

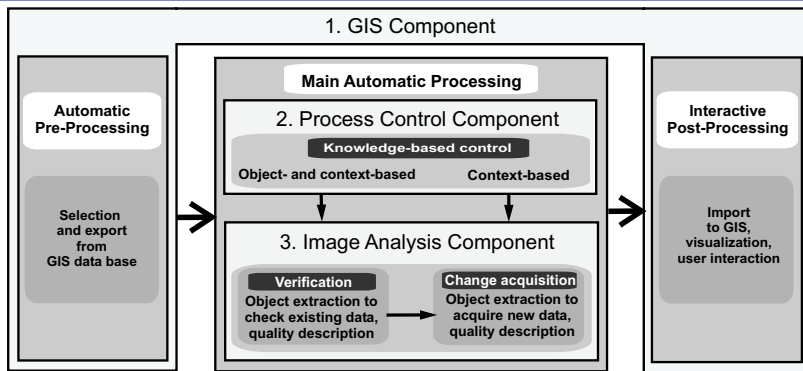
# WiPKA-QS: Automated Quality Control and Update of Geodata using Aerial Imagery



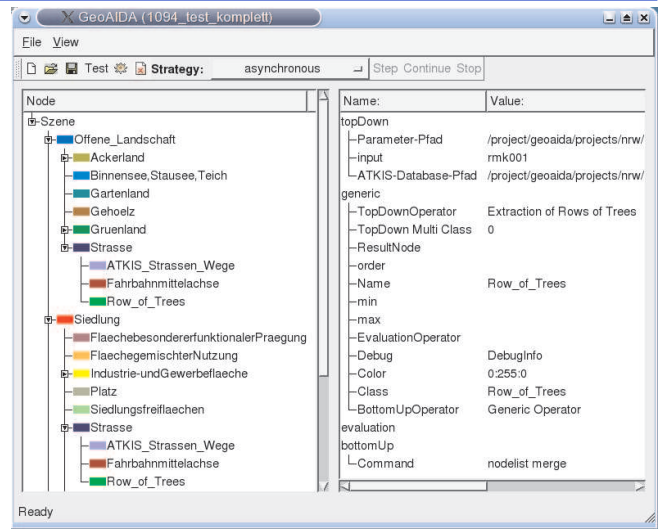
## Motivation

The value of digital geo-spatial datasets like the ATKIS basic DLM depends by and large on the data quality. In order to guarantee high standards work-intensive maintenance by highly qualified human operators becomes obligatory. The aim of a cooperation between the BKG and the University of Hannover was to develop a prototype system, which increases the performance of the operator significantly, thereby reducing the maintenance costs by raised quality standards. The approach is based on the automated extraction and verification of quality measures like geometrical accuracy, completeness and up-to-dateness from aerial images. During interactive post-processing the operator only checks the rejected objects and relies on accepted ones.

## System Design



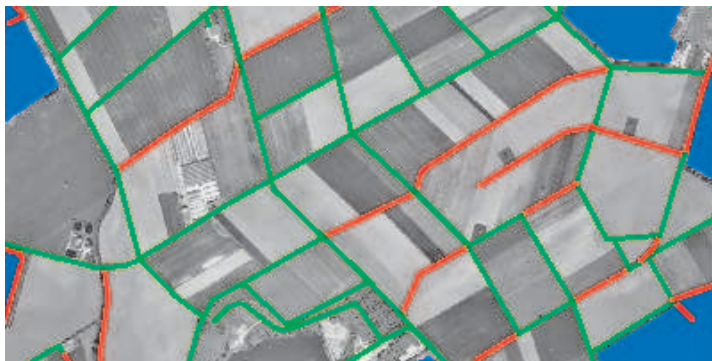
The system includes three modules: An Automatic Pre-Processing module, the Main Automatic Processing module and an Interactive Post-Processing module. GeoAIDA (right) is the core of the Process Control Component. It is a knowledge-based image interpretation system based on a semantic network. Area objects are extracted by texture operators and a building detection algorithm. Road objects are delineated by a topology supported line extraction algorithm.



Semantic net for knowledge-based system control (GeoAIDA).

## Example and Results

Fifteen scenes (60 km<sup>2</sup>) have been examined at BKG with the system. The results from eight scenes (32 km<sup>2</sup>) have been evaluated by a human operator: Original RGB-orthoimage (2x2 km) and results from object verification (green: accepted objects, red: rejected objects).



Results for road verification in rural area.

Road objects:	TOTAL: 2356 objects	Accepted by the system	Rejected by the system
Human operator	Accepted	65%	32%
	Rejected	1%	2%

~200% performance increase at  
1% false acceptance rate.



Analysis of suburban area incl. not yet acquired construction sites.

Area objects:	TOTAL: 1163 objects	Accepted by the system	Rejected by the system
Human operator	Accepted	69%	22%
	Rejected	5%	4%

~300% performance increase at  
5% false acceptance rate.

**Overall result: ≥200% performance increase at  
~1..5% false acceptance rate.**

## Contact

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