Activities of Laboratory on Geoinformatics and Cartography

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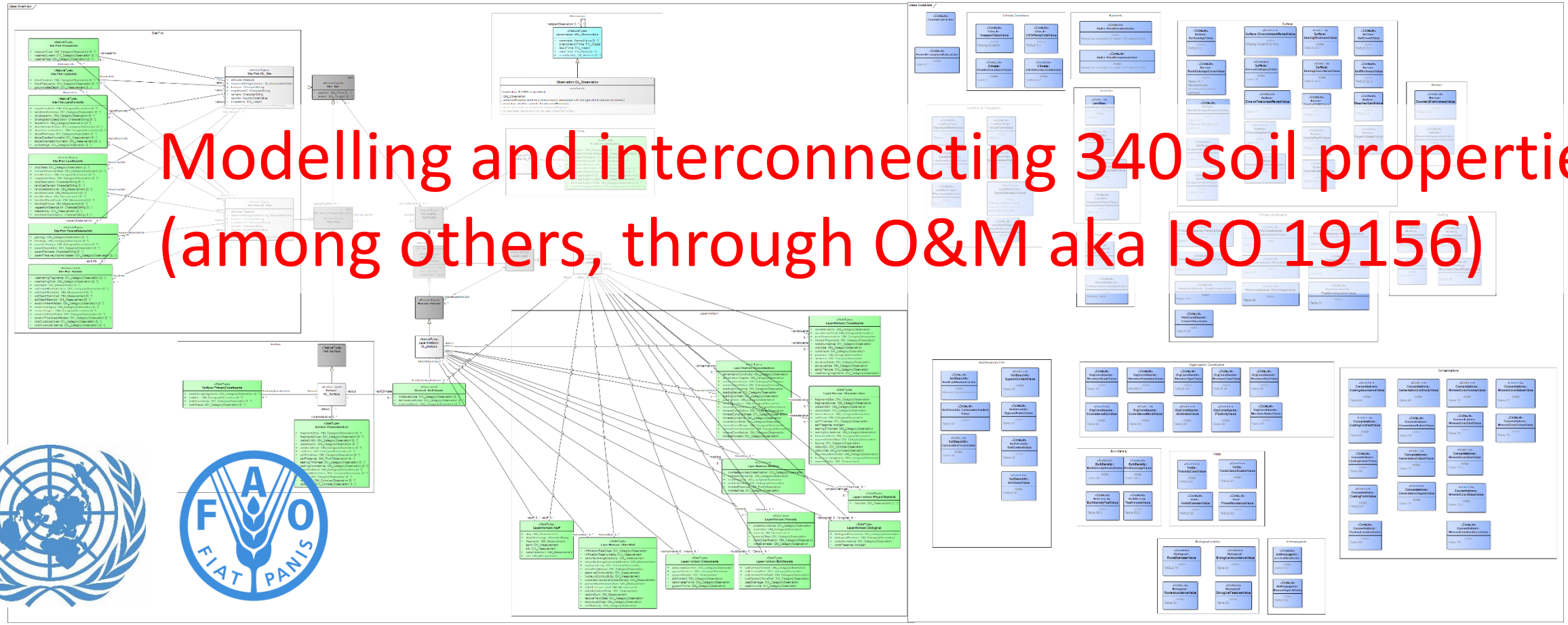
Laboratory on Geoinformatics and Cartography (LGC) in a nutshell

- The first text-book on Geographical Information Systems ever (1985)
- Laboratory founded in 1992
- Member of Open Geospatial Consortium
- 4 running projects directly by the LGC and 4 within the living lab called „Wirelessinfo“
  - 5 Horizon 2020 projects running simultaneously right now

SIEUSOIL EO4AGRI EUXDAT STARGATE enabling

U.N. FAO consultancy – Soil Data Model (GloSIS)



Modelling and interconnecting 340 soil properties (among others, through O&M aka ISO 19156)

