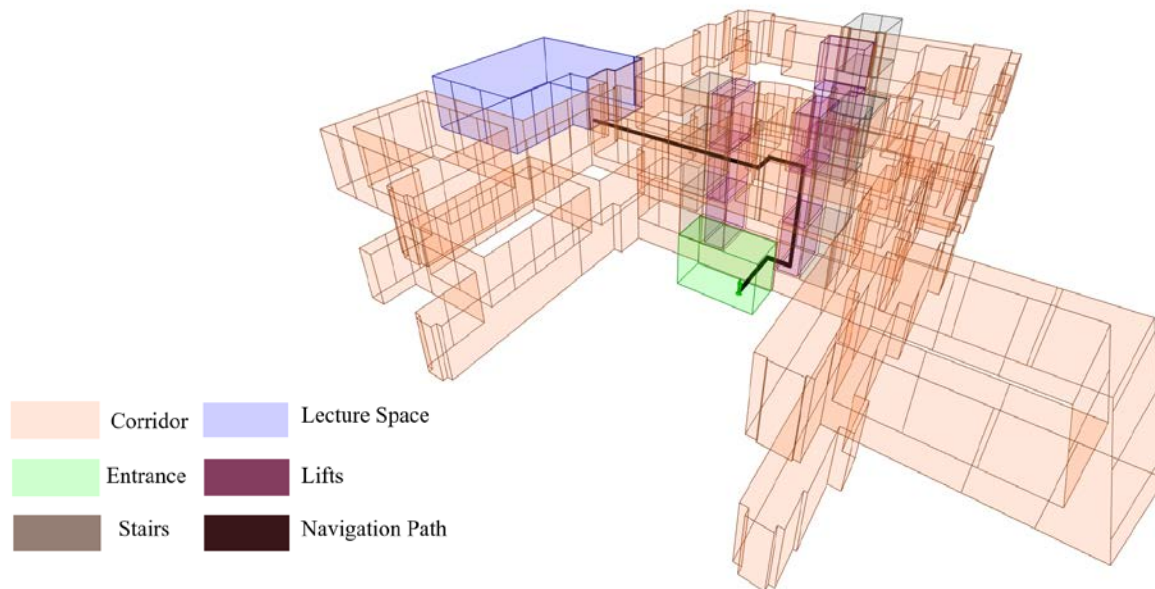


Supporting indoor navigation using access rights to spaces based on an integrated IndoorGML and LADM model

Keywords: Spatial Unit, Private Rights, Common Rights, Indoor, Navigation, Party

OTB Department / GIS-technology

Area of Research: Land Administration Domain Model and IndoorGML



Research Summary:

The research investigates the combined use of IndoorGML and the Land Administration Domain Model (LADM) to define the accessibility of the indoor spaces based on the ownership and/or the functional right for use. The users of the indoor spaces create a relationship with the space depending on the type of the building and the function of the spaces. The indoor spaces of each building have different usage functions and associated users. By defining the user types of the indoor spaces, LADM makes it possible to establish a relationship between the indoor spaces and the users. LADM assigns rights, restrictions, and responsibilities to each indoor space, which indicates the accessible spaces for each type of user. The three-dimensional (3D) geometry of the building will be impacted by assigning such functional rights, and that will provide additional knowledge to path computation for an individual or a group of users. As a result, the navigation process will be more appropriate and simpler because the navigation path will avoid all of the non-accessible spaces based on the rights of the party.

Research Methodology:

The methodology consists of five steps:

1. Define the research problem and the requirement specification.
2. Literature study and LADM country profile for Saudi Arabia.
3. Create a conceptual model IndoorGML-LADM and develop the Party package for the users of educational building and then for other type of building such as (shopping center, hospitals, transportation terminals).
4. Assessing the conceptual model by making a technical model and then a data test cases will be collected and loaded to a database. A prototype for 3D web-based and mobile apps will be developed and tested with real users data (feedback loop).
5. Final model, and reporting (PhD thesis).

Key Publication:

- Alattas, A., Zlatanova, S., Van Oosterom, P., Chatzinikolaou, E., Lemmen, C., & Li, K.-J. (2017). Supporting Indoor Navigation Using Access Rights to Spaces Based on Combined Use of IndoorGML and LADM Models. *ISPRS International Journal of Geo-Information*, 6(12), 384. doi:10.3390/ijgi6120384.
- Alattas, A., Van Oosterom, P., & Zlatanova, S. (2018). Deriving the technical model for the indoor navigation prototype based on the integration of IndoorGML and LADM Conceptual Model. *7th International FIG Workshop on the Land Administration Domain Model*, 246-266.
- Alattas, A., van Oosterom, P., Zlatanova, S., Hoeneveld, D., and Verbree, E.: Using the combined LADM-IndoorGML model to support building evacuation, *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLII-4, 11-23, <https://doi.org/10.5194/isprs-archives-XLII-4-11-2018>, 2018.



Abdullah Alattas

PhD started in: February, 2017

Master in Cartography (2014):

Technische Universität München, Research Group Cartography Vienna University of Technology and Institute for Cartography Technische Universität Dresden

Promoters:

Prof.dr.ir. P.J.M. van Oosterom
Prof. dr. Sisi Zlatanova (UNSW Australia)

Email: A.F.M.Alattas@tudelft.nl

Phone: +31 (0) 639898691

Main Question:

What is an optimal standard-based approach to enrich the IndoorGML semantic 3D model with LADM Rights, Restrictions, and Responsibilities to support the accessibility of the indoor spaces supporting navigation (and other applications) in different types of buildings?

Deliverables:

The aim of this research is to create the integration model of LADM-IndoorGML to provide a subdivision approach that take into consideration the right, restriction, and responsibility of the user to represent the navigation path based on the ability of users. A database with data from selected use cases will be devolved to assess the integration model and then a navigation prototype will be created to examine the subdivision approach. This research will produce the LADM country profile of Saudi Arabia.

Link:

<https://www.tudelft.nl/staff/a.f.m.alattas/>

Updated: December, 2018