

Digital elevation model generation for historical landscape analysis based on LiDAR data, a case study in Flanders (Belgium)

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This paper discusses the generation of a high precision DEM (Digital Elevation Model) based on high density airborne LiDAR (Light Detection and Ranging) data for an interdisciplinary landscape archaeological study concerning the settlement history and environment in Sandy Flanders north of Ghent (Belgium) (cf. De Reu J. et al. regarding the general setup of the project and Zwertvaegher A. et al. concerning geomorphological and hydrological research). The objective was to create a detailed topographical surface free of artificial features and topographical artefacts, in the form of a DEM visualizing the natural and present-day topography by the implementation of true ground points only. The semi-automatically removal of these features and artefacts was based on topographical vector data, visual interpretations and slope analysis. Ultimately two DEM's are constructed (1) a TIN (Triangulated Irregular Network) model whereby the inherent large file format restricts the usability to large scale and (2) a grid model which can be used for small-, medium- and large-scale applications. Both datasets are used as an image that is interpreted using ancillary data from historical sources. Its usefulness is illustrated in a case of field pattern and micro-field topography. Starting from this DEM, the approach of this landscape historical study is mainly retrogressive, i.e. starting from the landscape structures and elements that are still present in the contemporary landscape and moving into the past.

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