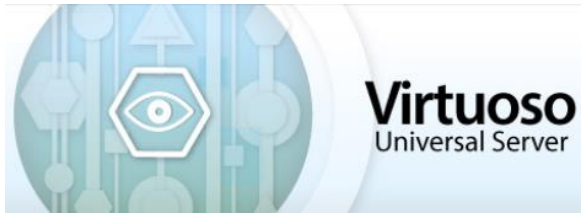
Latest SIEUSOIL work – Semantization

Massive data transformation into RDF

Loading datasets in Virtuoso

Linking of datasets

Query building

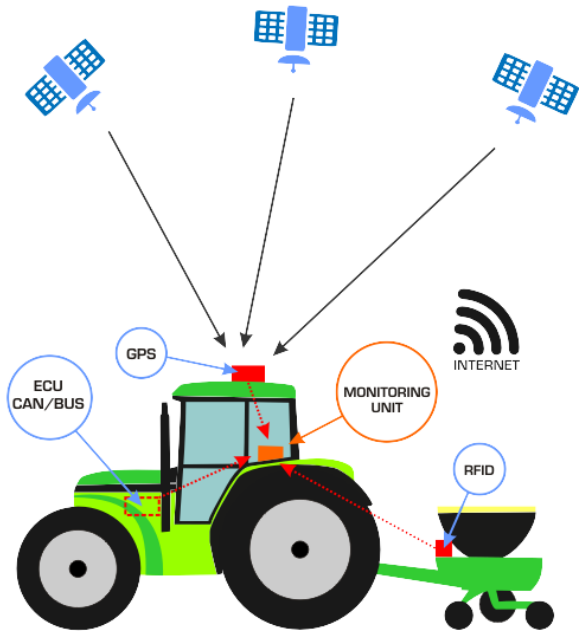


Freely accessible endpoint coming soon

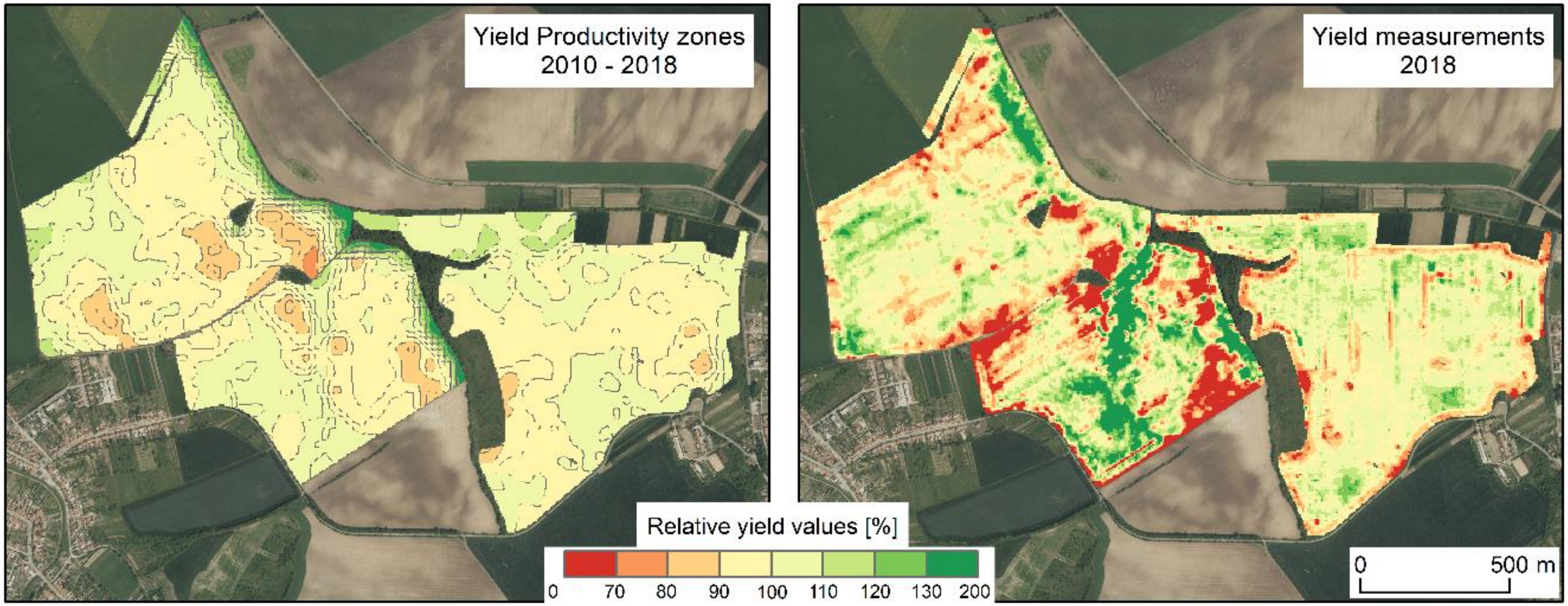
Farm Machinery Measurements

- Second-by-second measurements (about 60 attributes each second)
- Continuous monitoring since 2015

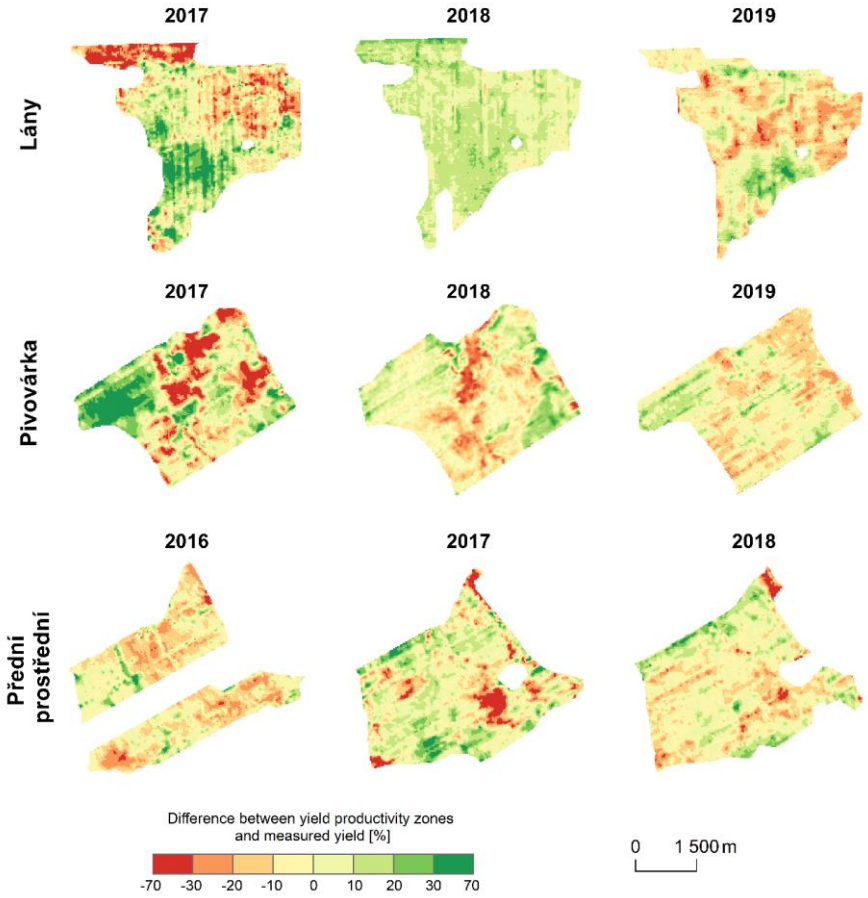
Image adopted from: https://www.lectura-specs.com

