FUSION OF DIGITAL ELEVATION MODELS USING SPARSE REPRESENTATIONS

H. Papasaika[1], E. Kokiopoulou[2], E. Baltsavias[1], K. Schindler[1], D. Kressner[3]

[1] Institute of Geodesy and Photogrammetry, ETH Zurich, Switzerland
[2] Seminar for Applied Mathematics, ETH Zurich, Switzerland
[3] Mathematics Institute of Computational Science and Engineering, EPFL, Switzerland

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ABSTRACT:

Nowadays, different sensors and processing techniques provide Digital Elevation Models (DEMs) for the same site, which differ significantly with regard to their geometric characteristics and accuracy. Each DEM contains intrinsic errors due to the primary data acquisition technology, the processing chain, and the characteristics of the terrain. DEM fusion aims at overcoming the limitations of different DEMs by merging them in an intelligent way. In this paper we present a generic algorithmic approach for fusing two arbitrary DEMs, using the framework of sparse representations. We conduct extensive experiments with real DEMs from different earth observation satellites to validate the proposed approach. Our evaluation shows that, together with adequately chosen fusion weights, the proposed algorithm yields consistently better DEMs.

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