

# **Automated Building Footprint Extraction from High Resolution LIDAR DEM Data**

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## **ABSTRACT**

Geographic Information Systems (GIS) are used in the fields of urban planning, environmental management, agriculture, transportation, utilities etc. because of their ability to provide geospatial information organized in multiple layers such as digital image basemap, land use zoning, political boundaries, parcel maps, land cover, road network, building footprints, utility networks (e.g. water, sewage and electricity), topography, and green space. Some urban features like roads and buildings change with the time and it is therefore necessary to update this information. The goal of this research is to provide a robust automated method to extract commercial buildings from the high resolution DEM data with high quality, accuracy, and detection rates. This processing strategy uses three different detectors which are fused to obtain a final output. Though multi-detector fusion has been used previously for satellite imagery, it is completely new for the DEM data. All three algorithms are developed using a fuzzy logic approach. The results of our algorithm show that we have obtained 82% correctness, 73% completeness and 65% quality pixel wise and 82% correctness, 97% completeness and 65% quality object wise for the tuning images and similar results for the test images. This approach can be expanded for the extraction of residential buildings which is left for future work.