

A 3D map platform for supporting safe mobility



*Data Platform
Research Team*

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Maps

Geospatial data and information
Where and what exists

2D

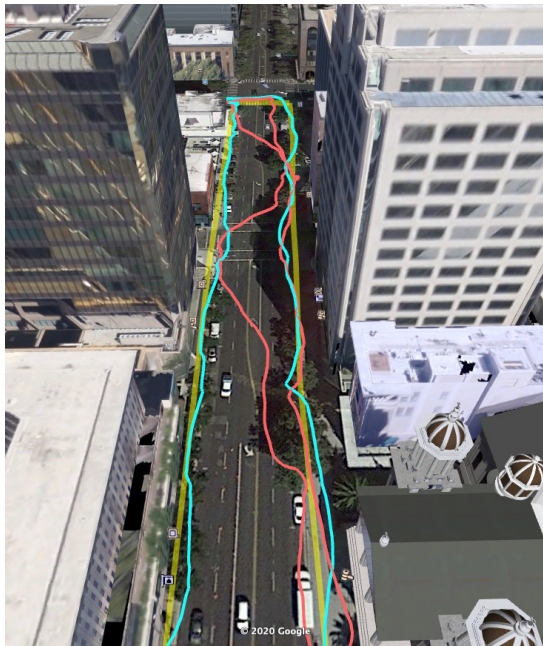


3D



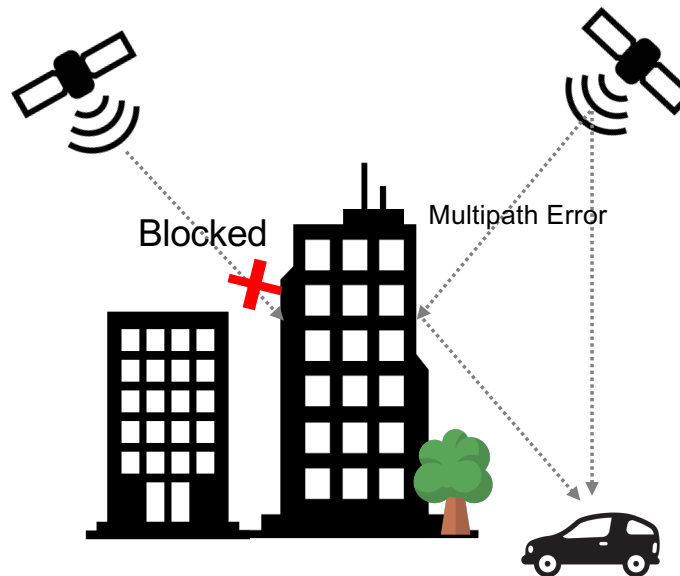
Why 3D Map?

More accurate locations



Red = without 3D mapping aided corrections,
Blue = with 3D mapping aided corrections

[Source] <https://android-developers.googleblog.com/2020/12/improving-urban-gps-accuracy-for-your.html>



Safer and more secure mobility



[Source] <https://americanhistory.si.edu/blog/smashing-barriers-access-disability-activism-and-curb-cuts>

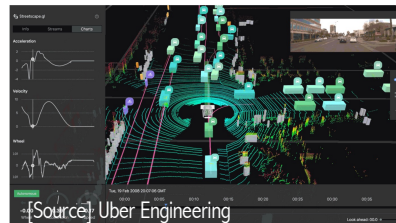


Tactile paving

[Source]
https://wiki.openstreetmap.org/wiki/File:Tactile_paving.jpg

Applications based on 3D Maps

**Autonomous driving
cars/robots**



[Source] <https://news.livedoor.com/article/detail/18764375/?fbclid=IwAR2QlgHTso9JPrzCrYliaioOLmBjhRNemTN5EQL8voT1YaYCSweRJ9fdlmw>

**Personal
experience augmentation**

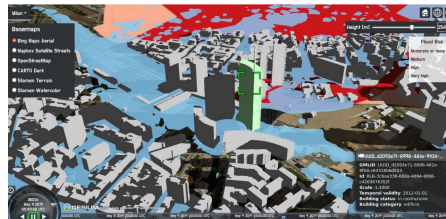


[Source] <https://www.youtube.com/watch?v=eQXKErrHMxw&app=desktop>

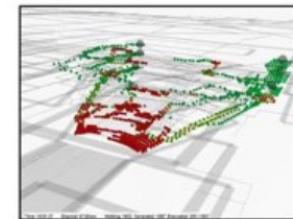


[Source] <https://www.businessmaas.com/data/%E2%80%8B8Btoyotas-e-palette-5-reasons-reinvent-commerce/>

