

Improving Automatic Mapping Workflow for OpenStreetMap Missing Buildings in Sub-Saharan Africa

Objective:

The goal of this thesis is to figure out the strategies on how to improve automatic mapping workflow of OpenStreetMap missing buildings in sub-Saharan Africa by GeoAI methods and how to visualize and assess data completeness of volunteered geographical information.

Keywords: VGI, OSM, GeoAI, Deep Learning, Data Quality

Description:

Volunteered geographical information (VGI) is a valuable tool for a wide range of applications, including mapping, planning, and emergency response. OpenStreetMap (OSM), as the main actor of VGI, plays an important role for each map maker by providing open source, relatively complete and accurate geographical information. While OSM data can be very valuable, it can also have some challenges. One of the main challenges with OSM data is that it's incomplete or out of date within some areas because it is collected and maintained by volunteers. Therefore, it is literally important to evaluate its quality and reliability before using it for critical applications.

There is still incomplete or out-of-date data in sub-Saharan Africa where few volunteers collect and maintain data. It is important to fill gaps in OSM data for a number of reasons. First and foremost, incomplete or out-of-date data can lead to misunderstandings or errors, which can have serious consequences. For example, if emergency responders are using outdated or inaccurate maps, they may have difficulty finding their way to the scene of an emergency, which could delay response times and put lives at risk. Similarly, if planners are using incomplete or outdated data, they may make decisions based on inaccurate information, which could lead to inefficient use of resources or other problems.

It needs a huge amount of time to complete the OSM maps totally by volunteers. It's urgently needed to efficiently improve the existed mapping workflows. In the recent decade, deep learning and other machine learning methods have accelerated and improved human's work in terms of speed and accuracy. Combined with big geospatial data, GeoAI has a huge potential to improve the mapping workflows of VGI.

Research Sub-Objectives:

To improve automatic mapping workflow of OSM missing buildings in sub-Saharan Africa.

To develop an interface for map makers to observe and assess the data quality of OSM building data.

To explore the geographic generalizability of GeoAI models for automatic mapping.

References:

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