

Stanislav Popelka, Jan Senkerik, Tomas Vanicek, **Marketa Beitlova**

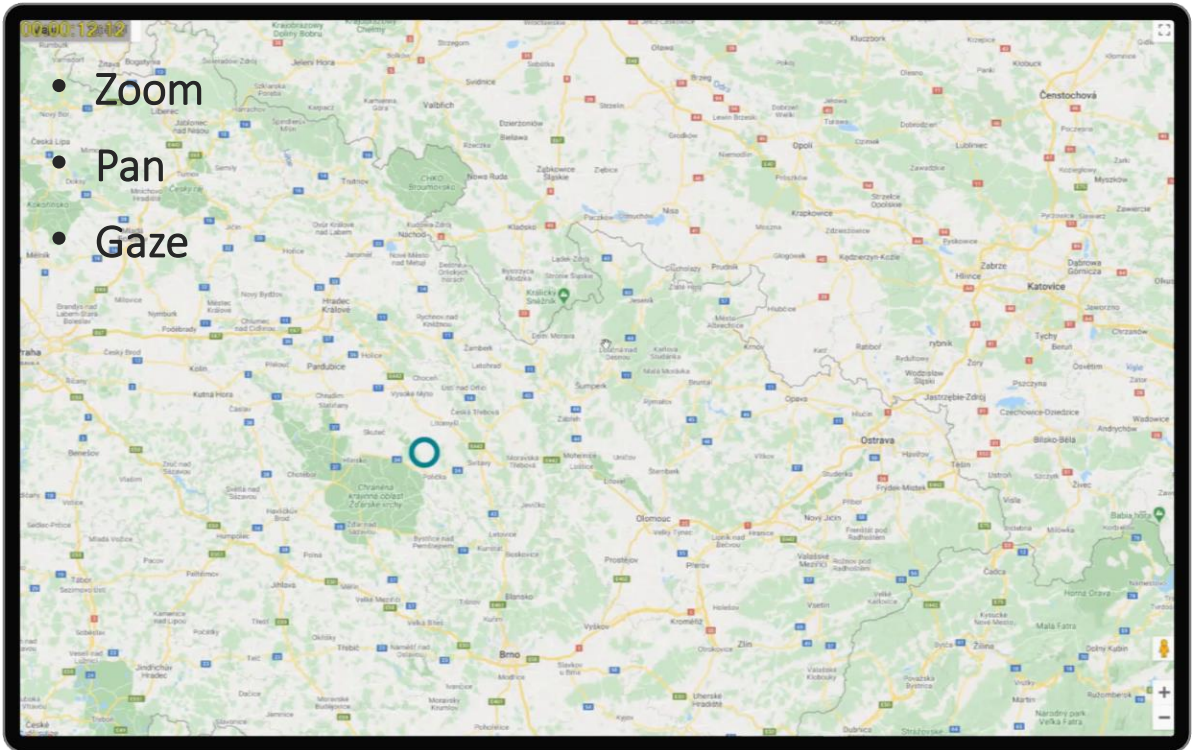
Visualizing Eye Movement Data of Web Maps

