

## Laboratory of Geographic Information Systems

### Geographic Registration of Aerial Images using Quantum GIS

#### TASKS:

1. Prepare a geographically registered aerial photograph using Quantum GIS (up to)5 pt.

#### INSTRUCTIONS:

Before starting your work, navigate to *D:/Materials/GIS/Aerial Images/* and choose an image for spatial registration. Remember that in order to properly register the image, you will need to find at least six unique and easily recognizable locations spread uniformly across the image. It is recommended to use man-made structures such as building corners. **However, do not use building roofs, as they may be displaced on the aerial images due to the angle at which the image was captured.**

After starting Quantum GIS Desktop, it is necessary to enable appropriate plugins. For this reason go to **Plugins -> Manage and Install Plugins**. From the **Installed** list choose **Open Layers Plugin** and enable the plugin. Next select **Georeferencer GDAL** and enable it as well. **In new versions of QGIS, the georeferencer plugin is not available because the mechanism is built-in and can be accessed through Raster->Georeferencer.**

You are now ready to start the exercise. First, load the background map by selecting **Web -> OpenLayers plugin -> Add Bing Aerial layer**. Next, from the **Raster** menu select **Georeferencer -> Georeferencer**. This will start the georeferencing module. In the Georeferencer window choose **File->Open raster** and load your chosen aerial photograph. Once you have identified suitable control points, find and click one of them on the aerial image. Next, in the popup window choose **From map canvas**. This will take you to the main QGIS window, where you'll need to find and click the exact same location on the Bing map. Remember that the accuracy of your selection will impact the georeferencing results (and, in consequence, your final mark!).

Once you have selected at least five points, you can attempt to use them for the purpose of georeferencing the aerial image. To do this, go to **Settings -> Transformation settings** in the Georeferencer window. In the **Transformation settings** menu, choose **Polynomial 2** as **Transformation type**, **Cubic** as the **Resampling method**, and set the **Output raster directory** to your folder in *D:/student/*. Finally, click **Start georeferencing**.

You can observe the results by adding the produced image to your map. In the main QGIS window click **Layer -> AddRaster Layer** and choose **EPSG:3857** as the Coordinate Reference System. To inspect the quality of your georeferencing operation, apply a 45-50% transparency to the aerial image and overlay it on the Bing Maps layer. Ideally, features on your georeferenced image (roads, buildings, rivers etc.) should align perfectly with their counterparts on the underlying Bing Maps layer.