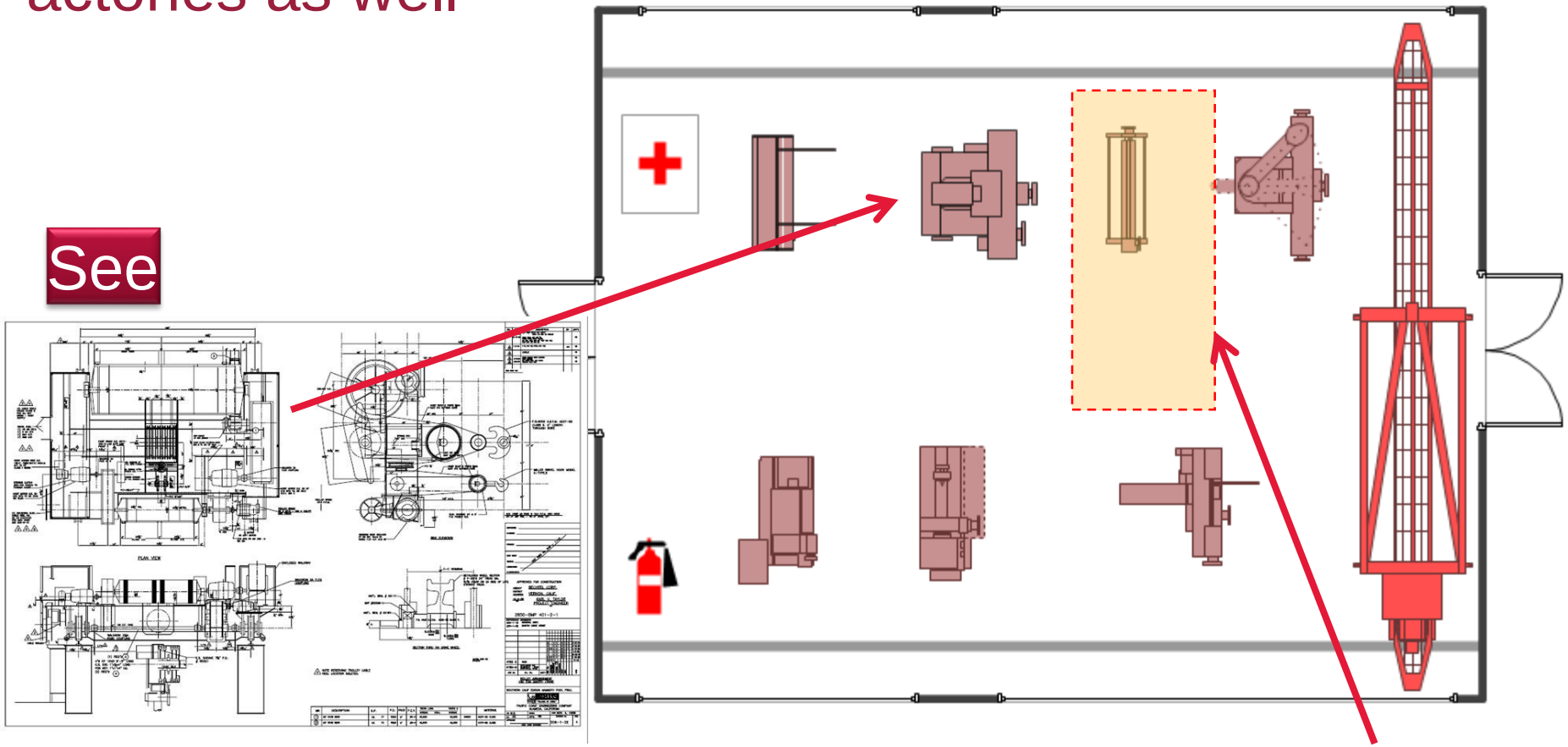

Patient Room 5
Patient Room 4
Patient Room 3
Patient Room 2
Patient Room 1
Central Nurse Station


