3D Building Models: An Investigation into the Development of a 3D GIS Model for Ordnance Survey

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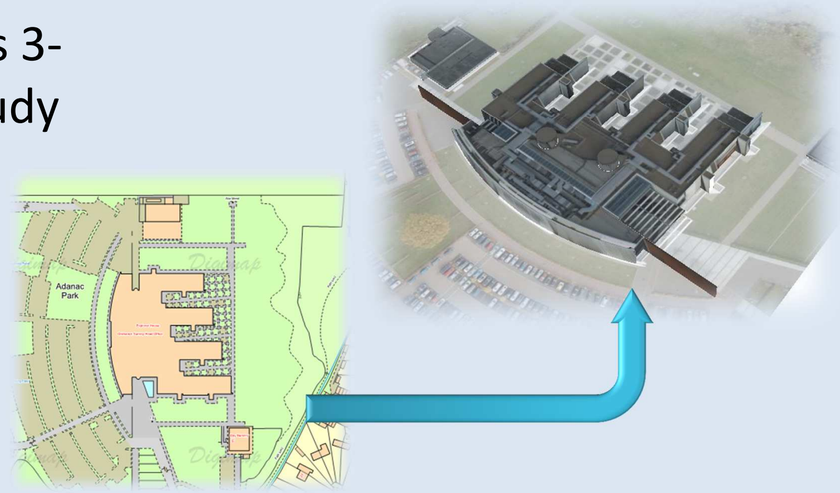
1. Introduction

Geospatial data is traditionally presented in 2D whereas the real world is 3-dimensional. Digital tools are now available for creating 3D data. This study evaluates different approaches to 3D modelling to generate 3D data for use in Geographic Information Systems (GIS).

Aims:

- To evaluate 3D geospatial modelling tools for ease of use, quality of outputs and compatibility with GIS formats
- Produce a 3D model of Ordnance Survey's Head Office



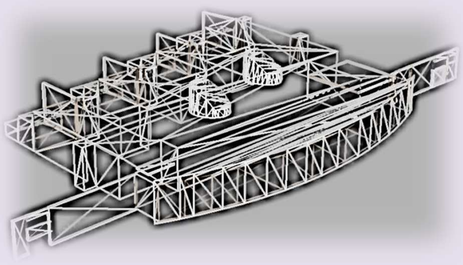
2. Methods

Automation

Automatically generate buildings using point cloud software from overlapping oblique aerial imagery and extract textures.

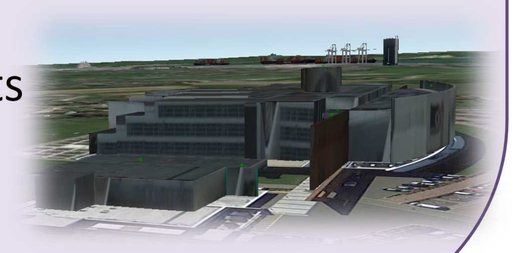
Manual

Using Tridicon, SketchUp and SOCET GXP collect 3D building data using photogrammetric and modelling tools available.



Export

Evaluate the methods and formats available for model export and assess their usefulness in GIS.



3. Results

- Automated processes produced incomplete outputs with very limited attribution.
- Manual modelling enabled the creation of models with geometry, attribution and texturing to a varying degree.

- KML/KMZ and COLLADA were the two best formats to export models for quick use.
- CityGML was the most comprehensive format but would require transformation by the end-user.
- Alternative options are available if texturing or attribution is not required.

4. Conclusion

Three recommended models and software to use:

1. Tridicon photogrammetric software producing a model with geometry, attribution and texturing exported in CityGML. This output can be used in a high-tech analysis package for GIS and non-GIS users alike.
2. Model for GIS experts containing only geometry and attribution created using SOCET GXP in shapefile format. The model can be used as a spatial analysis tool by emergency services through to insurance companies.
3. Agisoft point cloud software, when the model is to be used as a visualisation tool with only geometry and texturing created automatically.

Ordnance Survey

www.cranfield.ac.uk/courses/masters/geographical-information-management.html

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