The ET2Spatial & ET2GIS & ET2QGIS Tools

Data gathering

Identifying the issue

- Zoom
- Pan
- Gaze

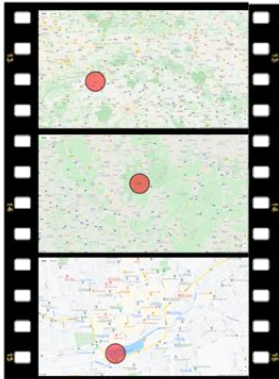


Data processing

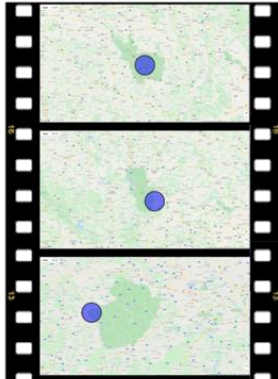
Traditional Approach

Separate videos for each participant

P01

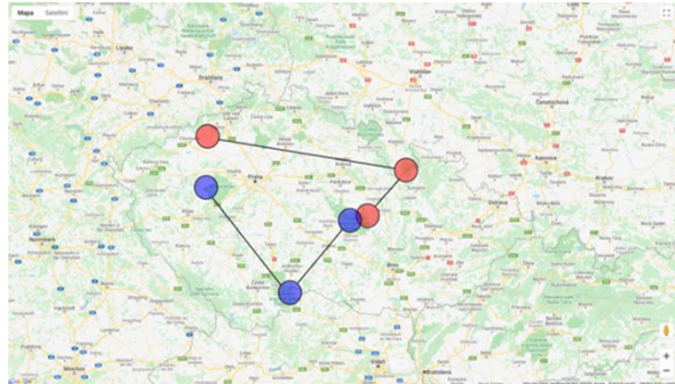


P02



Output of ET2Spatial Tool

Georeferenced data in GIS

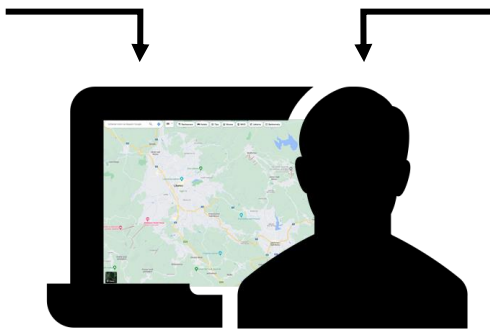


Eye-tracking data

- SMI eye-tracker
- TOBII (tobii2spatial)

User Interaction data

- Google Maps API v2
- MapTrack (Ruzicka, 2012)



ET2Spatial

- analyzing ET data of interactive web maps
- conversion from screen to map coordinates