N
W
E
S

C


Patient Bathroom
Patient Room
Staff Desk

Factories as well



See

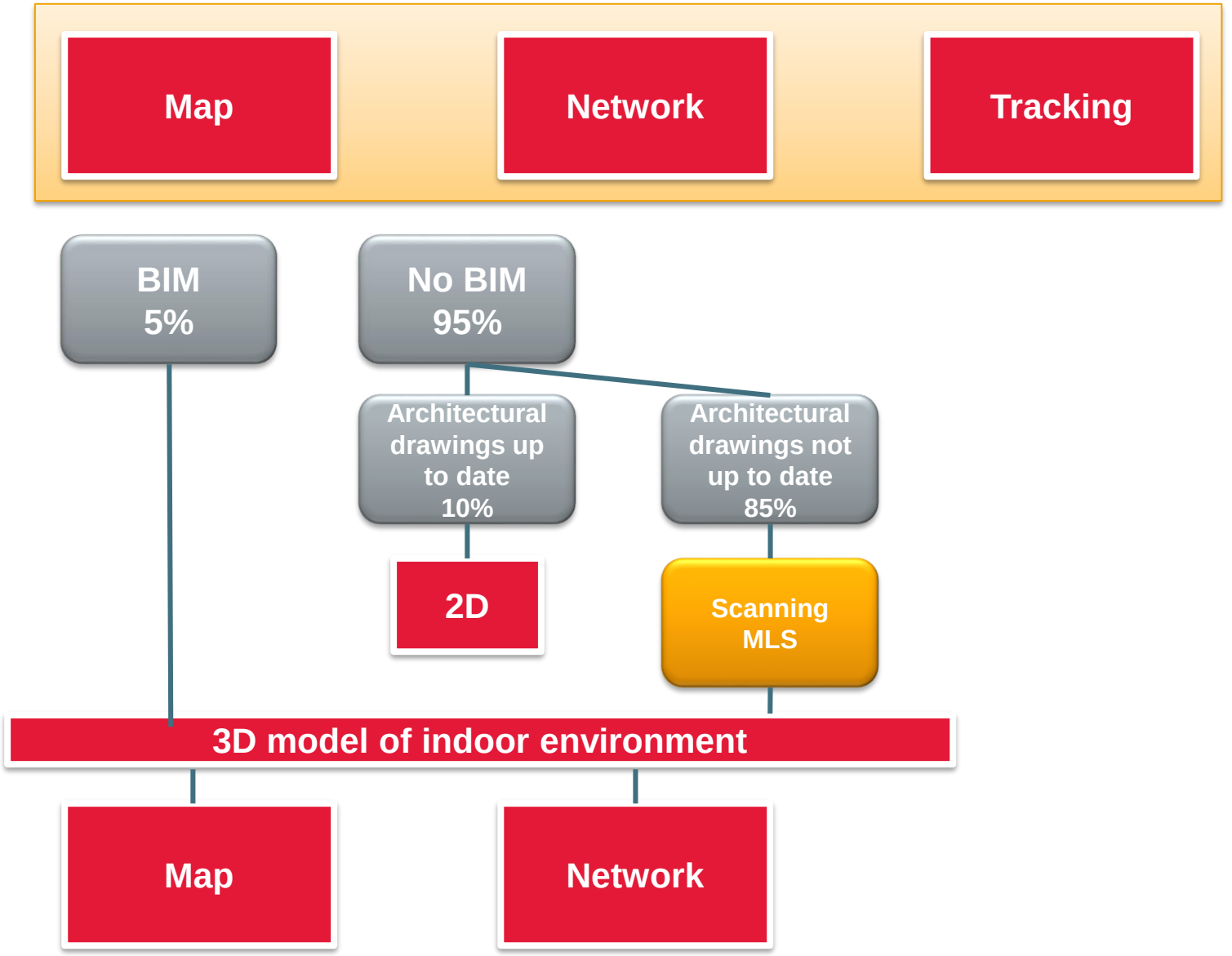
Analysis

Warn

Track (navigation)

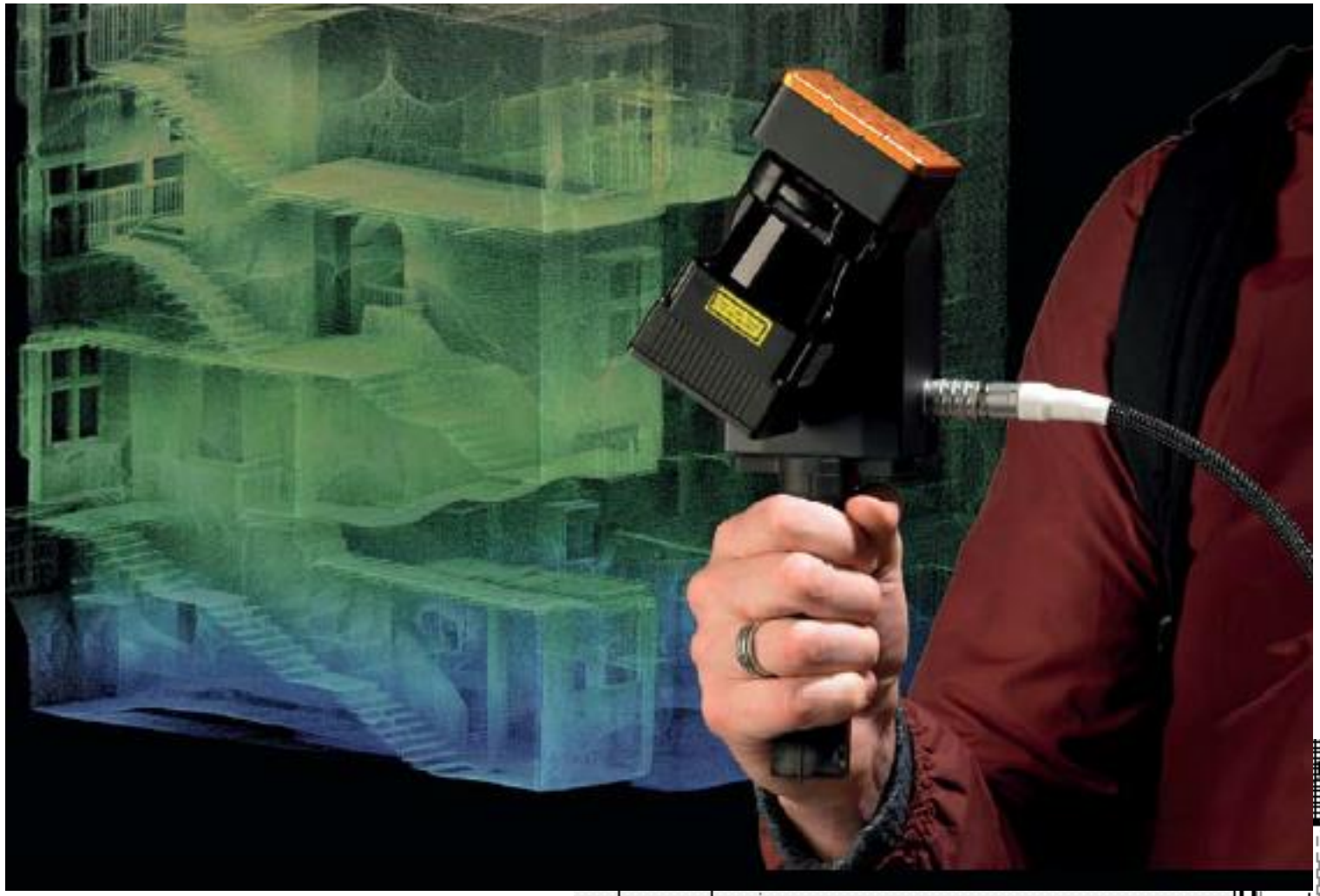
Confidential

Indoor navigation, what do we need?