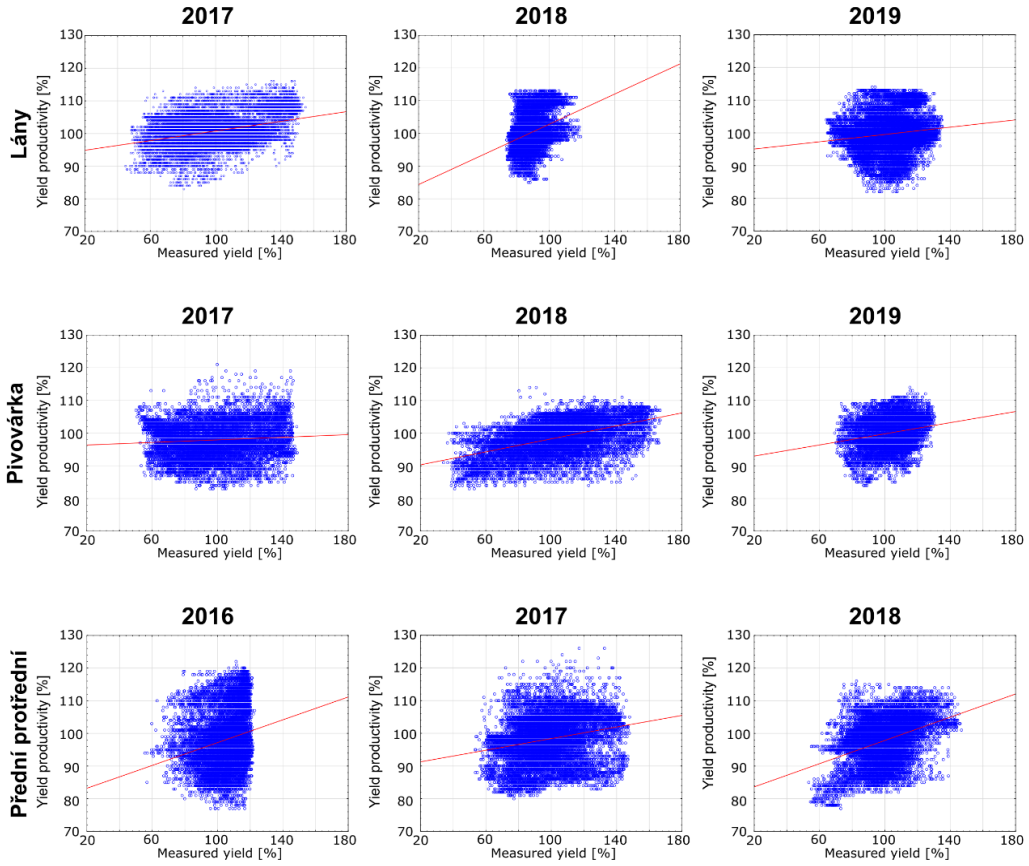


Yield Predictions with 95% Sucess (Spatially)

