

Denmark

Agency for Climate Data

AI-assisted building footprint change detection – strengthening GeoDanmark basic data

“Accurate and up-to-date building footprint information is essential for planning, climate adaptation, emergency preparedness, taxation, and a wide range of other public services. Using AI-supported computer-vision methods, we can make our core task of maintaining Denmark’s authoritative national basic data both easier and more effective. We combine aerial photos with existing building data using an AI model to highlight locations where new construction, demolition, or major changes are likely to have occurred. By identifying changes of building footprints systematically and in a more targeted way, we believe we can achieve up-to-date and consistent data, while freeing up time and resources.”

Rikke Hougaard Zeberg

Director General,
Agency for Climate Data,
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A collaboration between Denmark’s Agency for Climate Data and municipalities has enabled a faster path from real-world changes to updated national core geodata.

The GeoDanmark cooperation has developed and tested an AI-based method to identify potential building footprint changes, enabling the yearly update of authoritative building footprint data to be carried out more efficiently and with higher quality.

It combines aerial photos with existing building data and uses an AI model to highlight locations where new construction, demolition, or major changes are likely to have occurred. This allows the delivery of potential candidates for changes of building footprints that feeds directly into workflows for maintaining GeoDanmark basic data, enabling a reduction in manual reviews of data. This results in a more consistent dataset, with a faster path from real-world changes to updated national core geodata.

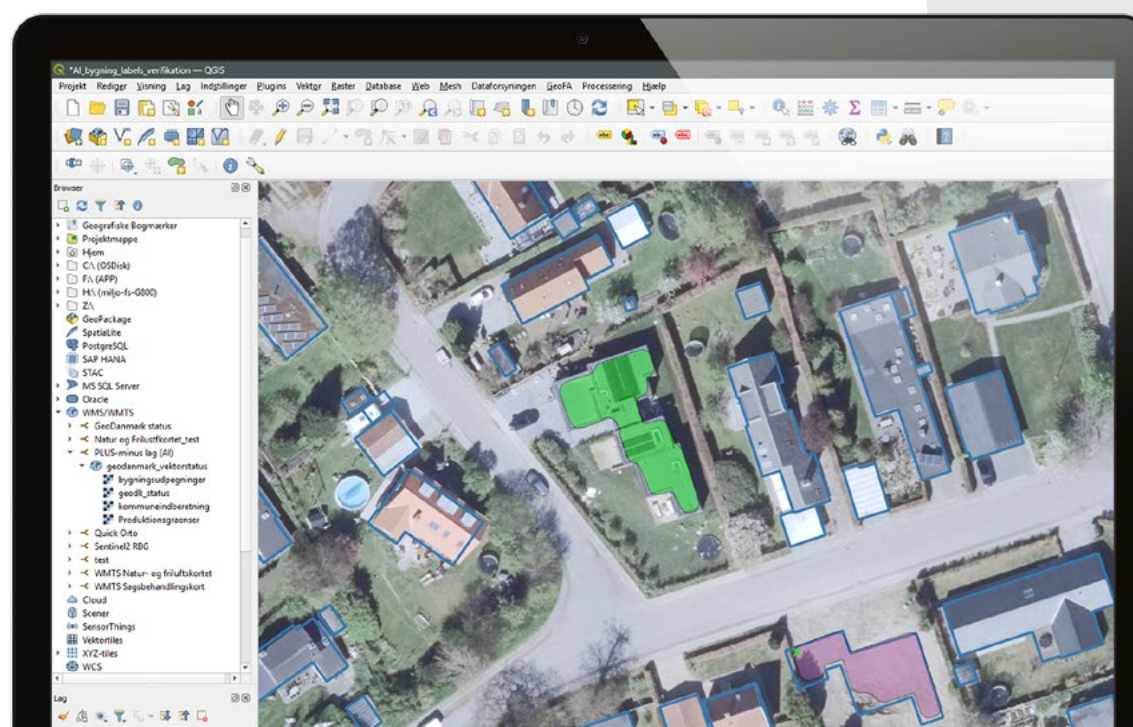
The AI-model is planned to be gradually improved through multiple rounds of testing, where the municipalities are involved in the verification process. The project is a part of a strategic initiative aimed at increasing the automation of the production and maintenance of core geospatial data.

Better building footprint data is believed to improve downstream analyses and decision-making and it is crucial for a more resilient and efficient geodata infrastructure, to support planning, climate adaptation, and a wide range of public services.

Collaboration with GeoDanmark

GeoDanmark is a collaboration between the Danish Agency for Climate Data and all Danish municipalities (98 in total). It provides a consistent, up-to-date geographic basic dataset covering approx. 70 features such as buildings, roads, watercourses and lakes. The GeoDanmark AI-model ensures practical, high-quality updates, which strengthens the shared data foundation and supports efficient use of resources across the entire geodata value chain.

The green polygon marks the area in which the AI model identifies a newly constructed building that has not yet been recorded in the GeoDanmark base dataset. The purple polygon marks an area in which a building is recorded in the GeoDanmark base dataset, but the AI model identifies that it has been demolished.



Benefits

- AI-supported building footprint change detection helps identify more building updates than traditional approaches, improving completeness and reducing blind spots in the national dataset.
- Identified potential candidates for changes of building footprints, replace broad manual scanning process, saving time and resources.
- More systematic identification of changes shortens the time to update authoritative data.
- Continuous feedback from verification during production enables the model to improve over time.
- The AI-approach establishes a clear pathway toward higher levels of automation, enabling better maintenance of building data.