- Wifi
- BLE
- UWB
- LORA
- 5G
- ~~GPS~~

Scanning with a MLS

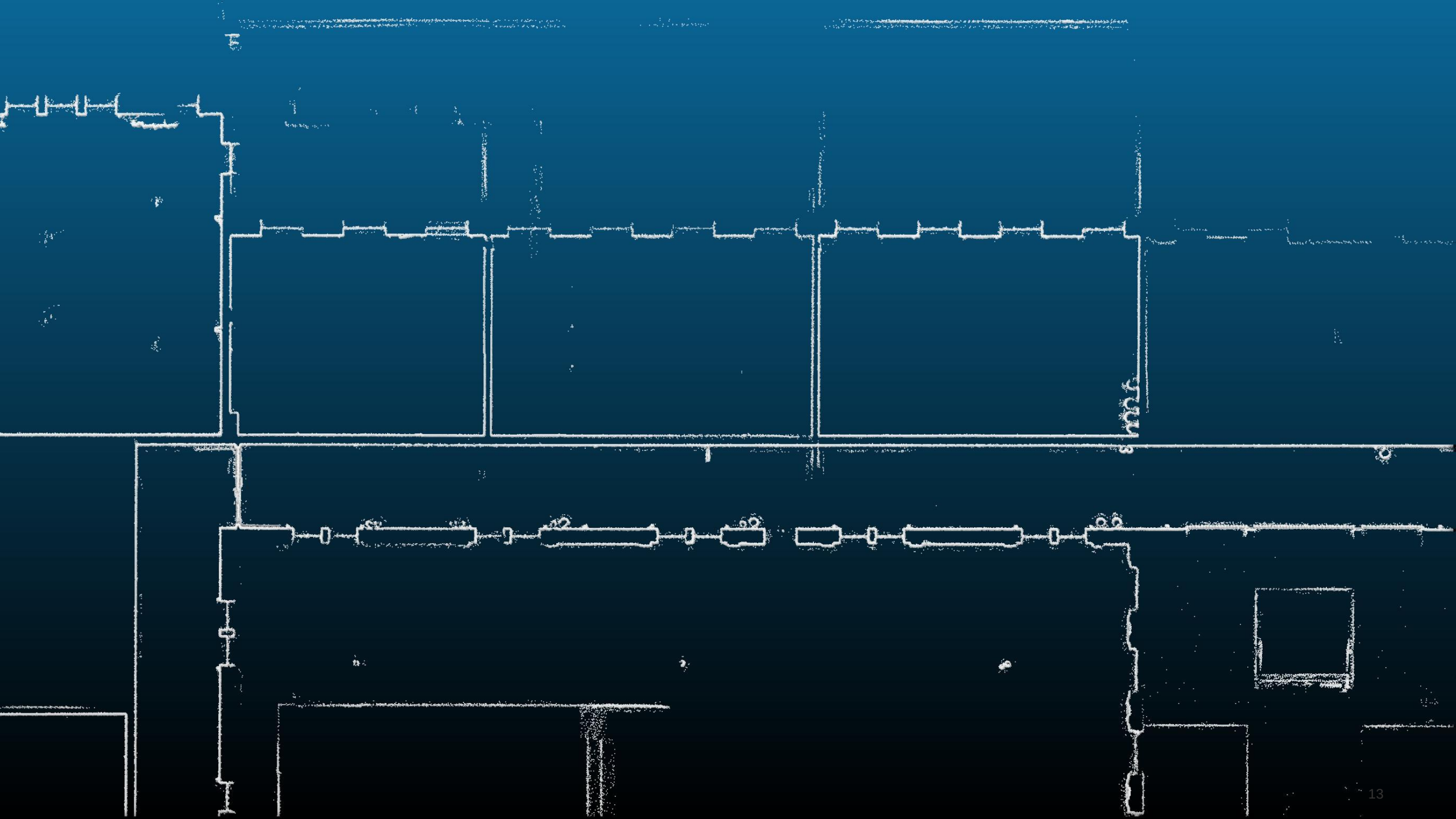


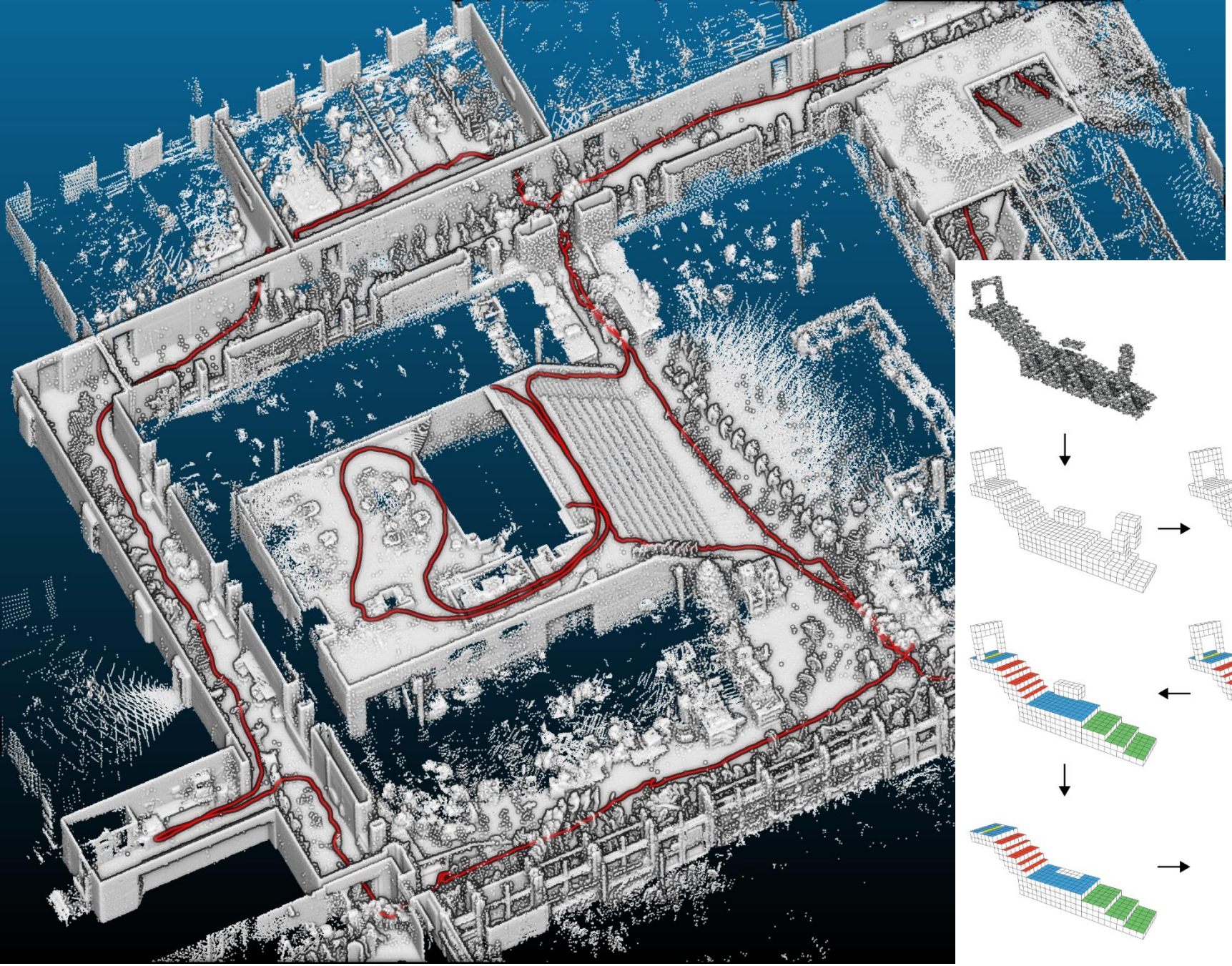
Why a MLS?