ET2GIS



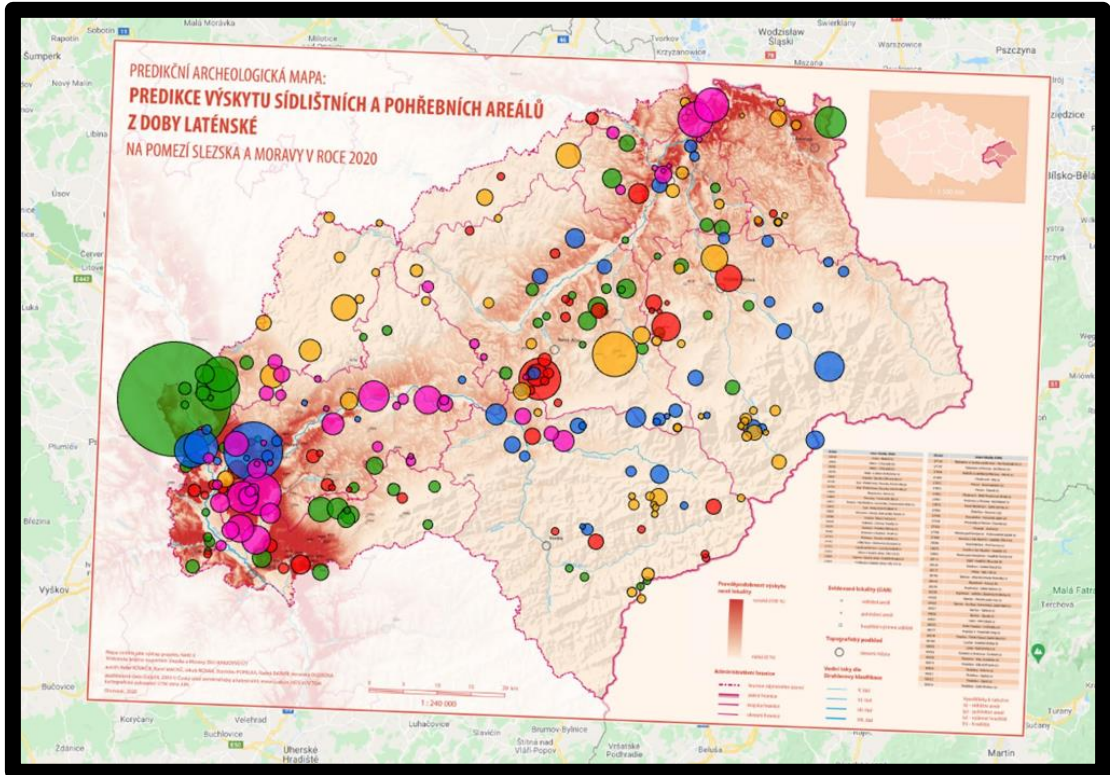
GIS Software



ET2QGIS

Overlay possibilities

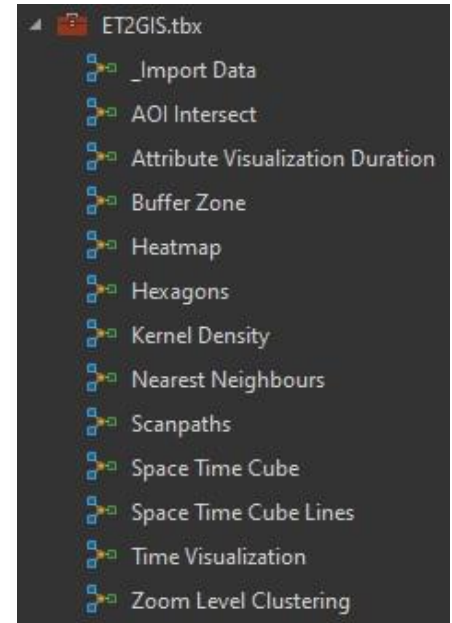
- can be overlaid on any of your maps



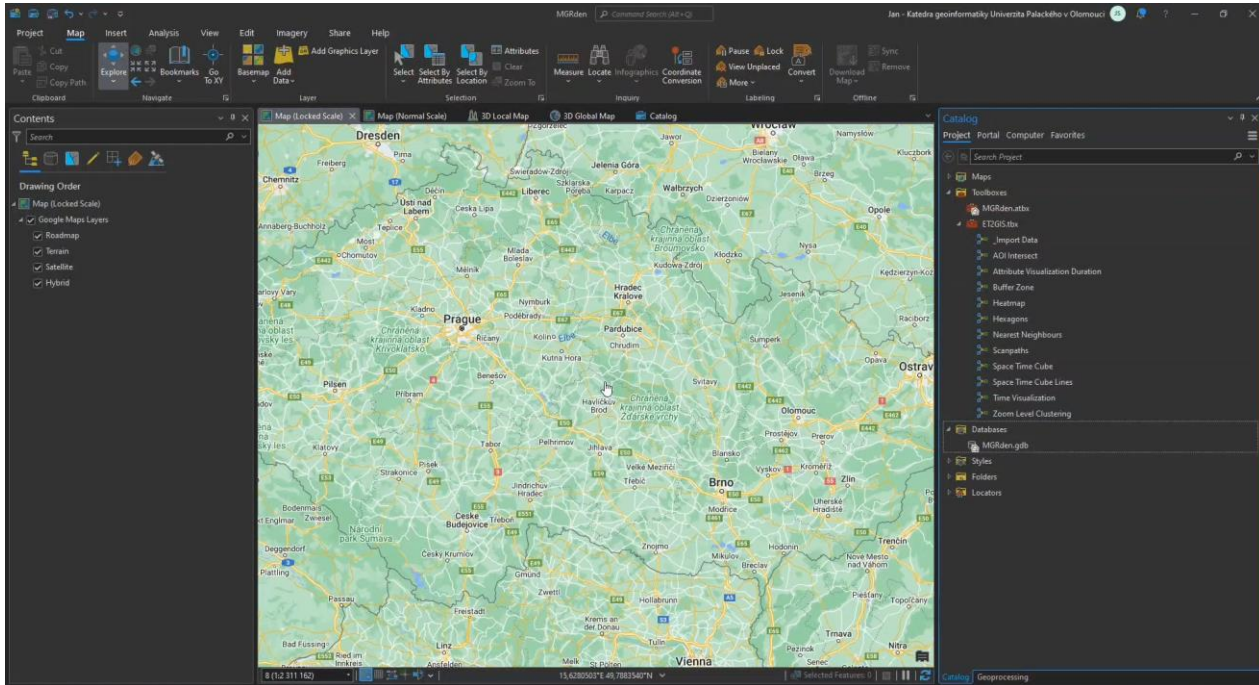
ET2GIS Toolbox



- read data from ET2Spatial
- easy data import
- standard ET data visualizations known from other software
 - Heatmap, Scanpaths, etc.
- unusual ET data visualizations
 - Zoom Level Clustering, Space Time Cube, etc.
- English manual with a description of each tool with pictures