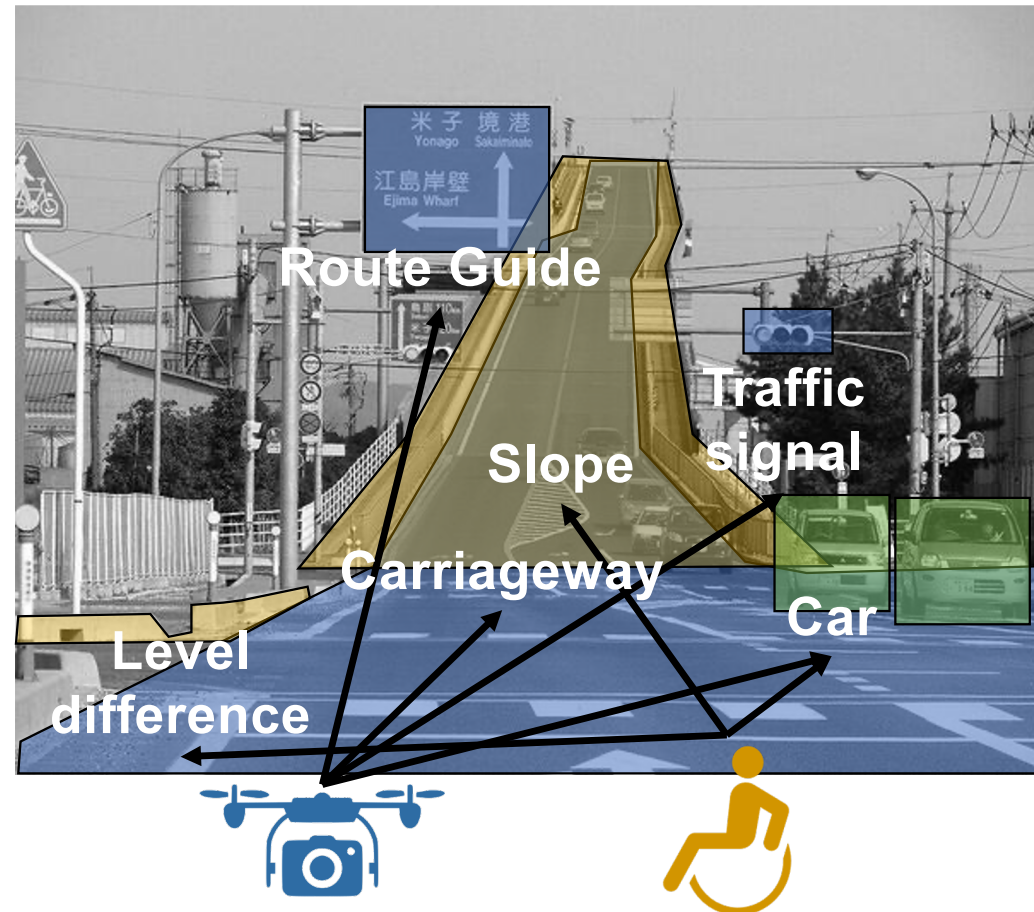
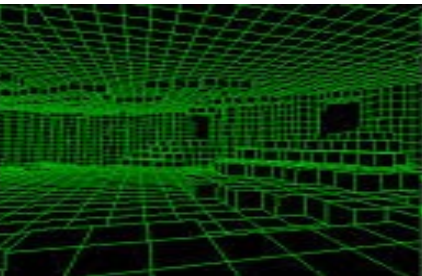
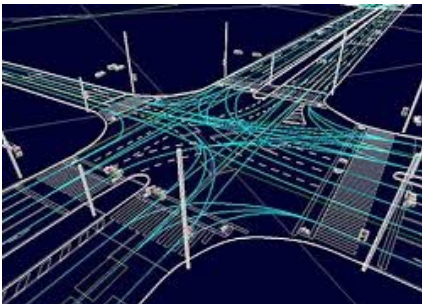
**Sustainable
urban planning/
Disaster management**