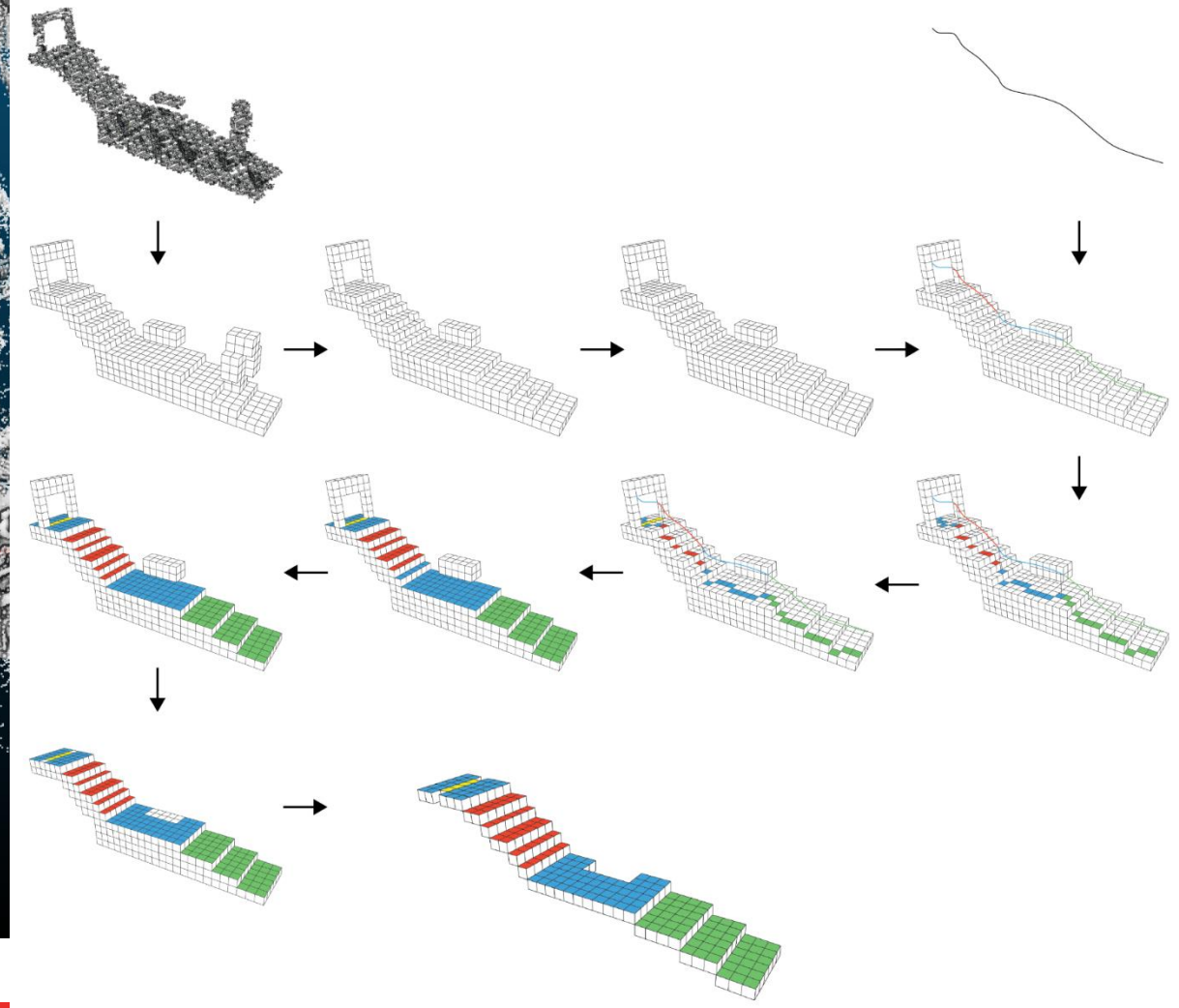
- Fast
- Flexible
- Accurate enough

Delivers:

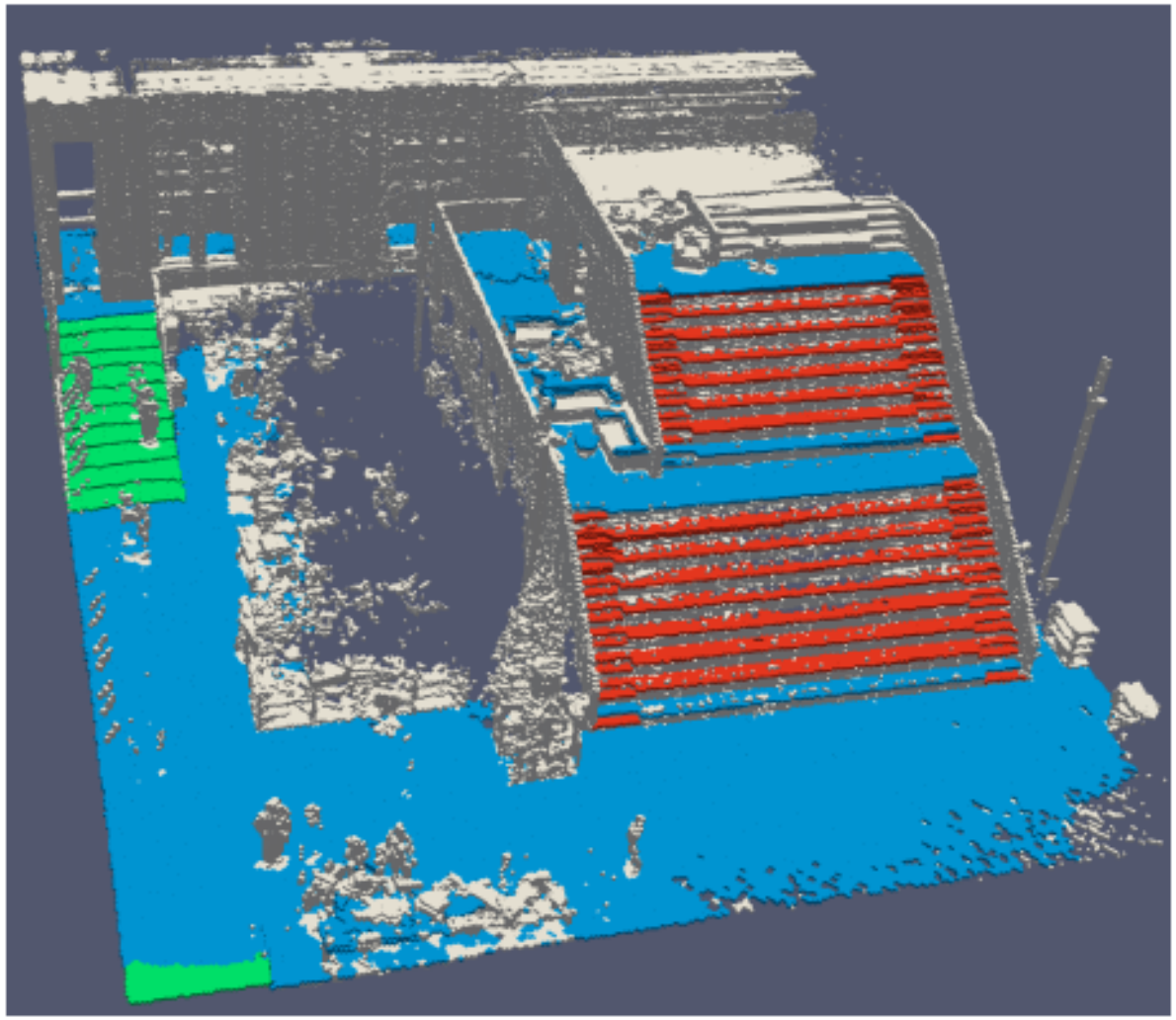
- Pointcloud
- Coordinates

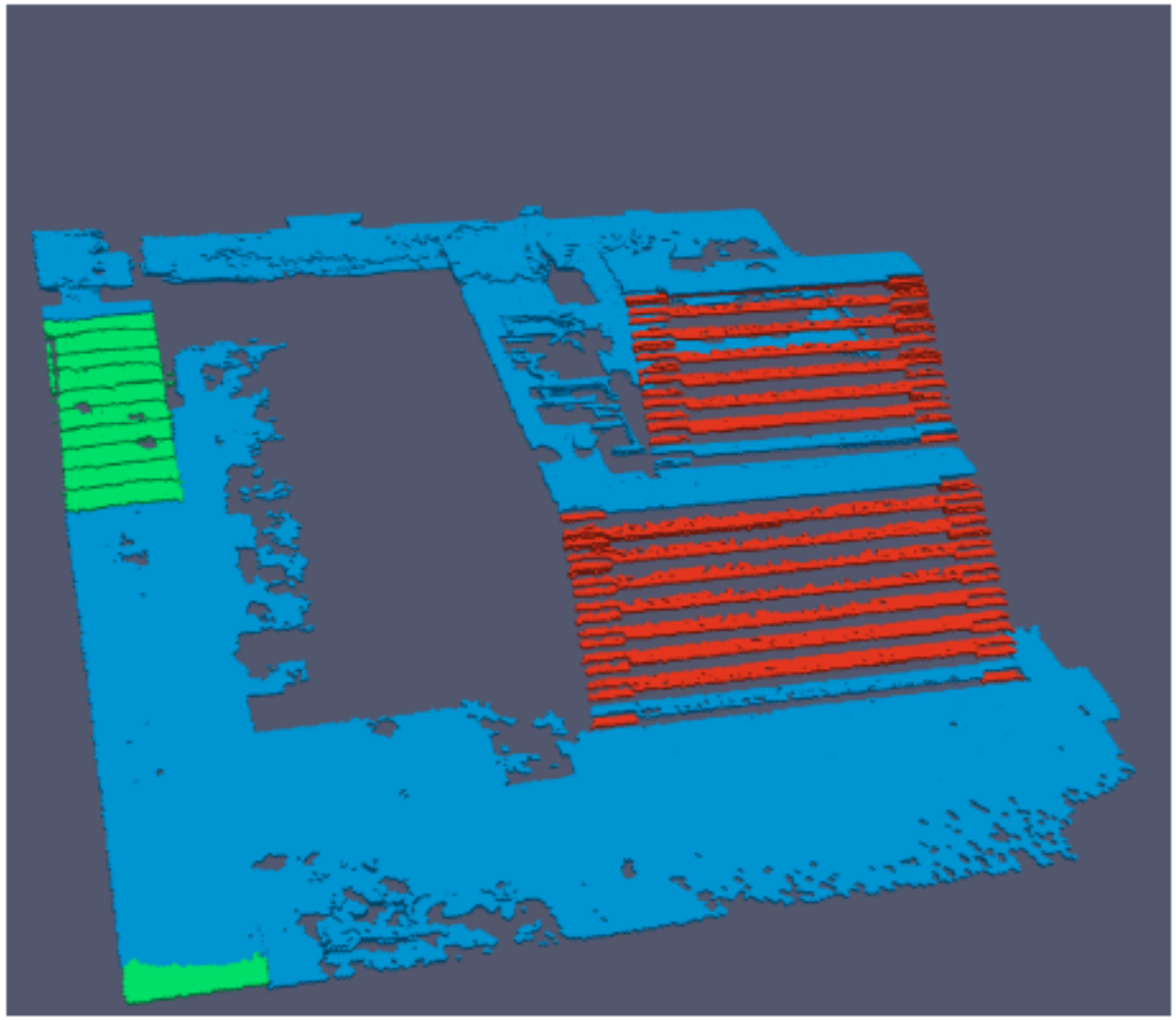




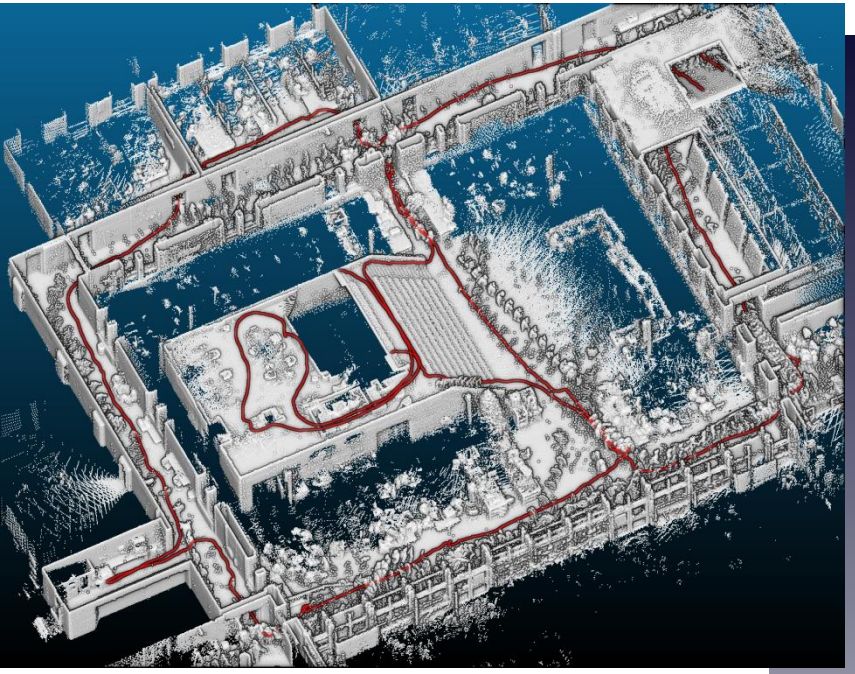


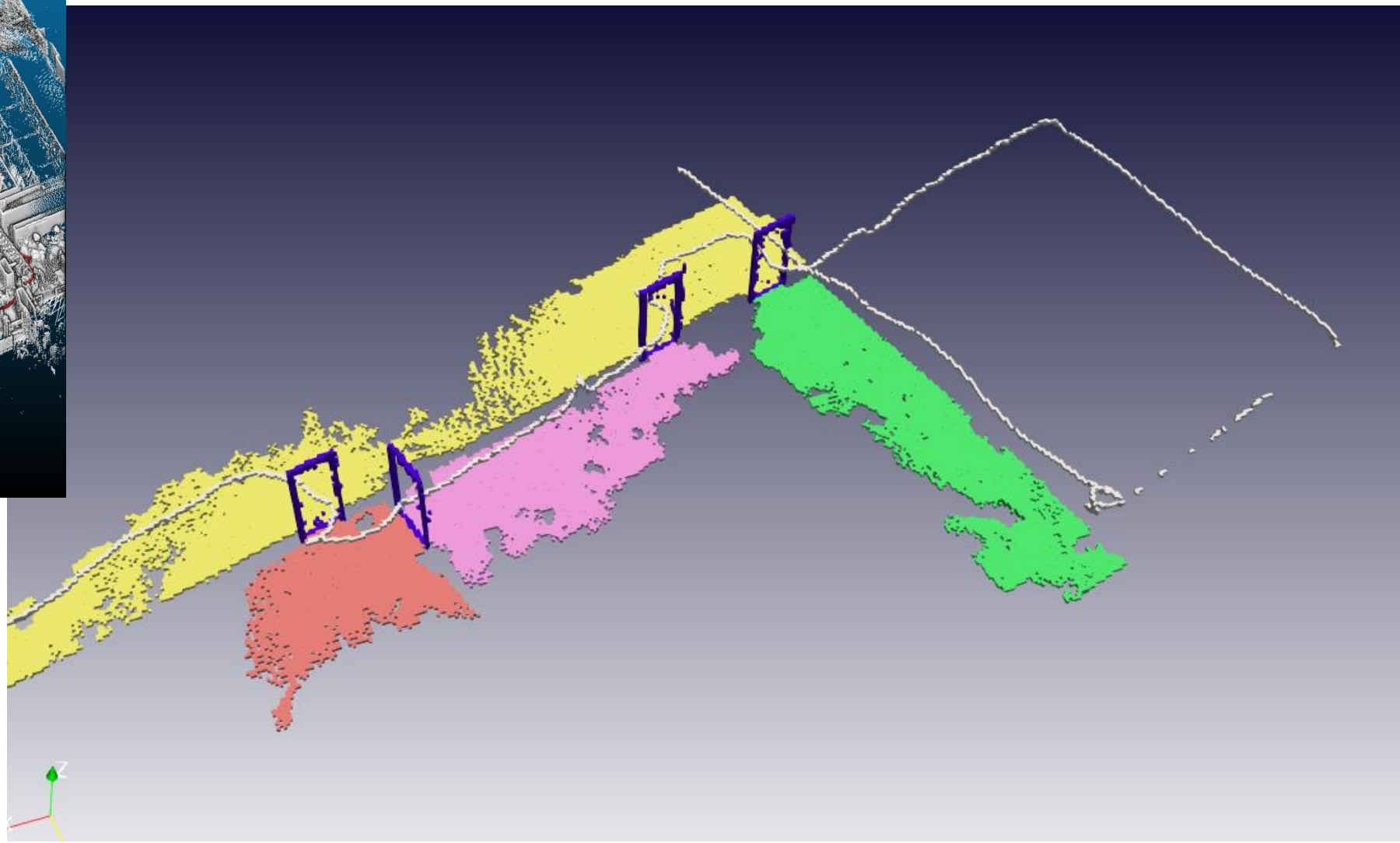
Results





Room segmentation





GIS, BIM, and Indoor Ma | OGC® IndoorGML | OGC | IndoorGML OGC

Niet beveiligd | www.indoorgml.net

Apps | CGI Application Catal | CGI CIO Service Desk | CGI Remote Access | CGI - Enterprise Porta | CGI Remote Access (I | FACILITOR® | My Site | Geïmporteerd uit Inte | Caren Zorgt | Nieuw tabblad | Andere bladwijzers

IndoorGML

OGC Standard for Indoor Spatial Information

DOCUMENT SCHEMAS

What is IndoorGML?

IndoorGML is an OGC standard for an open data model and XML schema for indoor spatial information. It aims to provide a common framework of representation and exchange of indoor spatial information. It is defined as an application schema of OGC Geographic Markup Language (GML) 3.2.1.