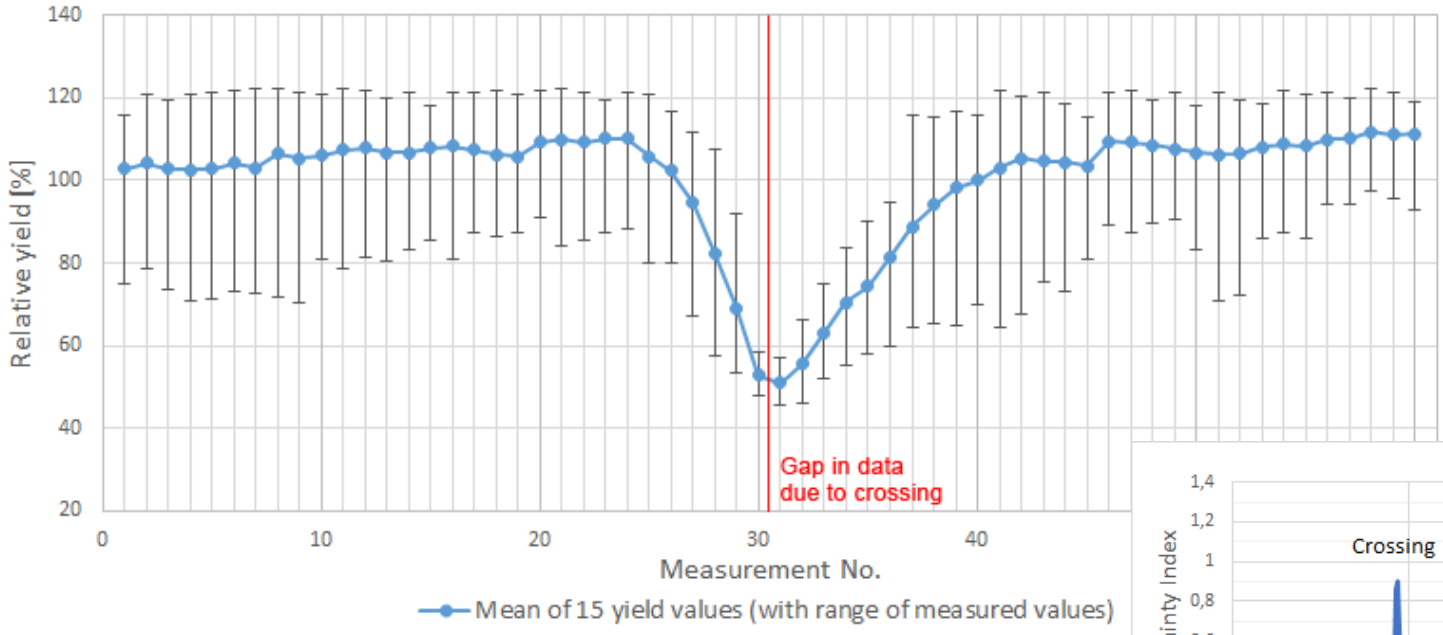


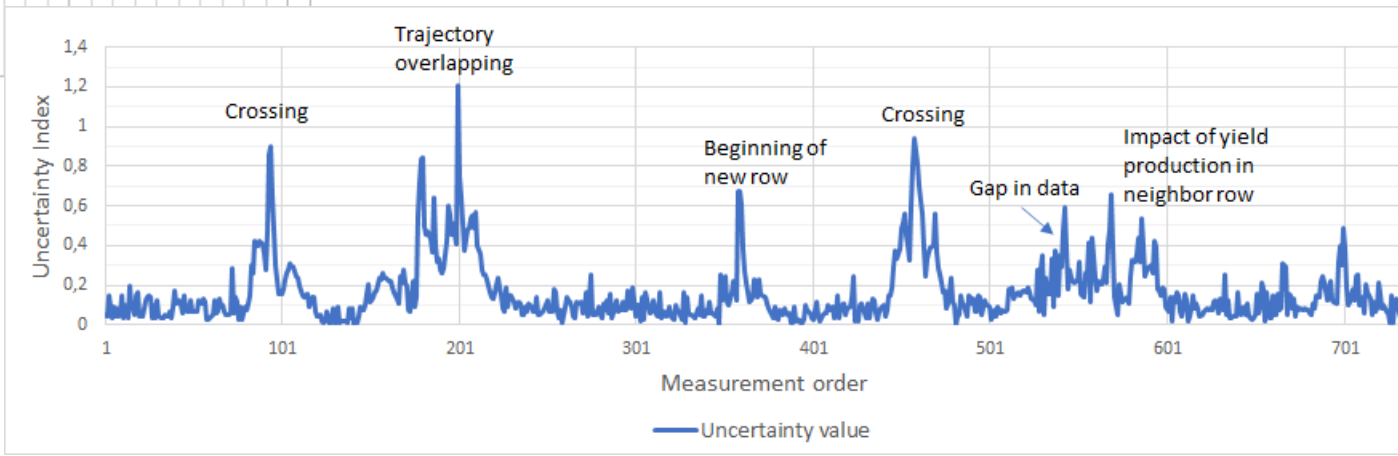
Evaluations of Yield Predictions



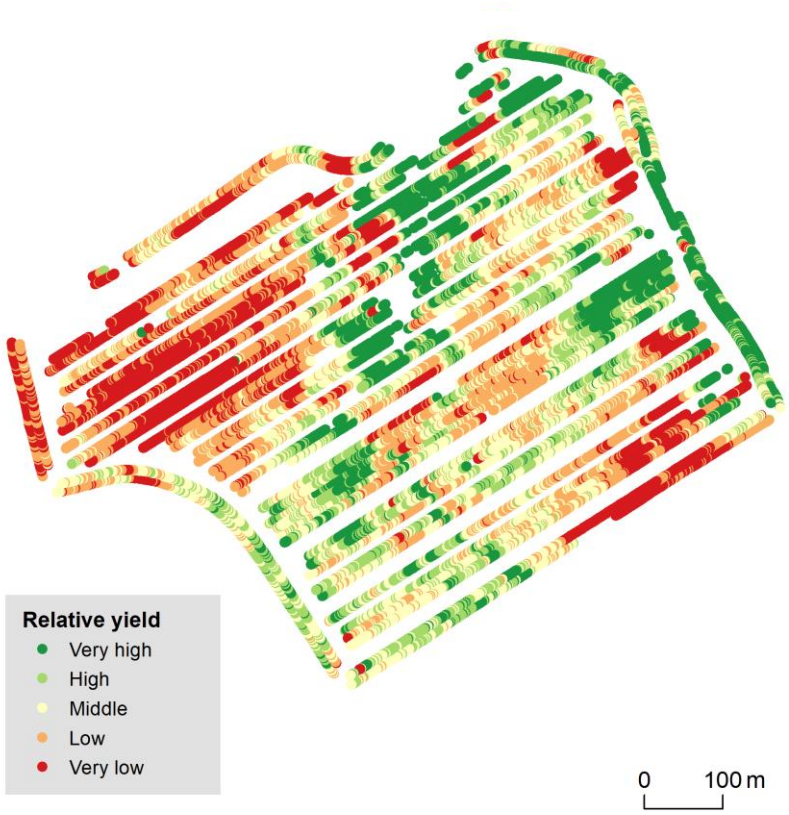


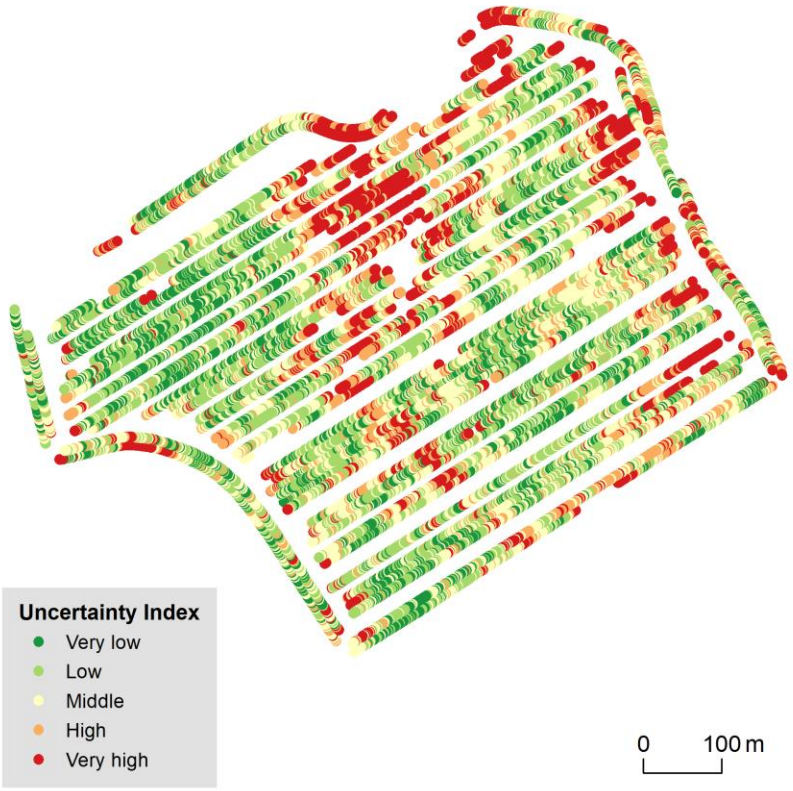
Uncertainty definitions…

