Generalising OS MasterMap® Rural Buildings to 1:50 000

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The Challenge

Develop a prototype to generate 1:50K DCM automatically from OS MasterMap® topographic and ITN data.
Agent Strategy

Top Level Agent

Urban Agent
  - Urban Area Agents
  - Urban Block Agents
  - Urban Building Individual and Amalgam Agents

Roads Agent

Rural Agent
  - Rural Building Cluster Agents
  - Rural Building Amalgam Agents
Urban Areas and Rural Clusters
OS MasterMap topography and ITN - source

Existing 1:50 000 scale raster – target style
Selection of Amalgamation Candidates

- Group buildings by proximity.
- Split proximity groups by separating features.
- Current selection is not ideal (e.g., buildings around the outside of a road bend need splitting)
- Plans to use agent approach to try out several groupings, perform the generalisation then choose the best result.
The Orientation of a Building Group

- 90 candidate orientations between 0 and $\pi/2$.
- Evaluate contribution of each building edge in group to each candidate orientation.
  - Longest edges have greatest contribution.
  - Take care near 0 and $\pi/2$ since these are “equal” mod $\pi/2$.
  - Group orientation is the candidate with largest total contribution.

Picture courtesy IGN France
Group Oriented Bounding Rectangles (GOBR)

- Delete building amalgam if area GOBR < deletion threshold.
- If both sides of GOBR < min side length, enlarge amalgam to min size length square.
- If one side of GOBR < min side length, enlarge both sides by same amount until shortest side complies.
Initial Squared Amalgam

Algorithm Results

Existing 1:50 000 Examples:
Simplified Squared Amalgam

- Identify amalgam concave corners.
- Apply a rectangular patch to the smallest concave corner.
- Continue process until all concave corner edges are above threshold.
- Result needs a local enlargement algorithm to ensure all edges are above threshold.
Final Positioning of Building Amalgams: Displacement + Geometry Adaptation

**Road Proximity** – buildings adapt their boundaries to the roads.

**Forest/Water Proximity** – adjacent features adapt their boundaries to the buildings.

**Inter-Building Proximity** – buildings stand alone or touch corner to corner.

1:50K Forests and Hydrology