Volume XXXIX-B3

ULTRAMAP: THE ALL IN ONE PHOTOGRAMMETRIC SOLUTION

A. Wiechert, M. Gruber, and K. Karner
Vexcel Imaging Austria, Microsoft Photogrammetry, Anzengrubergasse 8/4, 8010 Graz, Austria

Keywords: Photogrammetry, Digital, Camera, Large Format, Mapping, Dense Matching

Abstract. This paper describes in detail the dense matcher developed since years by Vexcel Imaging in Graz for Microsoft's Bing Maps project. This dense matcher was exclusively developed for and used by Microsoft for the production of the 3D city models of Virtual Earth. It will now be made available to the public with the UltraMap software release mid-2012. That represents a revolutionary step in digital photogrammetry. The dense matcher generates digital surface models (DSM) and digital terrain models (DTM) automatically out of a set of overlapping UltraCam images. The models have an outstanding point density of several hundred points per square meter and sub-pixel accuracy and are generated automatically. The dense matcher consists of two steps. The first step rectifies overlapping image areas to speed up the dense image matching process. This rectification step ensures a very efficient processing and detects occluded areas by applying a back-matching step. In this dense image matching process a cost function consisting of a matching score as well as a smoothness term is minimized. In the second step the resulting range image patches are fused into a DSM by optimizing a global cost function. The whole process is optimized for multi-core CPUs and optionally uses GPUs if available. UltraMap 3.0 features also an additional step which is presented in this paper, a complete automated true-ortho and ortho workflow. For this, the UltraCam images are combined with the DSM or DTM in an automated rectification step and that results in high quality true-ortho or ortho images as a result of a highly automated workflow. The paper presents the new workflow and first results.

Conference Paper (PDF, 757 KB)

Citation: Wiechert, A., Gruber, M., and Karner, K.: ULTRAMAP: THE ALL IN ONE PHOTOGRAMMETRIC SOLUTION, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B3, 183-186, doi:10.5194/isprsarchives-XXXIX-B3-183-2012, 2012.

Bibtex   EndNote   Reference Manager   XML