Dense DSM Generation Module in PHOTOMOD 6.0

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The first dense DTM algorithm was introduced in PHOTOMOD some time ago. It used CUDA technology for speedup and was based on the cross-correlation algorithm. It is well known, that cross-correlation local algorithms produce smoothed buildings and do not give good results in occlusion areas. The calculated DTM needs to be filtered to remove trees and buildings. This DTM is good for orthophoto production and level lines calculations.

The new version of PHOTOMOD 6.0 comes with the new module for dense DSM, the new module requires a special license. The algorithm of this module is based on the idea, that orthophotos calculated from different images must be the same if the correct DSM is used for orthophoto generation. We call this algorithm iterative deformation method (IDM). The resulting DSM accuracy and quality strongly depends on the number of overlaps of images having the same point. It is advisable to have at least quadruple images overlap. When deforming the surface we use special functions to fit building walls and high constructions. Some elements of image recognition theory are also used.

Here is an example of 3D surface for the aerial project of Munich town.

We used orthophoto as a texture – this lead to the building walls not colored correctly. The new DSM module works with aerial and pushbroom images and will be available with PHOTOMOD 6.0 release.