[Source] <http://www.urbangeobigdata.it/wp-content/uploads/2019/07/GEORES.pdf>

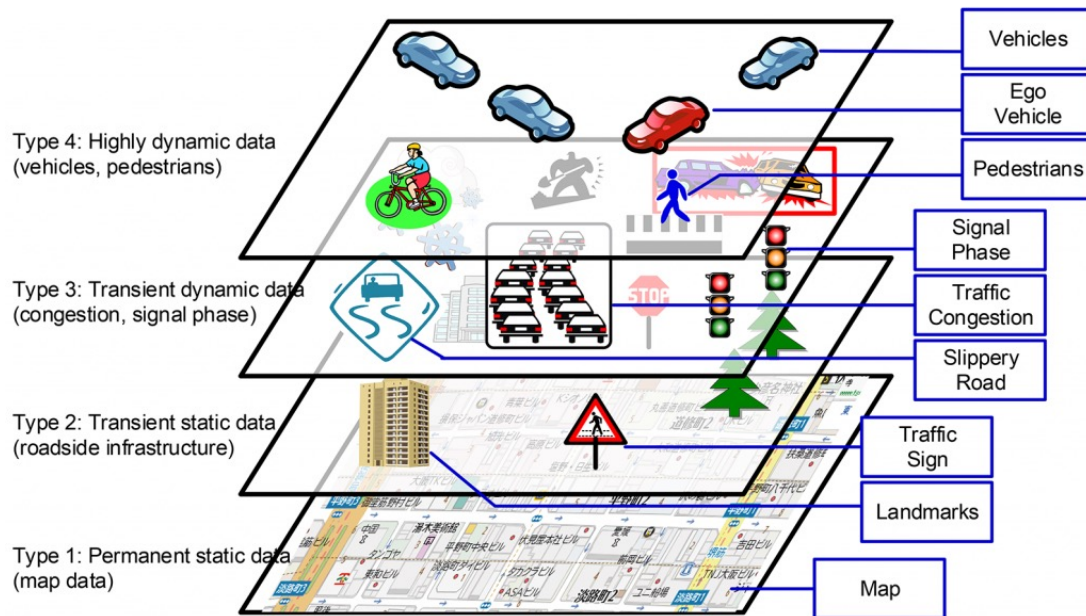


Different requirements

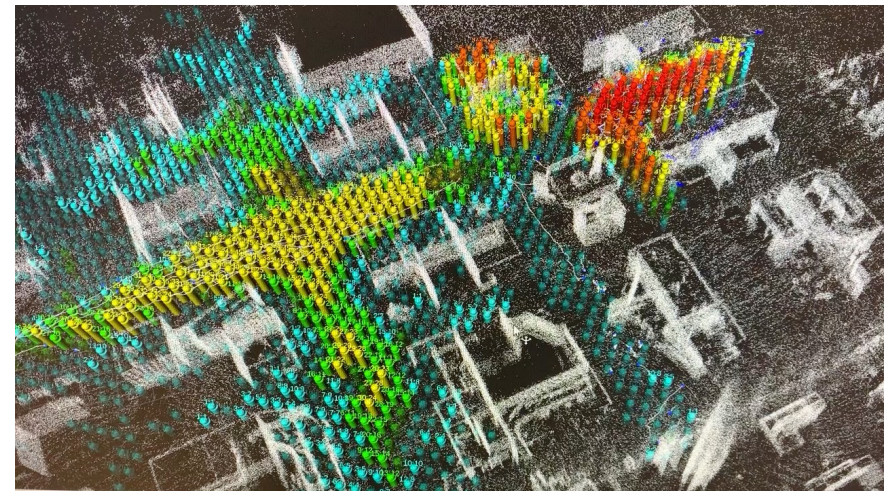


Dynamic 3D Maps

Local Dynamic Map



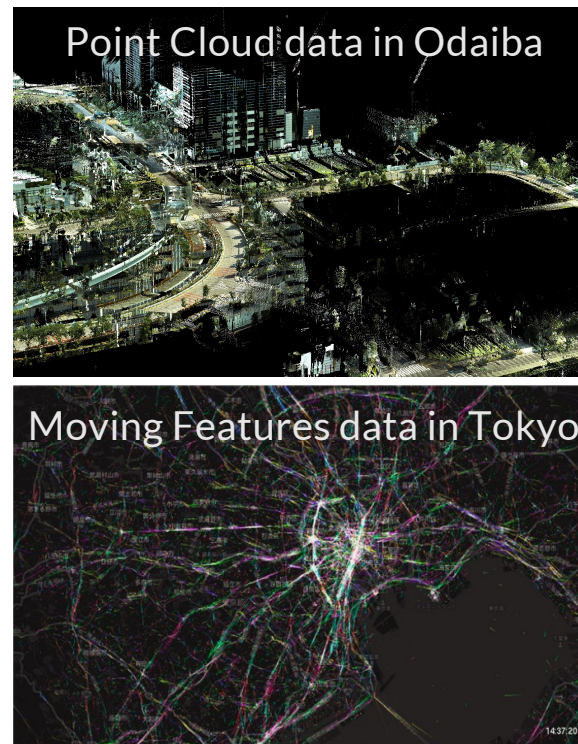
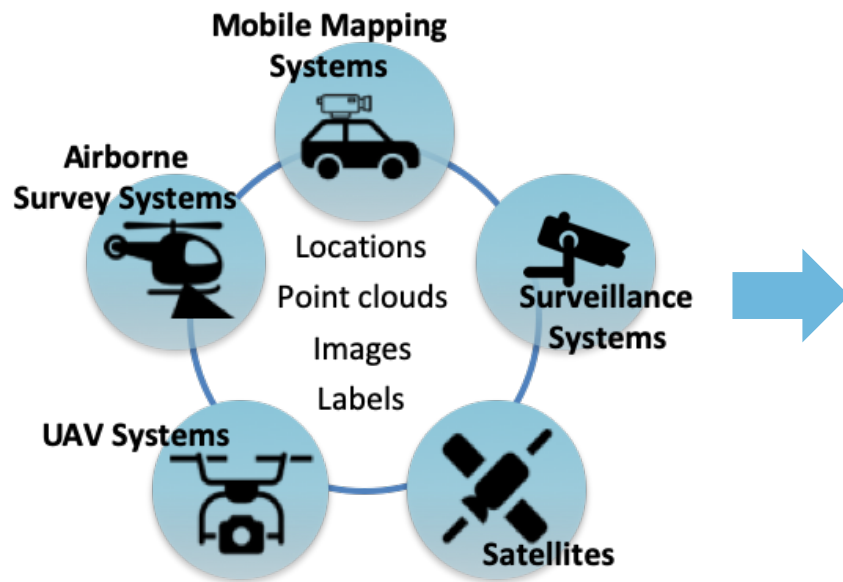
