Abstract:

Building datasets (e.g., footprints in OpenStreetMap and 3D city models) are becoming increasingly available worldwide. However, the thematic (attribute) aspect is not always given attention, as many of such datasets are lacking in completeness of attributes. A prominent attribute of buildings is the year of construction, which is useful for some applications, but its availability may be scarce. This paper explores the potential of estimating the year of construction (or age) of buildings from other attributes using random forest regression. The developed method has a two-fold benefit: enriching datasets and quality control (verification of existing attributes). Experiments are carried out on a semantically rich LOD1 dataset of Rotterdam in the Netherlands using 9 attributes. The results are mixed: the accuracy in the estimation of building age depends on the available information used in the regression model. In the best scenario we have achieved predictions with an RMSE of 11 years, but in more realistic situations with limited knowledge about buildings the error is much larger (RMSE $= 26$ years). Hence the main conclusion of the paper is that inferring building age with 3D city models is possible to a certain extent because it reveals the
approximate period of construction, but precise estimations remain a difficult task.

**Stichworte:**
3D city models; building age; year of construction; CityGML; machine learning; random forest regression; GISPro(SSD); GISTop_CityModeling; GISTop_SpatialModelingAndAlgorithms; LOCenter; LOCTop_Urban_Information_Modeling_Virtual_3D_City_Model

**Herausgeber:**
Kalantari, Mohsen; Rajabifard, Abbas

**Kongress- / Buchtitel:**
Proceedings of the 12th International 3D GeoInfo Conference 2017

**Band / Teilband:**
IV-4/W5

**Ausrichter der Konferenz:**
University of Melbourne

**Verlag / Institution:**
ISPRS

**Publikationsdatum:**
26.10.2017

**Jahr:**
2017

**Nachgewiesen in:**
Scopus; Web of Science

**Serientitel:**
ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences

**Revied:**
ja

**Sprache:**
en

**Volltext / DOI:**
http://doi.org/10.5194/isprs-annals-IV-4-W5-17-2017

**WWW:**
https://www.isprs-ann-photogramm-remote-sens-spatial-inf-sci.net/IV-4-W5/17/2017/

**Hinweise:**
This paper received the Best Paper Award.

**TUM Einrichtung:**
Lehrstuhl für Geoinformatik

**Occurences:**
- Hochschulbibliographie > 2017 > Fakultäten > IngenieurBau Geo Umwelt > Lehrstuhl für Geoinformatik (Prof. Kolbe)
- Einrichtungen > Fakultäten > Ingenieurfakultät Bau Geo Umwelt > Lehrstühle > Leonhard Obermeyer Center > Lehrstuhl für Geoinformatik (Prof. Kolbe) > 2017

**entries:**