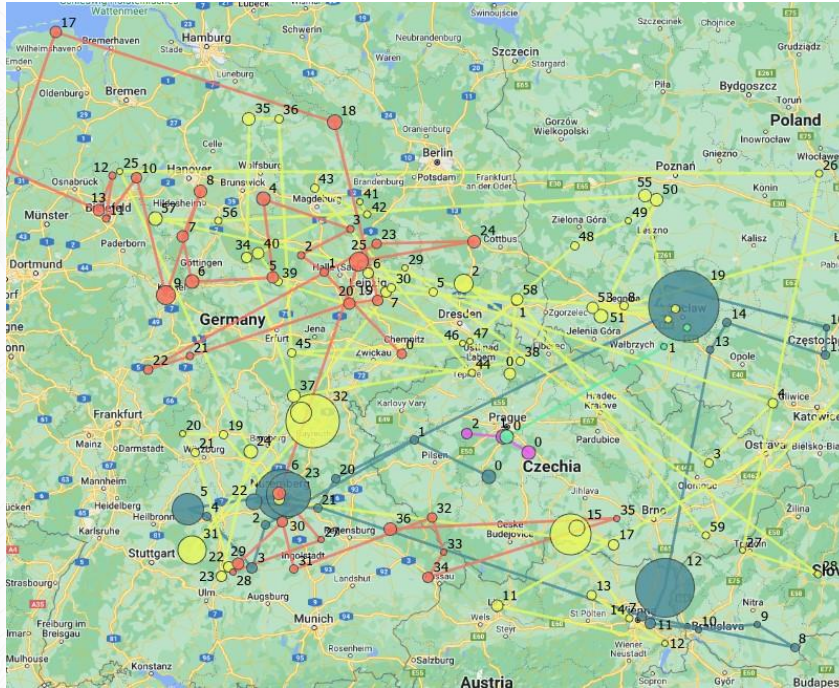
Import data



Tool environment

Scanpaths

Tool environment

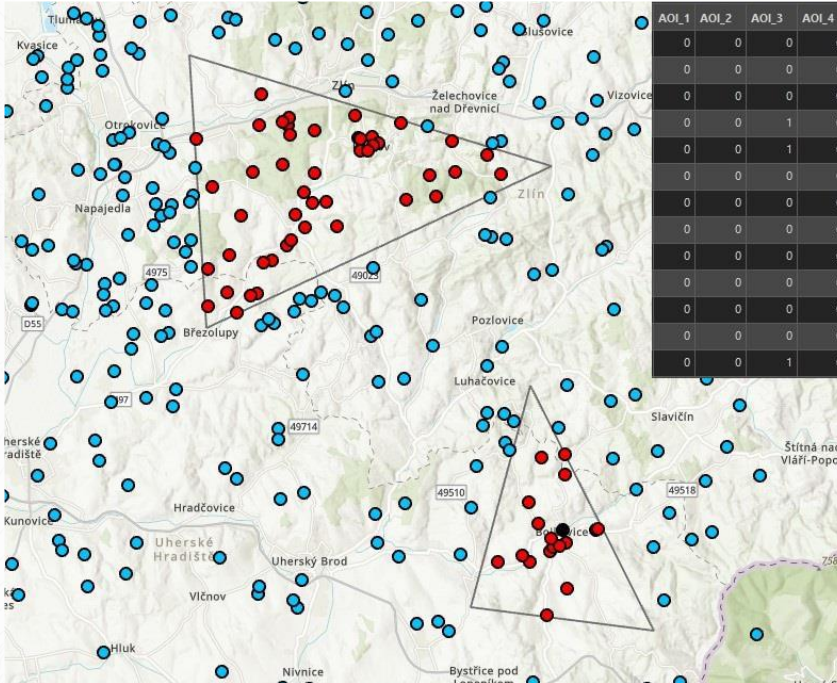


ET2GIS.tbx

- _Import Data
- AOI Intersect
- Attribute Visualization Duration
- Buffer Zone
- Heatmap
- Hexagons
- Kernel Density
- Nearest Neighbours
- Scanpaths**
- Space Time Cube
- Space Time Cube Lines
- Time Visualization
- Zoom Level Clustering

Area of Interest Intersect

Tool environment

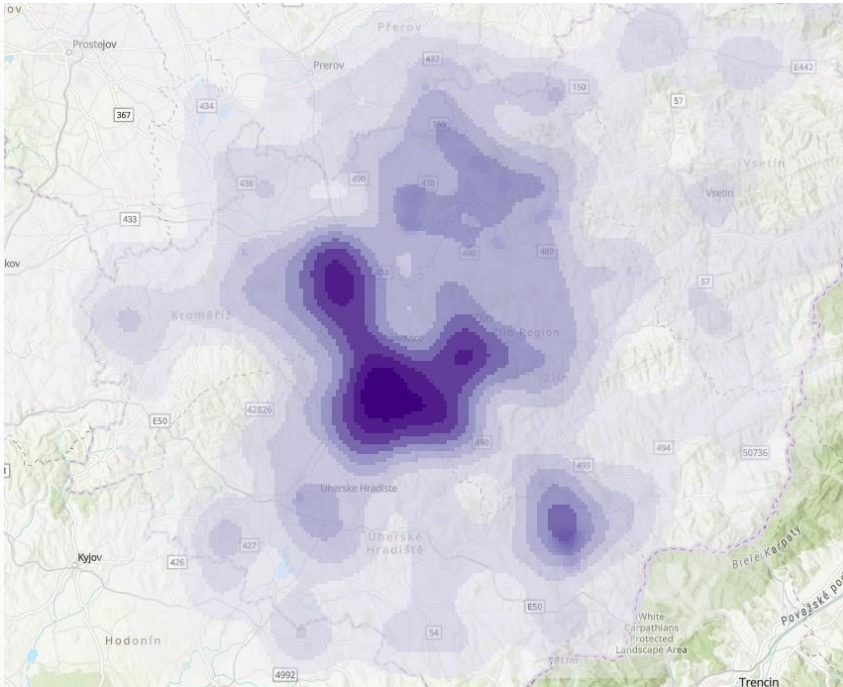


ET2GIS.tbx

- _Import Data
- AOI Intersect**
- Attribute Visualization Duration
- Buffer Zone
- Heatmap
- Hexagons
- Kernel Density
- Nearest Neighbours
- Scanpaths
- Space Time Cube
- Space Time Cube Lines
- Time Visualization
- Zoom Level Clustering

