Old Building Vectorization

- Manual tools for working on one building at a time
- Meant for producing accurate vector models
- Appeared in software 2003
- First tested on Helsinki Univ of Technology area
- 2.3 sq km originally took 3 days to vectorize
- With some improvement in tools, the same area took 1.5 days to vectorize in 2004
- One building was not vectorized due to irregular, small details
New Building Vectorization

• For airborne laser data + images
• Three goals:
  – Produce approximate 3D vector models automatically
  – Produce accurate 3D vector models faster than old tools
  – Vectorize buildings with non-planar roofs
New Building Vectorization

- Relies on following classification done:
  - Ground
  - Height from ground
  - Buildings

- Vectorize Buildings tool produces 3D vector models automatically
  - Can run as a macro for whole project

- Check Buildings Models tool lets you review automatic models one at a time against an airborne raw image
  - Tools for editing automatically generated models
New Building Vectorization

• Automatic vectorization can be used for production
  – First version that does something useful
  – Will improve gradually

• Manual editing is some distance from production level
Requirements on Data Set

• Clean data on the roofs:
  – No overlapping flightlines with significant mismatches
  – TerraMatch done
  – Cut overlap done

• Images for manual editing:
  – TerraPhoto mission and image list
  – Best possible positioning
  – Aerial triangulation done
Monoscopic measurement

- Roof plane equation is known
- Camera orientation is known
- We can measure points on the plane using one raw image
Buildings & Data Density

• Higher point density → more accurate models

• Low density < 2 points / m²
  – Good models of large buildings
  – More problems with small buildings
  – Loss of detail structures

• Medium density 2-10 points / m²
  – Good models

• High density > 10 points / m²
  – Accurate models
  – Can do details
Viikki

- NLS data from Viikki, Helsinki
- About 0.7 points / m²
Turku Area

- Close to 2000 km² of NLS data
- 3 billion points -- 1.5 points / m² after cut overlap
- Matching of flightlines done
- Automatic ground done – no manual editing
- Automatic building classification do – no manual editing
- Automatic vectorization done – no manual editing
- Vectorization took 6 hours on notebook & USB drive
Jönköping

- Blom TopEye, Sweden
- 400 m altitude
- About 10 points / m² after cut overlap
- Images with 4.5 cm pixel size