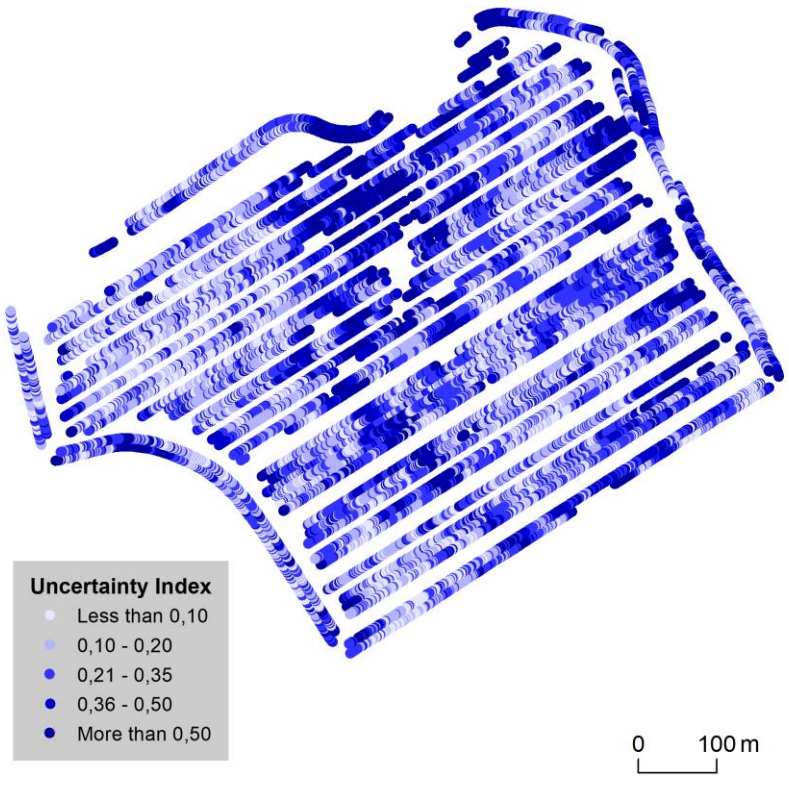




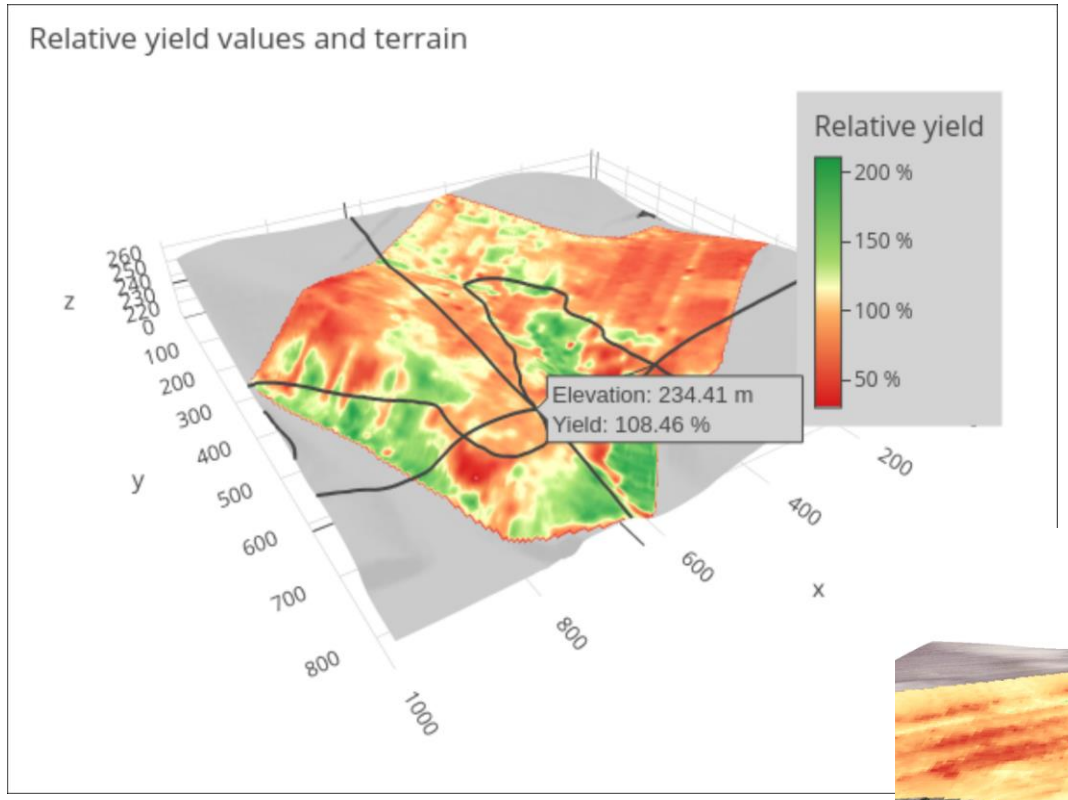
… and uncertainty visualizations…

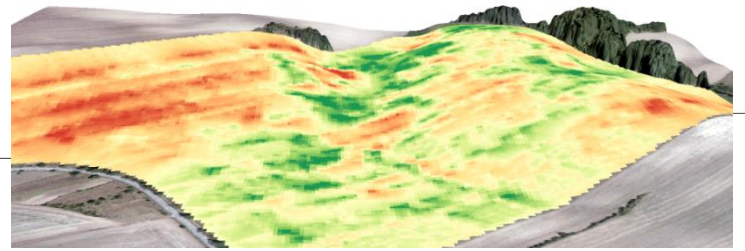


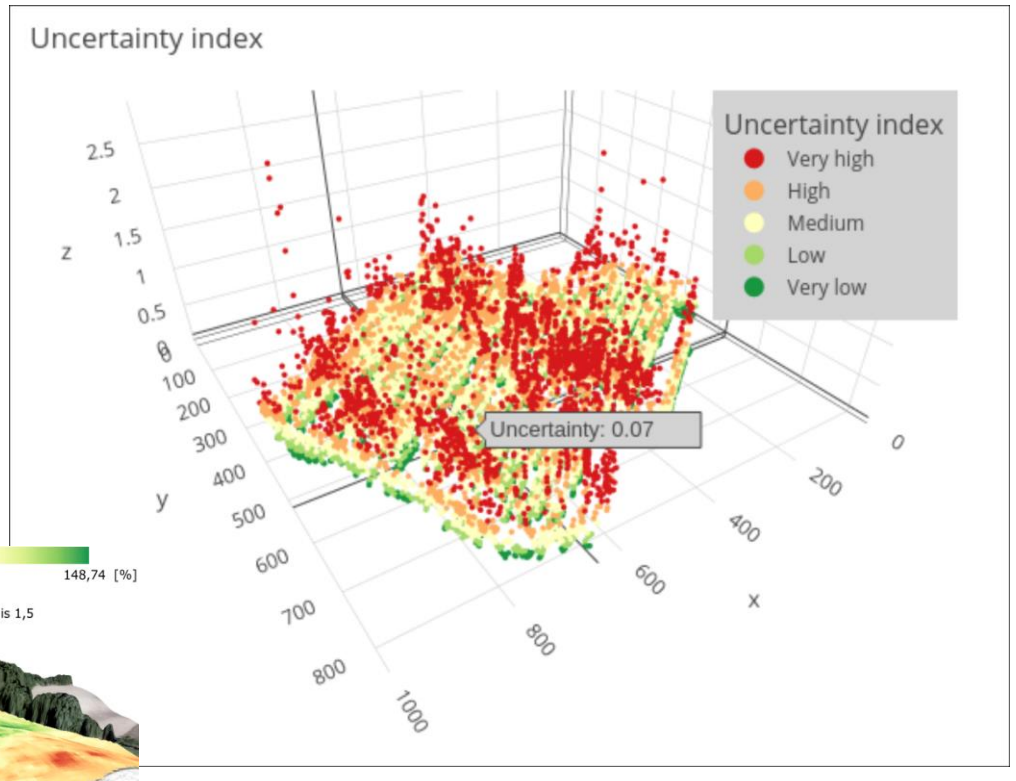




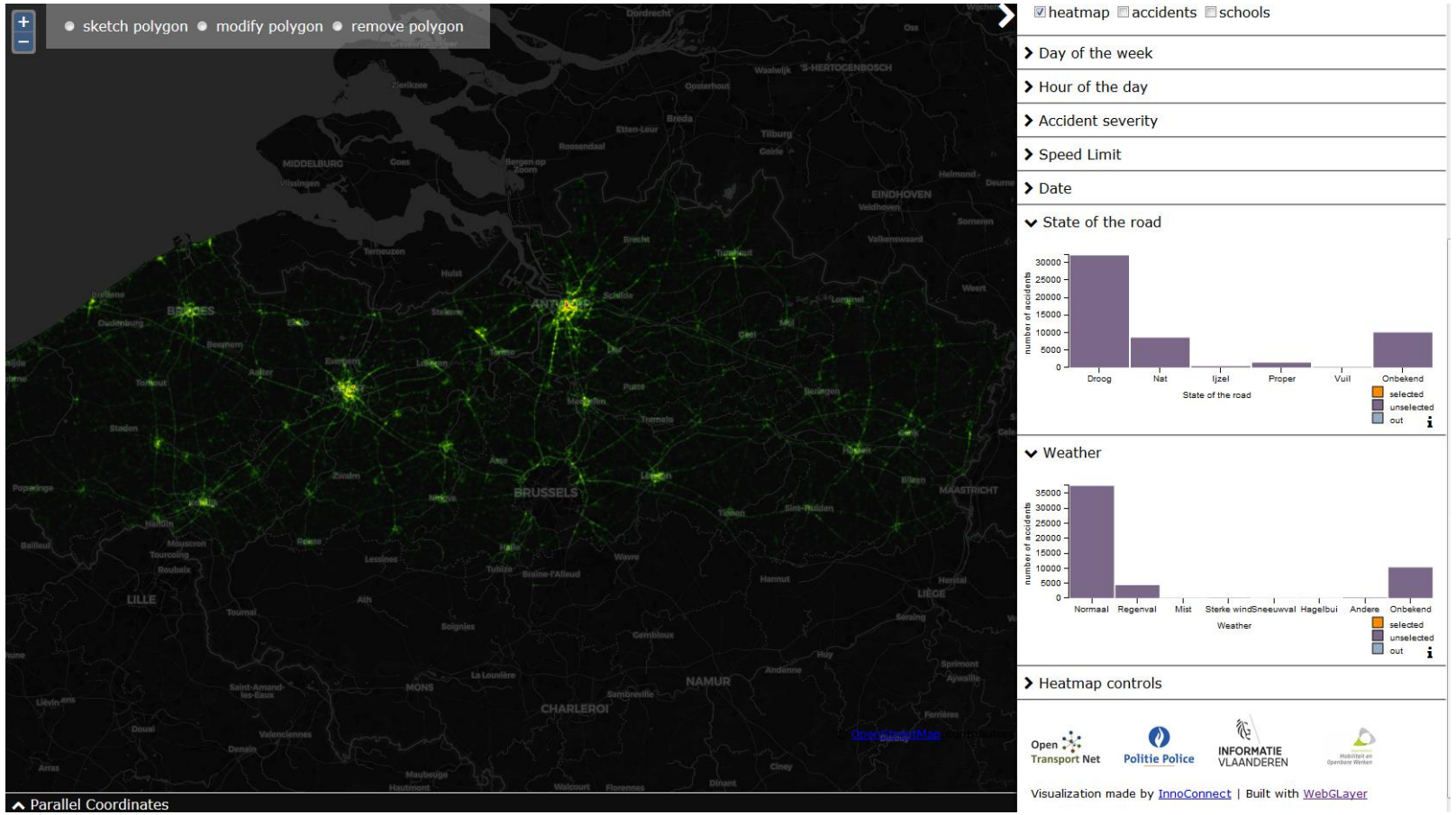
…also in 3D


Relative yield values and terrain
Relative yield
200 %
150 %
100 %
50 %
Elevation: 234.41 m
Yield: 108.46 %
z
y
x


52,29
148,74 [%]
Z scale is 1,5


Uncertainty index
Uncertainty index
Very high
High
Medium
Low
Very low
Uncertainty: 0.07
z
y
x