Kernel Density

Tool environment

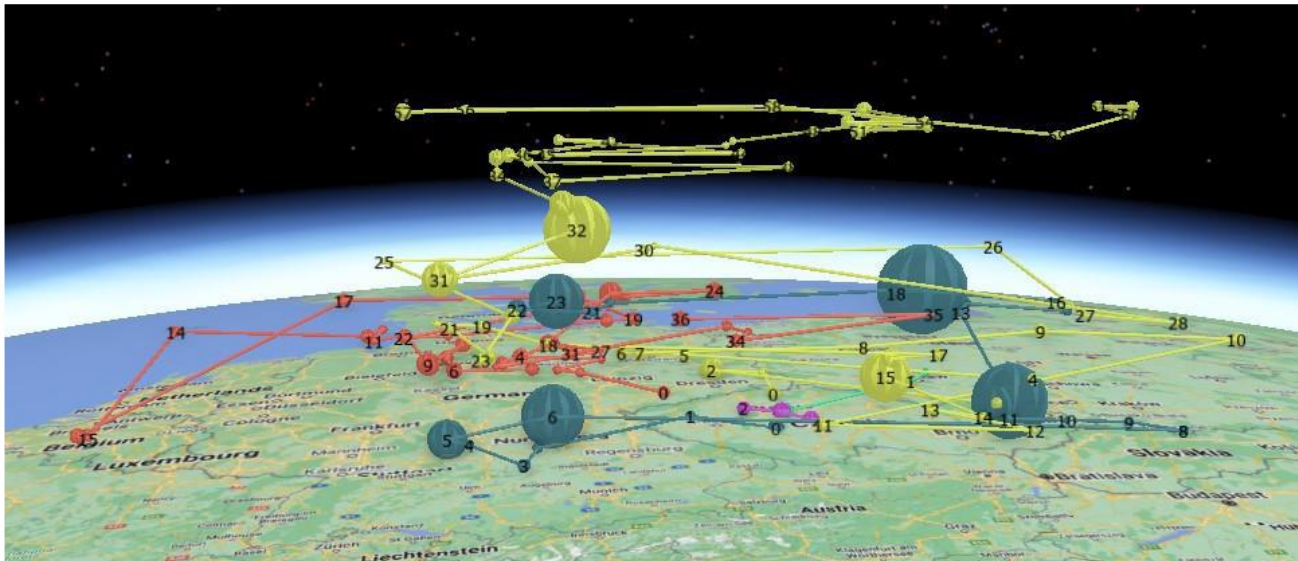


ET2GIS.tbx

- _Import Data
- AOI Intersect
- Attribute Visualization Duration
- Buffer Zone
- Heatmap
- Hexagons
- Kernel Density**
- Nearest Neighbours
- Scanpaths
- Space Time Cube
- Space Time Cube Lines
- Time Visualization
- Zoom Level Clustering

