Volume XXXIX-B7

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B7, 79-84, 2012
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XXXIX-B7/79/2012/
doi:10.5194/isprsarchives-XXXIX-B7-79-2012

MATCHING PERSISTENT SCATTERERS TO BUILDINGS

A. Schunert, L. Schack, and U. Soergel
Leibniz Universität Hannover, Institute of Photogrammetry and GeoInformation, Nienburger Strasse 1, 30167 Hannover, Germany

Keywords: SAR, Interferometer, Monitoring, Matching, Urban

Abstract. Persistent Scatterer Interferometry (PSI) is by now a mature technique for the estimation of surface deformation in urban areas. In contrast to the classical interferometry a stack of interferograms is used to minimize the influence of atmospheric disturbances and to select a set of temporarily stable radar targets, the so called Persistent Scatterers (PS). As a result the deformation time series and the height for all identified PS are obtained with high accuracy. The achievable PS density depends thereby on the characteristics of the scene at hand and on the spatial resolution of the used SAR data. This means especially that the location of PS cannot be chosen by the operator and consequently deformation processes of interest may be spatially undersampled and not retrievable from the data. In case of the newly available high resolution SAR data, offering a ground resolution around one metre, the sampling is potentially dense enough to enable a monitoring of single buildings. However, the number of PS to be found on a single building highly depends on its orientation to the viewing direction of the sensor, its facade and roof structure, and also the surrounding buildings. It is thus of major importance to assess the PS density for the buildings in a scene for real world monitoring scenarios. Besides that it is interesting from a scientific point of view to investigate the factors influencing the PS density. In this work, we fuse building outlines (i.e. 2D GIS data) with a geocoded PS point cloud, which consists mainly in estimating and removing a shift between both datasets. After alignment of both datasets, the PS are assigned to buildings, which is in turn used to determine the PS density per building. The resulting map is a helpful tool to investigate the factors influencing PS density at buildings.

Conference Paper (PDF, 1611 KB)

Citation: Schunert, A., Schack, L., and Soergel, U.: MATCHING PERSISTENT SCATTERERS TO BUILDINGS, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B7, 79-84, doi:10.5194/isprsarchives-XXXIX-B7-79-2012, 2012.

Bibtex EndNote Reference Manager XML