Visualizations of Sensor Data – Traffic Accidents in Flanders



Metadata Viewpoints

the most boring

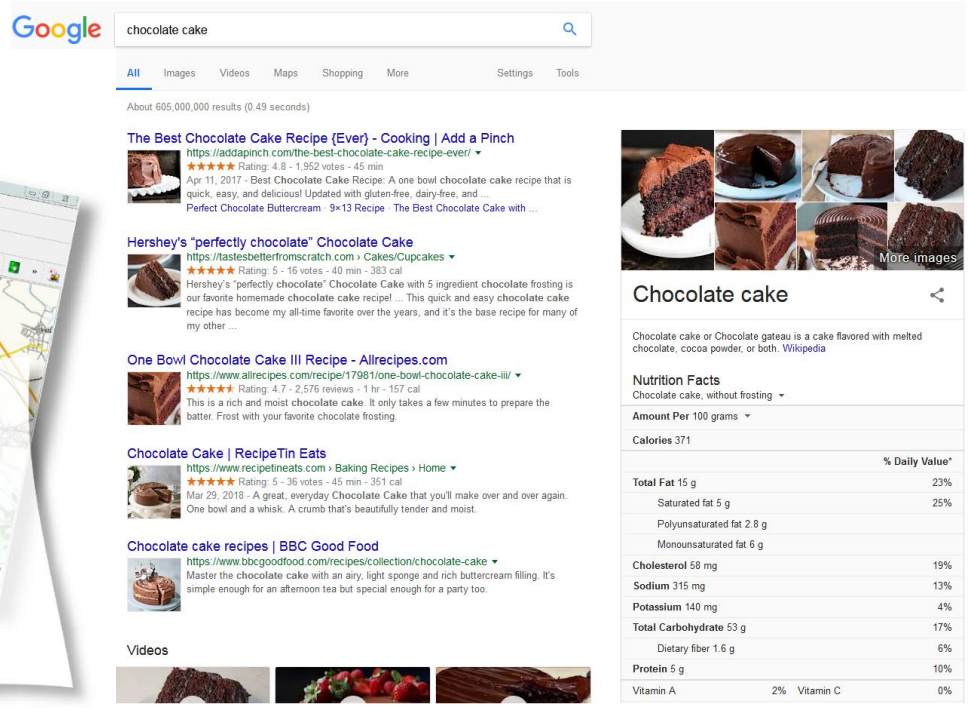
necessary evil

complicated

too much text

not answering my question(s)

mandatory

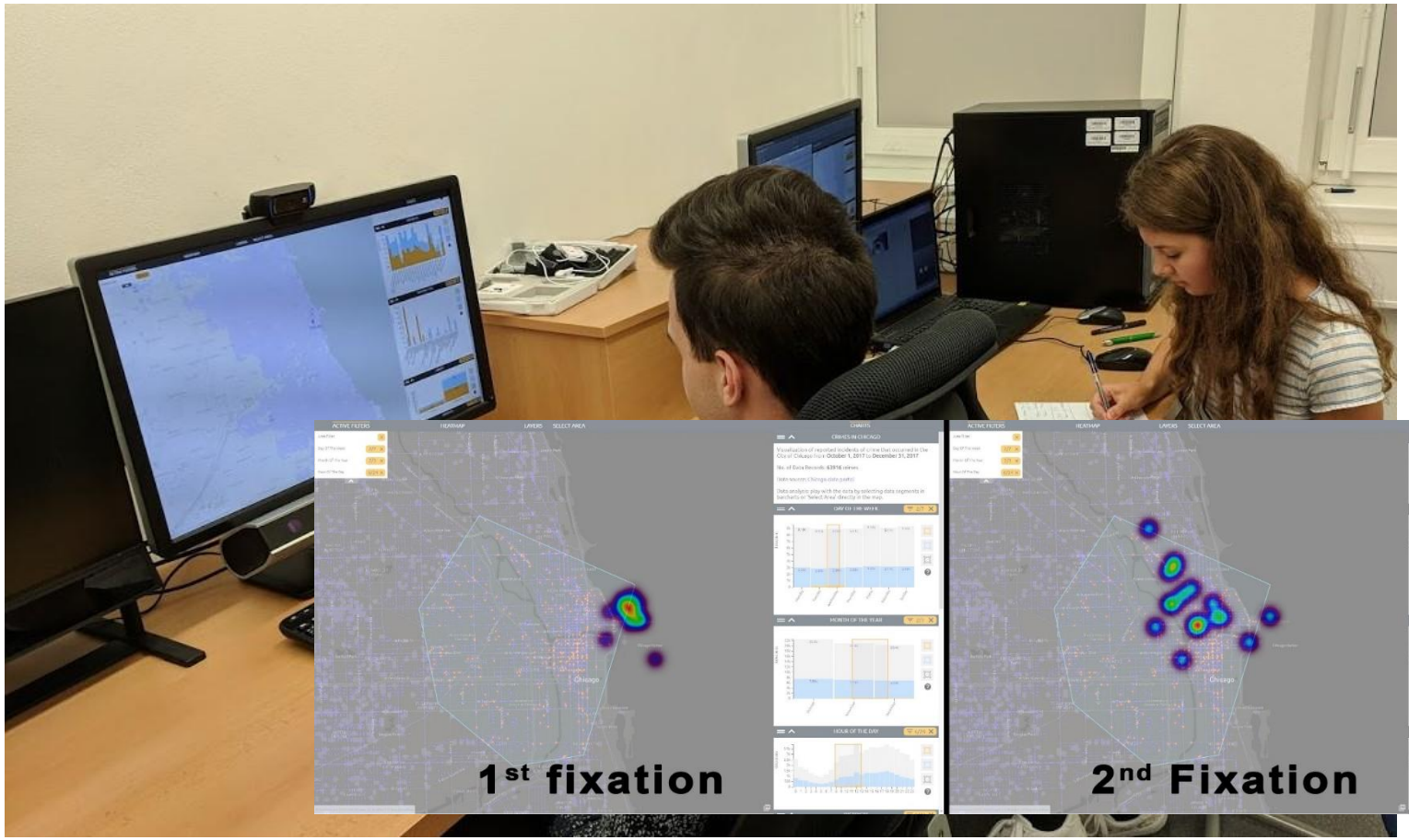


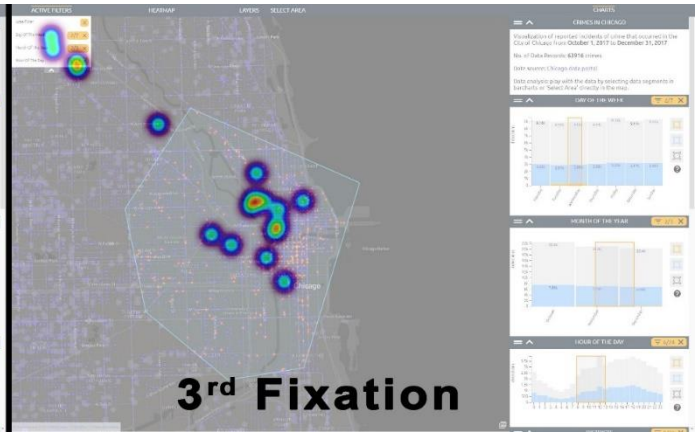
119,000 metadata records
harvested by Google from our catalogue at once in August 2018
(and regularly updated untill now)

