GeoAnalytics: an Overview

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What we do in data fusion?
It's all about enriching the data!

Level 0 | Source Preprocessing
Data alignment, denoising, segmentation, ...

Level 1 | Object Assessment
Feature extraction, semantic labelling, object recognition, ...

Level 2 | Situation Assessment
Structured context representation and analytics

Level 3 | Impact Assessment
Predictive analytics and decision support
Creating accurate replicas of real-world …
ION platform takes care of spatial and temporal alignment of data sources and streams!

Building AI with the support of spatio-temporal analytics

- **Data sources:** Copernicus, LiDAR, IoT, mobile devices, open weather data, ...
- **Data analytics technology stack:** Semantic labeling, context assessment, environmental simulations, feature (deep) learning, ...
- **Advance visualization:** Holograms, augmented and virtual reality, ...
Level 0 | Data structuring

Hierarchical segmentation

- The whole dataset at root
- Pairs of points at leaves

Distances on geometric and intensity information

Every cut guarantees the most expensive edge is removed

- Select regions by arbitrary attributes
Still amongst best in the world according to the official benchmark of International Society of Photogrammetry and Remote sensing

Semantic labelling:

- DTM
- Ground Buildings
- Vegetation
- Individual trees
- Accuracy of over 90%

EXAMPLE: Ground recognition / denoising
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EXAMPLE: Ground recognition / denoising
EXAMPLE: Ground recognition / denoising
EXAMPLE: Object recognition

LEGEND
Light Green – Grass
Dark Green - Trees
Red – Buildings
Yellow – Powerlines
EXAMPLE: Object recognition

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EXAMPLE: Individual trees
EXAMPLE: Individual trees
EXAMPLE: Infrastructure monitoring

- [Crocodile] cracking:
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- Mapping of traffic signs, curbs, road railing, …
Level 1-2 | Infrastructural monitoring

Assessing objects and their positions

Some applications:

- Detection of crocodile cracks
- Encroaching vegetation assessment
- Electricity production
Level 2 | Solar potential

With partner GeoDirectory

Mapping of:

- Buildings
- Rooftop orientations
- Optimizations of slopes and orientations
- Testcase: Neven
Level 2 | Car infotainment systems

Dream Drive Platform

Bringing together all data for ultimate travelling experience

- Game design around real-world objects
- Social interaction
- Trivia games
- Driving skills games
- Speed, road signs, ...

Voice controlled browsing through menus
Level 2-3 | Supercars and rocket lunching systems

Remote diagnostics and optimisation

Remote diagnostics

- Automatic ordering of services
- Adjustments of parameters: suspension, deferential, ...
- Monitoring of drivers performances
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Level 3 | Predictive analytics

Digital twins

City traffic
- PM10 particle predictions
- Changes of traffic flows when changing green light intervals, ...

Farm management
- Assessment of soil-health parameters
- Competition between plants
- Plant development predictions ...

Human muscles
- Technology stack for assessment of neuromuscular behaviour in real environments