Space Time Cube & Lines

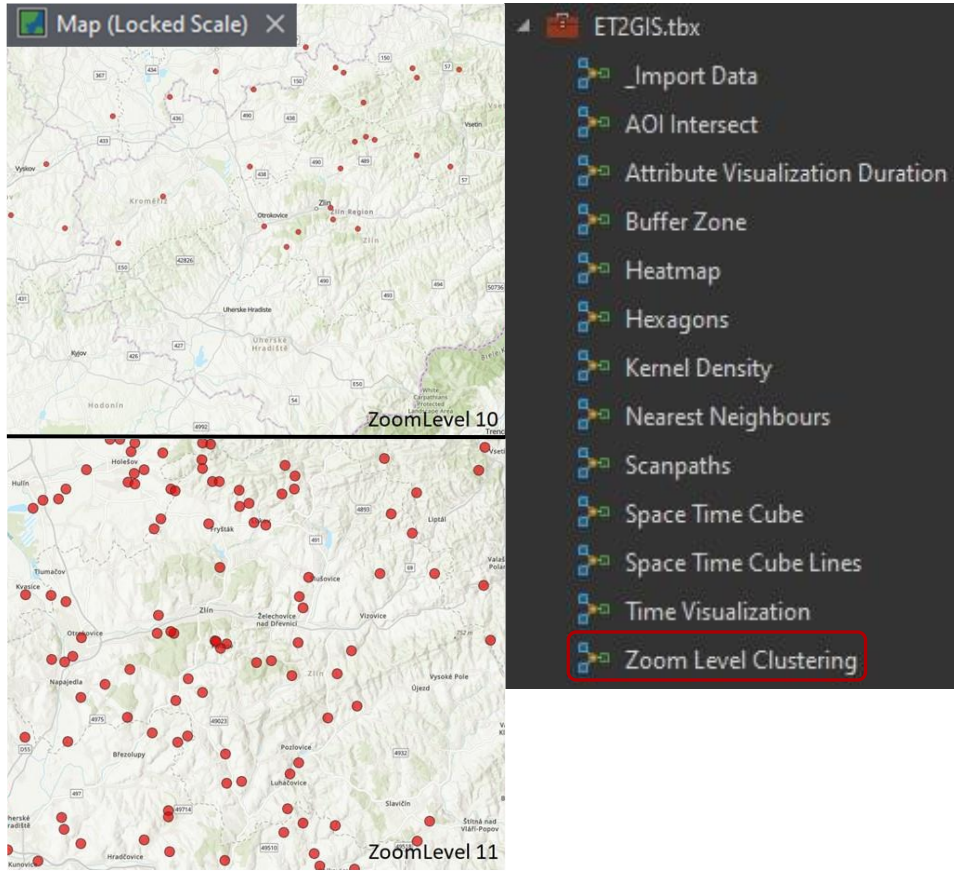
Tool environment



- ET2GIS.tbx
- _Import Data
- AOI Intersect
- Attribute Visualization Duration
- Buffer Zone
- Heatmap
- Hexagons
- Kernel Density
- Nearest Neighbours
- Scanpaths
- Space Time Cube**
- Space Time Cube Lines
- Time Visualization
- Zoom Level Clustering

Zoom Level Clustering

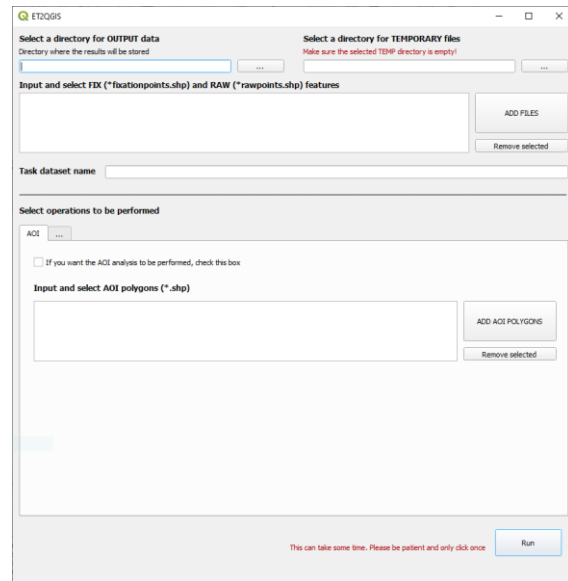
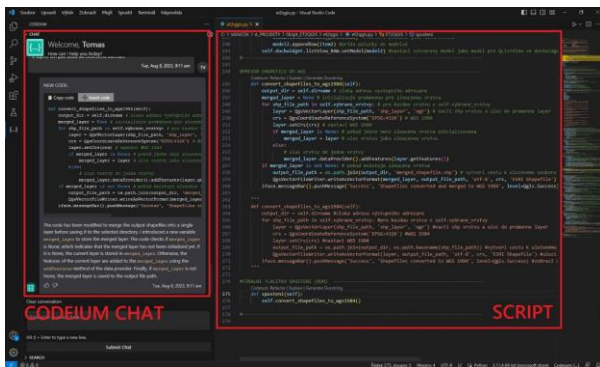
Tool environment



ET2QGIS



- plugin to QGIS
- same functionality
- similar solution
- benefit - all in one window