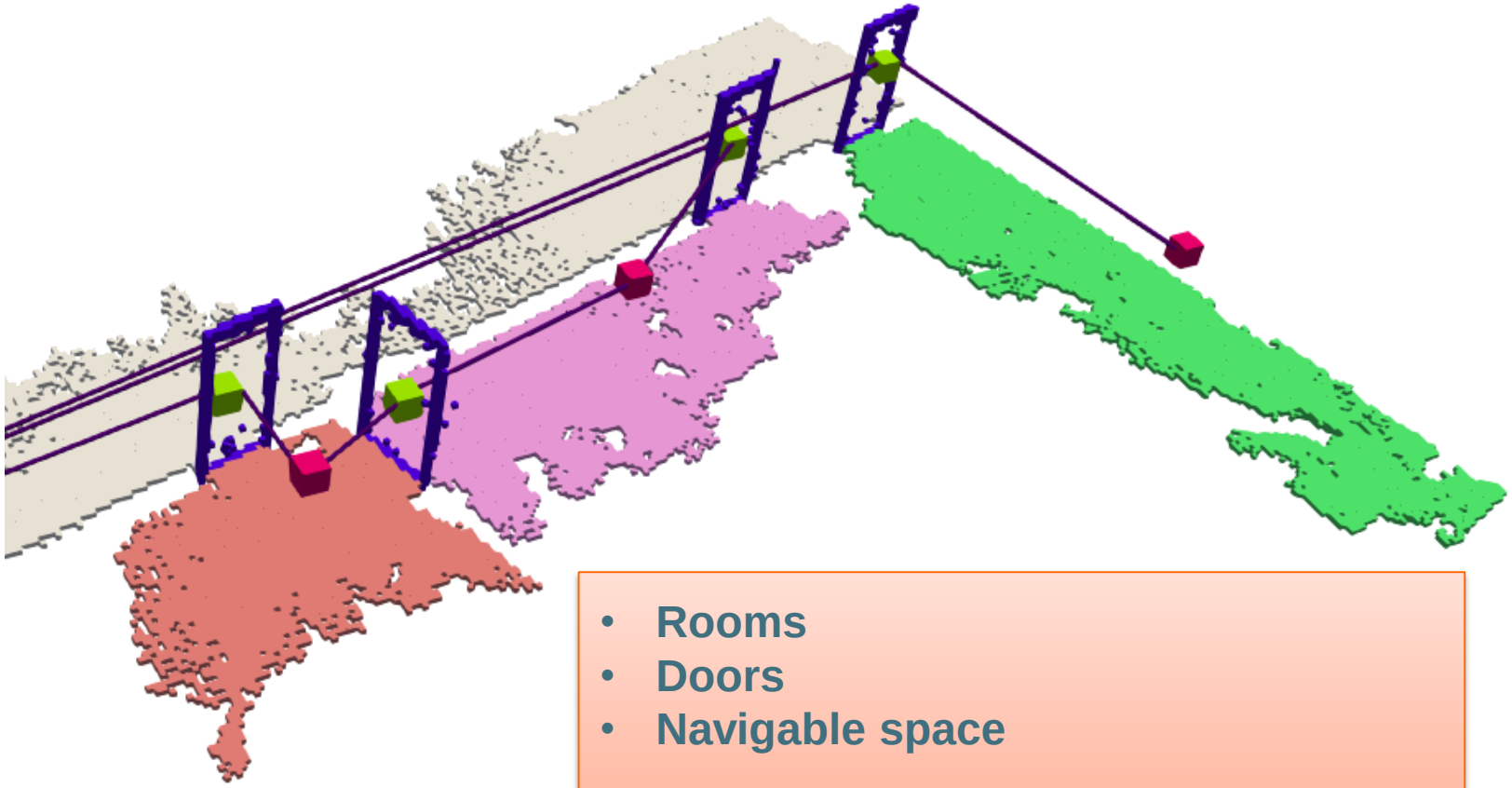
Understanding IndoorGML

1. Motivations

ArcGIS Indoorsdev....pdf

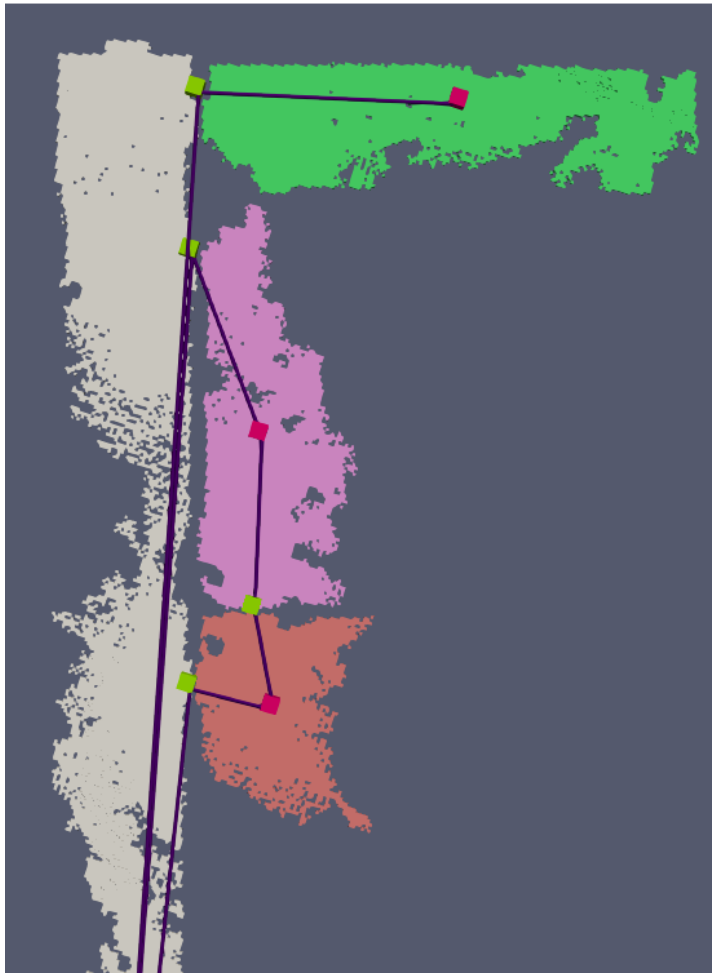
Alles weergeven

Nodes generation



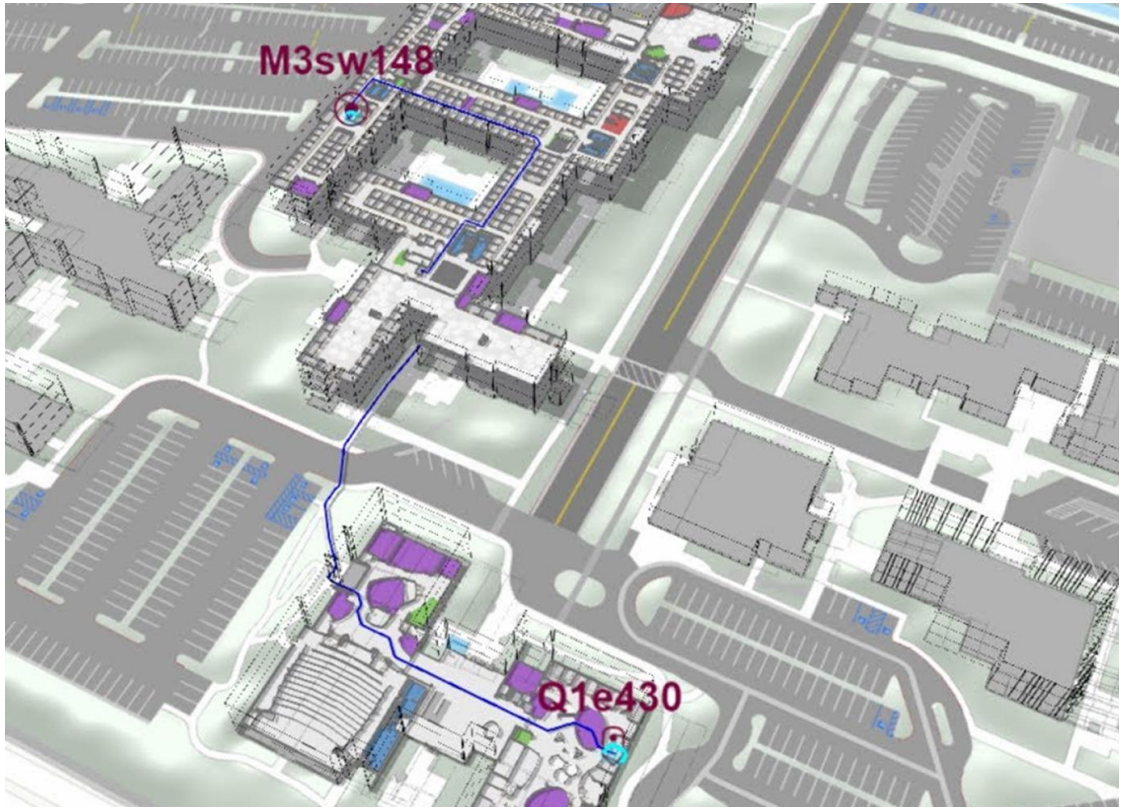
- Rooms
- Doors
- Navigable space

→ IndoorGML
→ Clean model with only nodes needed

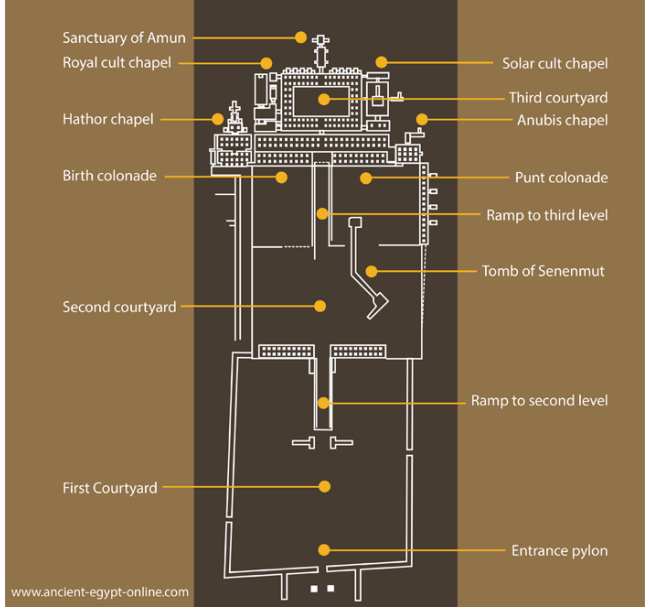


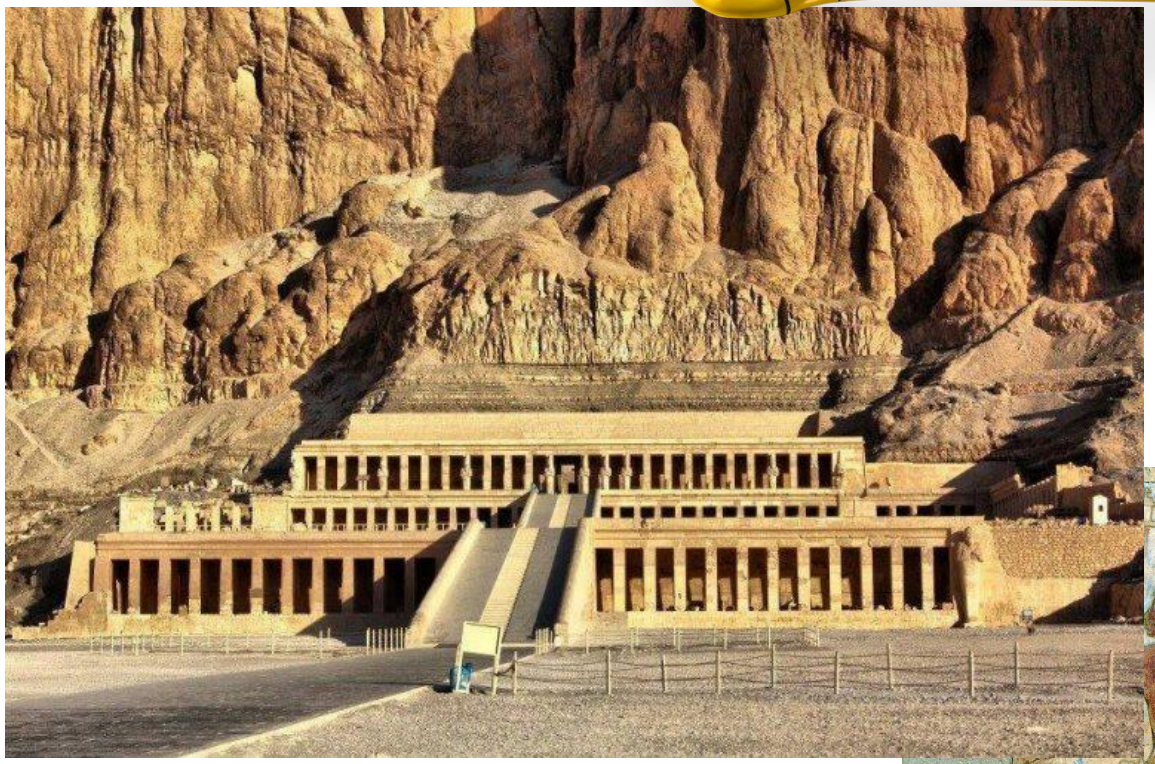
Future research

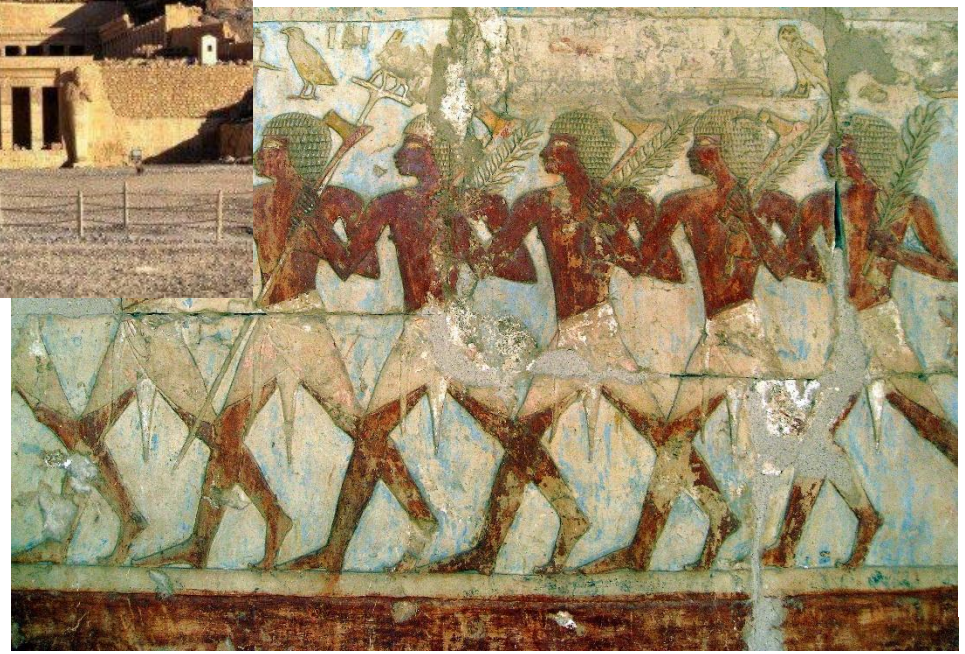
- Continuous coordinate systems
  - Finding geodetic ways to merge an indoor pointcloud into its real world coordinates
- Testing IndoorGML in a real app and real environment
- Adding elevators to our algorithms
- Adding hybrid navigation



Future work?







Confidential

Contact me to continue the conversation.

Robert Voûte
Vice President Consulting - Expert
robert.voute@cgi.com
+31 6 226 113 91
https://nl.linkedin.com/in/robert-voûte-5508b08