Traffic(Pedestrian) Congestion Map



[Source] https://www.scirp.org/pdf/JTTs_2015033117331447.pdf

Big Geospatial Data

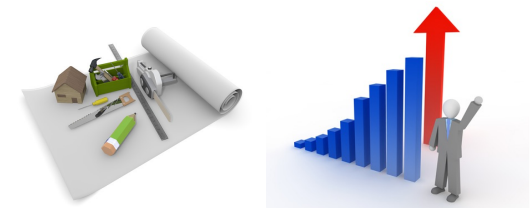
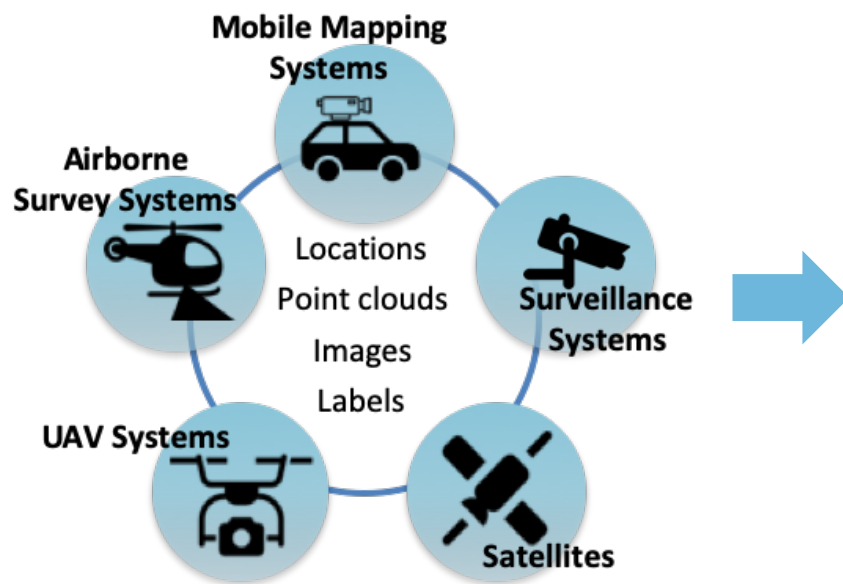
Generating a 3D map from a large amount of raw 3D point cloud data and human mobility data obtained by heterogeneous sensor devices:



- Volume
- Variety
- Variability
- Velocity
- Veracity

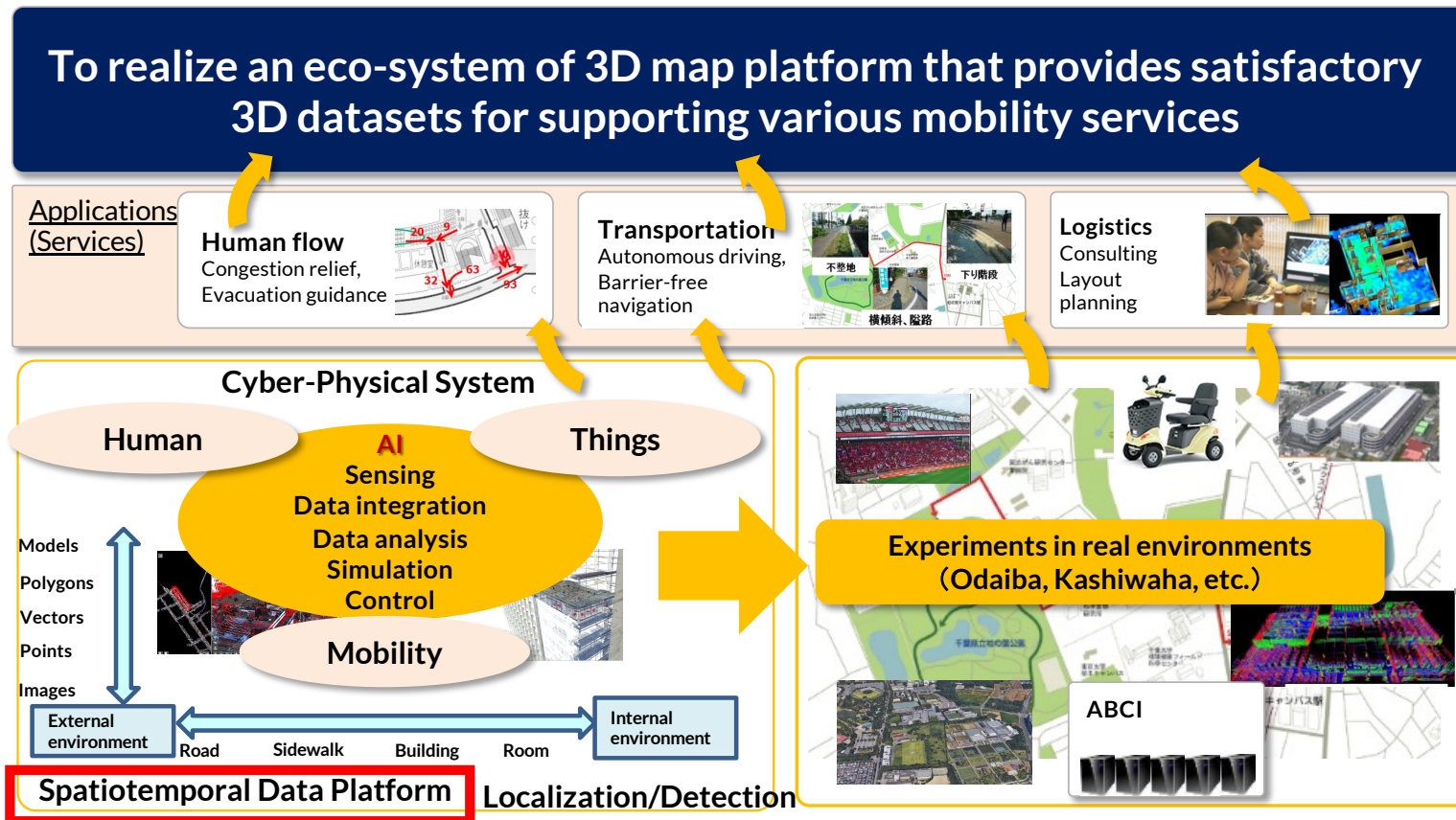
Cost

Generating a 3D map from a large amount of raw 3D point cloud data and human mobility data obtained by heterogenous sensor devices:



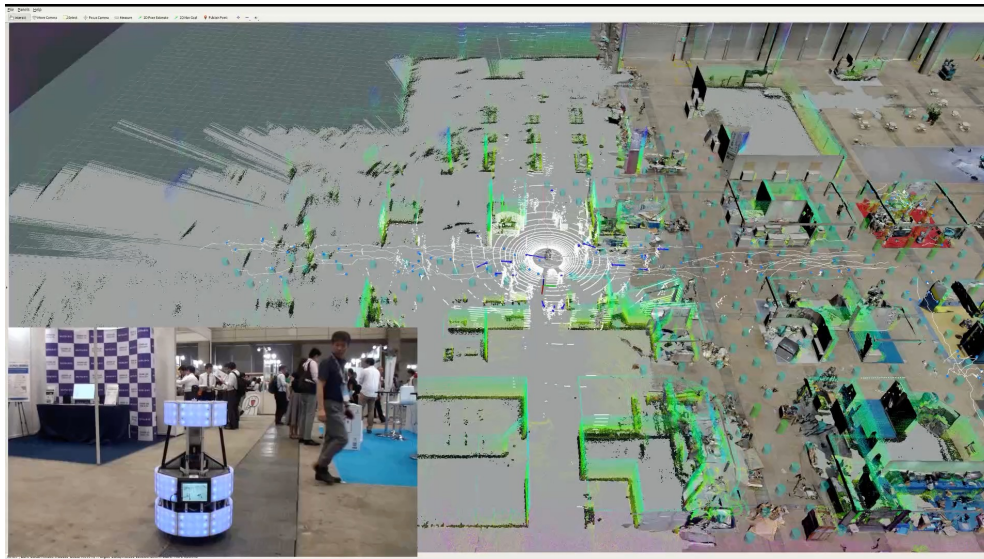
It is too expensive to construct comprehensive and highly accurate 3D geospatial information by considering all utilization in advance!

NEDO : A 3D map platform for supporting safe and secure mobility



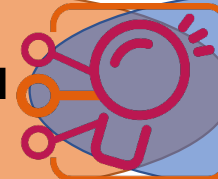
PntML : AI-powered Geospatial Data Platform

Analysis and prediction



(Place-Time for Machine Learning)

Static
geospatial
data



Dynamic
geospatial
data

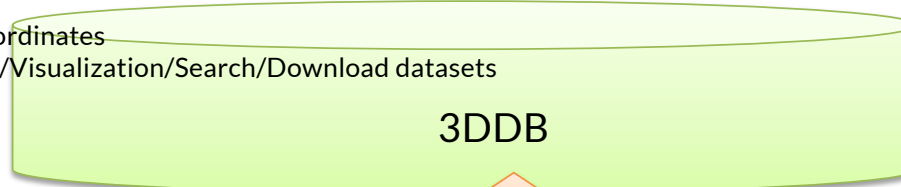
PntML

- 1) A data platform that can easily and automatically generate, link, and share "appropriate" 3D geospatial data specialized for individual needs.
- 2) The platform can accumulate and manage large amounts of real-time data of moving features (objects) such as traveling vehicle data and flow of people, also analyze and predict the congestion areas given a time resolution.

sensor data



- Align the coordinates
- Registration/Visualization/Search/Download datasets



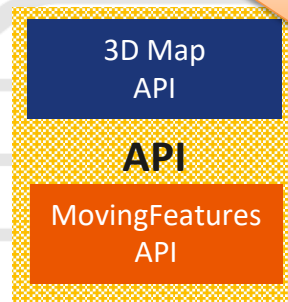
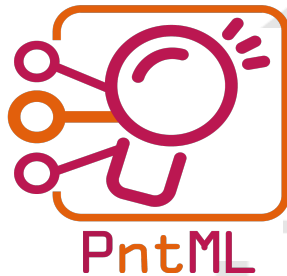
3DDB viewer based on Cesium

