The Art of Thematic Interpretation: Seminar Program (5 days)

Day 1
Theoretical part:
- Satellite imagery and its features,
- Satellite imagery classification by key properties;
- The current database of satellite images;
- Satellite imagery processing levels;
- Satellite imagery pre-processing methods: radiometric correction, geometric normalization;
- Methods and tools of satellite imagery further processing: improvement of spatial resolution, synthesis of additional channels, enhancements and atmospheric correction;
- The products of satellite imagery processing;
- Application areas and possible use of satellite imagery;
- Preliminary image analysis required for data decryption;
- Key methods and approaches to satellite imagery decryption: visually interactive and automatic decryption;
- Algorithms of automated satellite imagery classification: per-pixel and object-oriented classification;
- Additional methods and tools of decryption;
- General technology chain of satellite imagery thematic processing.

Day 2 **Test assignments on the theoretical part**
Practical part:
- Getting familiar with the software interface;
- Operations with the histogram tool;
- Operations with the raster sampling (statistical analysis) tool;
- Satellite image classification by the method of spectral non-learning per-pixel classification;
- Creation of learning classification standards;
- Satellite image classification based on feedforward neural networks;
- Satellite image classification based on the method of pre-trained self-organizing neural networks;
- Managing the display and representation of the neural network, preliminary assessment of a created neural network and classification quality;
- Creating a thematic legend and the system of hierarchical classes;
- Vectorization and rasterization of classification results, saving classification results.

Day 3
Test assignments on the practical part
Practical part:
- Fine-tuning and setup of a neural network, operating neural networks with different settings;
- Assessment of results generated by neural networks with different settings;
- Thematic calibration of a neural network, creating standards for the thematic calibration of a neural network;
- Post-processing of neural classification results through local image texture analysis;
- Assessment of calibration and post-processing results;
- Segmentation of a multi-channel satellite image;
- Post-processing of satellite imagery classification results;
- Local transcoding of satellite imagery classification results.

Day 4
Test assignments on the practical part
Practical part:
- Image classification based on direct channel analysis with the use of legend tools;
- Binary classification;
- Detection of variations in multi-temporal data though the use of Single Channel Change Detection tool;
- Detection of variations in multi-temporal data though the use of Multi-Single Channel Change Detection tool;
- Detection of variations in multi-temporal data though the use of a multi-temporal composite;
- Additional methods of per-pixel imagery classification offered by the software.

Day 5

Test assignments on the practical part
Practical part:
- Thematic image analysis based on the computation of indexed properties;
- Satellite image classification based on the multi-temporal raster composite of indexed properties;
- Analysis of a digital elevation model (DEM).

Summing up training results:
- Individual assignments;
- Students' questions and answers;
- The award of certificates to acknowledge the successful completion of the "Art of Thematic Interpretation" training course.