Crisis Management – Playing with Drones (RPAS)

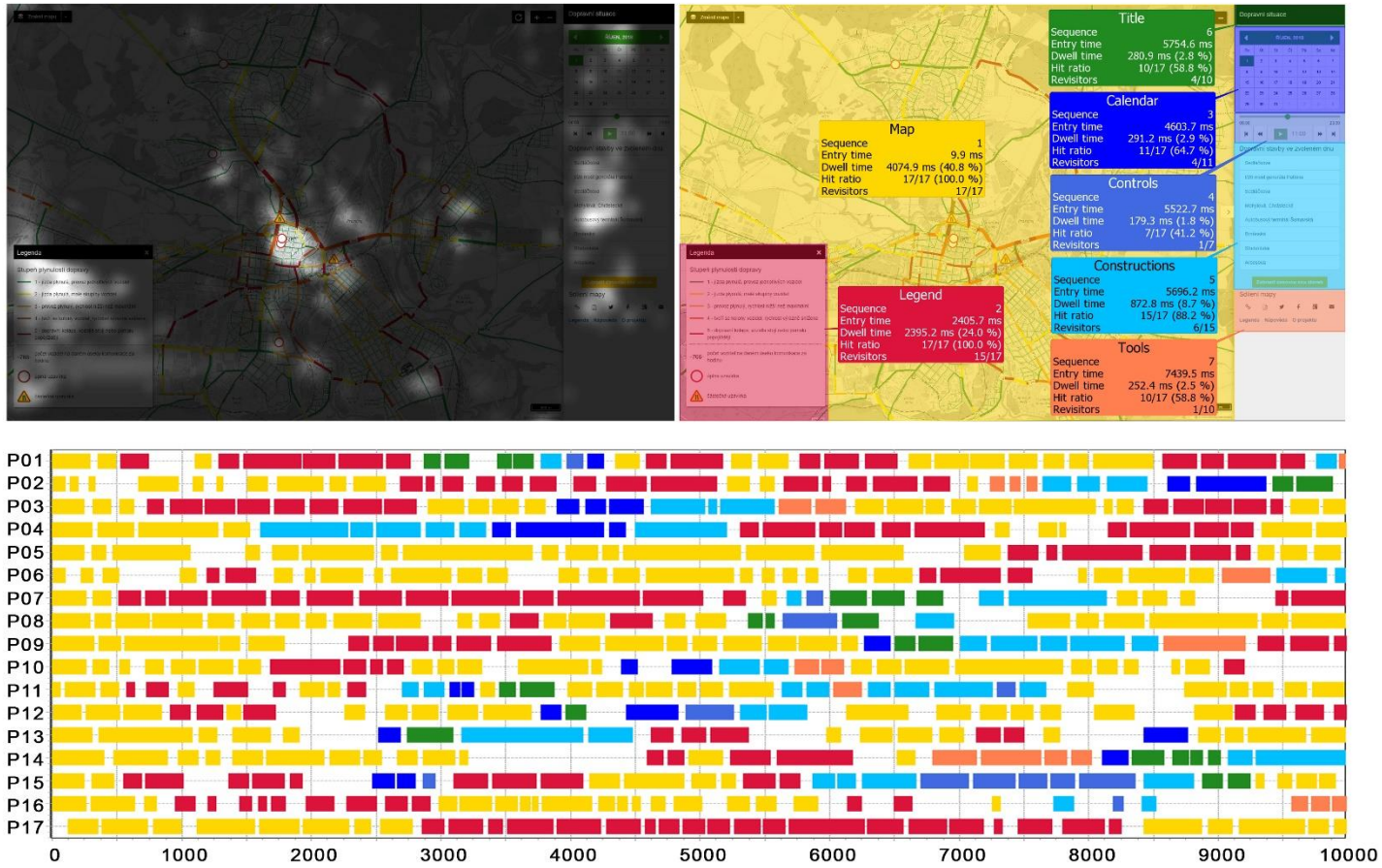
- Army drones
- since 2009

Cognitive Cartography and Eye tracking





Analyses of Recorded Eye-Tracking Data



Read more

- Reznik, T.; Pavelka, T.; Herman, L.; Lukas, V.; Sirucek, P.; Leitgeb, S.; Leitner, F. Prediction of Yield Productivity Zones from Landsat 8 and Sentinel-2A/B and Their Evaluation Using Farm Machinery Measurements. *Remote Sensing* **2020**, *12*, 1–17. https://doi.org/10.3390/rs12121917
- Reznik, T.; Kubicek, P.; Herman, L.; Pavelka, T.; Leitgeb, S.; Klocova, M.; Leitner, F. Visualizations of Uncertainties in Precision Agriculture: Lessons Learned from Farm Machinery. *Applied Sciences* **2020** [in press], 1-21
- Reznik, T.; Pavelka, T.; Herman, L.; Leitgeb, S.; Lukas, V.; Sirucek, P. Deployment and Verifications of the Spatial Filtering of Data Measured by Field Harvesters and Methods of Their Interpolation: Czech Cereal Fields between 2014 and 2018. *Sensors* **2019**, *19*, 1–25. http://doi.org/10.3390/s19224879
- Popelka, S., Herman, L., Reznik, T., Parilova, M., Jedlicka, K., Bouchal, J., Kepka, M., Charvat, K. User Evaluation of Visual Analytic Applications for (Big) Geospatial Data. ISPRS International Journal of Geo-Information **2019**, 8 (8), 1–22. https://doi.org/10.3390/ijgi8080363

May the GEO be with you!

T☺m

Image adopted from: http://clipground.com