In progress

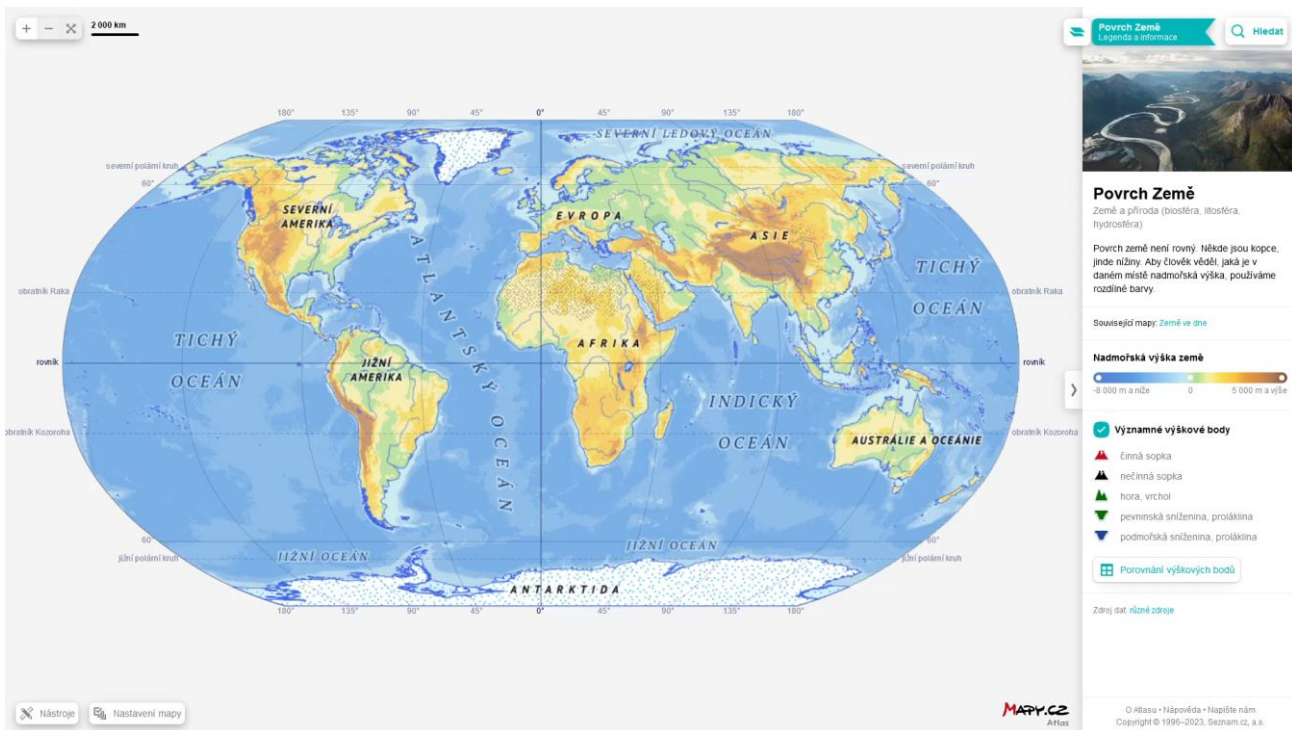
Where we are...

Tool for analyzing dynamic eye-tracking and user interaction data (zoom, pan, gaze)

- available for everyone
- for SMI & Tobii eye-tracker devices
- based on Google Maps API v2
- data analysis in ArcGIS Pro and QGIS

...and where we intend to be

- video demonstration of other options for interaction with the web map (<https://atlas.mapy.cz>)



Work in progress

...and where we intend to be

- Develop an object-oriented analysis of eye-tracking data that reflects the nature of the map,
- by combining eye movements with the user behaviour, the way environment is interact can be revealed.
- Connecting all those human interactions like gaze, mouse clicking, loud expressions.



You can find all our tools at
eyetracking.upol.cz/tools

Thank you for attention

marketa.beitlova@gmail.com

This presentation was supported by project "Identification of barriers in the process of communication of spatial socio-demographic information,, [23-06187S] of the Czech Science Foundation.