AR marker positioning technology



3D position

Mobile apps



Modules

- Semantic segmentation
- Finding planar wall surfaces
- Making 3D Model
- Aggregation
- Prediction

Safe driving simulation of personal mobility in a virtual space



Autonomous driving in any place



Crowd flow monitoring and simulation for disaster/event management



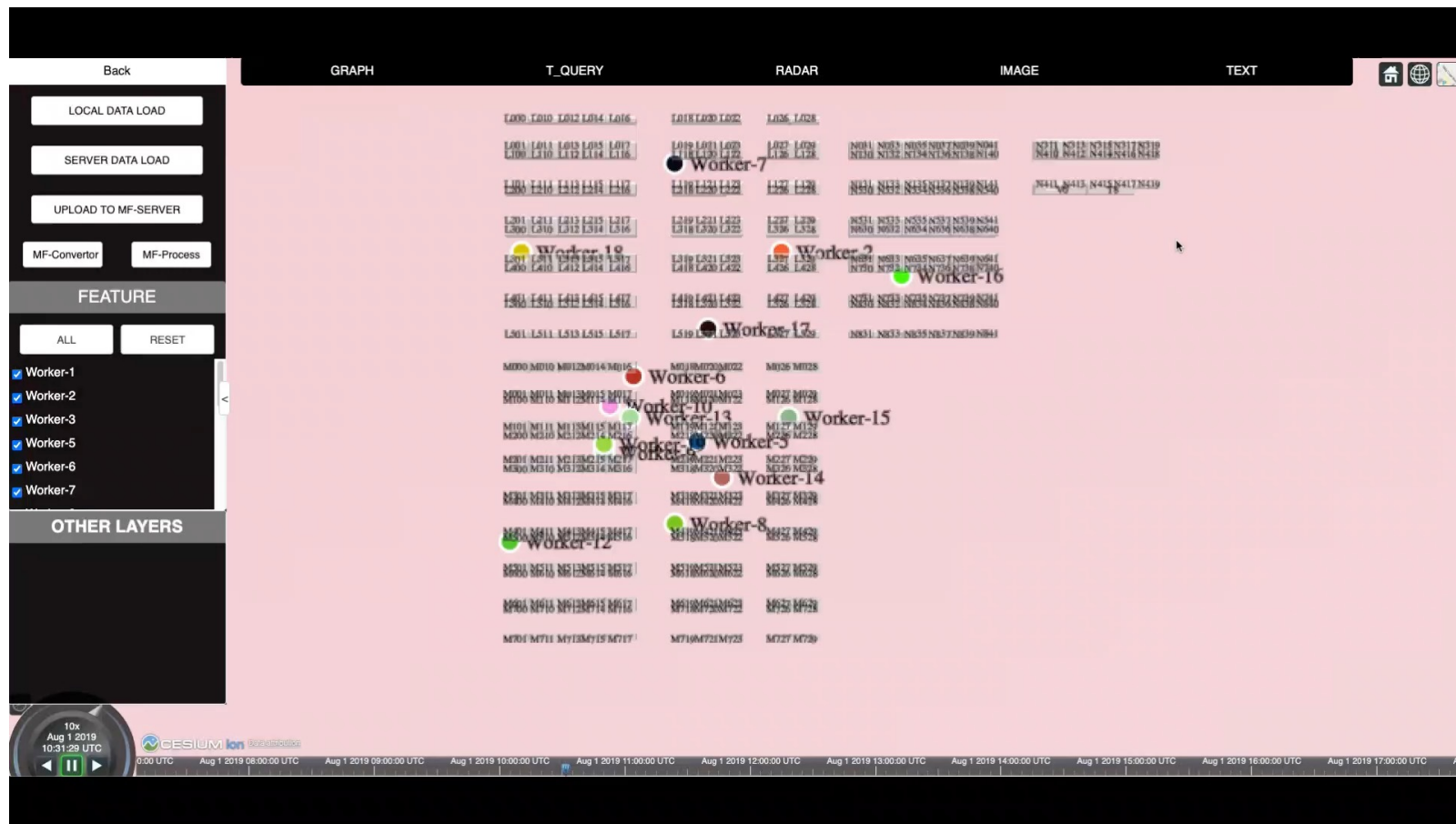
Worker flows analysis and optimization in a warehouse







物流倉庫の作業者動線・滞在時間解析





Automatic generation 3D GIS models

Thank you for your attention!

