

Automated Site Plan Extraction from TLS Point Clouds

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Outline

- **Motivation**
- **Approach**
 - Overview
 - Description
- **Results**
- **Outlook**

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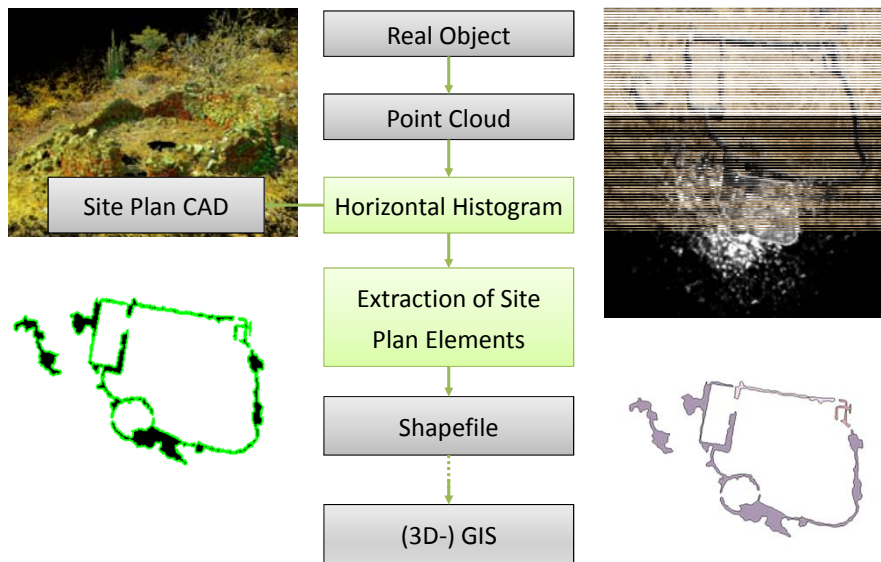
Motivation

- Increased use of laser scanning in archaeology for
 - Documentation
 - Analysis
 - ...
- Challenge of data handling
 - Data size versus relevant information
 - Automation is needed

How to get a georeferenced site plan in no time?

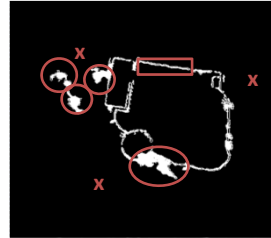


Approach

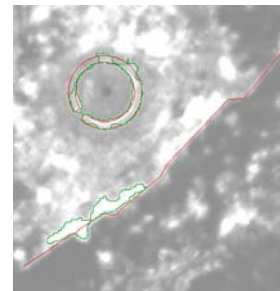
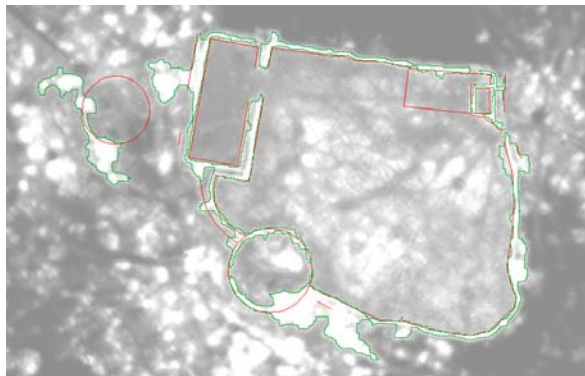


Approach

- Generation of horizontal histogram
- Thresholding → binary image
- Extraction of site plan elements
 - Multiple thresholds
 - Segmentation
- Morphological operations
 - Erosion
 - Dilation



Results

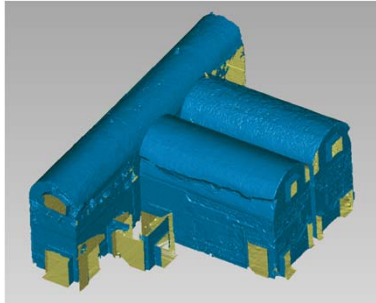


— Automated extraction
— Manual interpretation

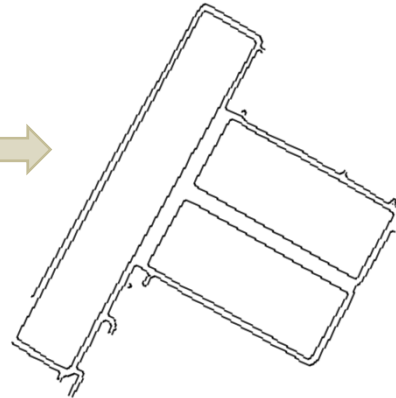
St. Maria, Laramate, Perú



Results



Domus Aurea, Rome, Italy



Conclusions

- Chosen approach works well for vertical walls
- Other vertical objects connected to the walls cannot be removed automatically (e.g. plants)
- Only areas containing parts of a wall remain in the site plan
- Estimated accuracy
 - historical, well defined walls → 1 - 10 cm
 - other, less well defined walls → 10 - 20 cm
- ➔ Site plans can be automatically generated based on laser scanner data



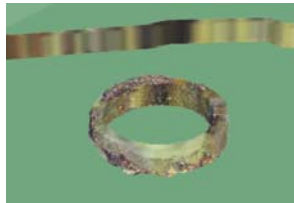
Outlook

– Improvement of extraction algorithm

– 2D GIS analysis



– 3D Reconstruction



**Thank you for your
attention!**

