

Potree Viewer

File Edit View Window Help

potree.org - github - twitter 1.7

EN - FR - DE - JP - ES - SE

Appearance

Point budget: 3,523,000

Field of view: 60

Eye-Dome-Lighting

Enable

Radius: 1.6

Strength: 0.7

Opacity:

Background

Skybox Gradient Black White None

Other

Splat Quality

Standard High Quality

Min node size: 0

Box

Lock view

Tools

Measurement

Show/Hide labels

Show Hide

Clipping

Clip Task

None Highlight Inside Outside

Clip Method

Inside Any Inside All

Navigation

Point Clouds in Education

MSc Geomatics / MSc GIMA

Update 2023-2024

Edward Verbree

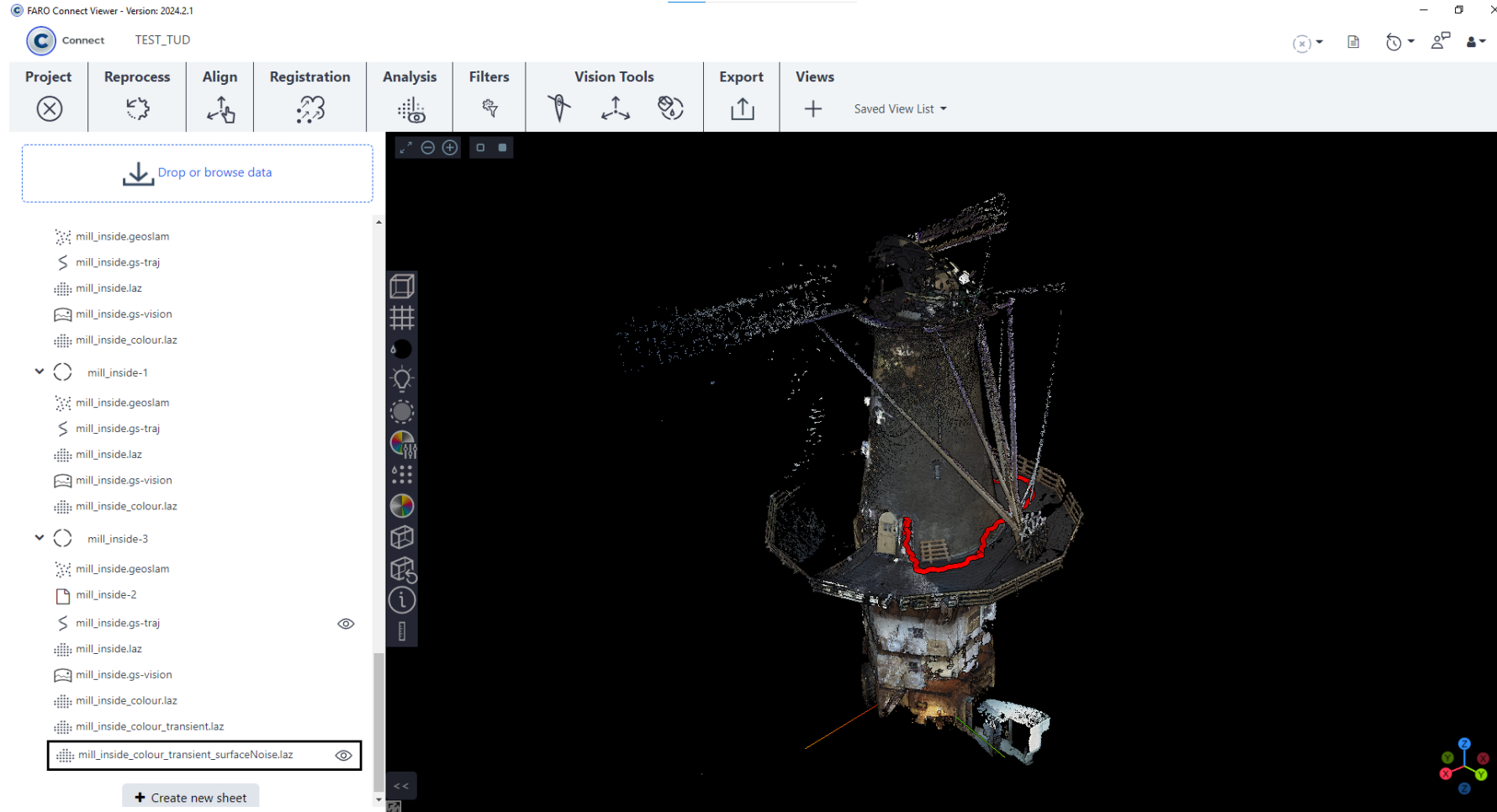
Point Clouds in Education – Update 2023-2024

Content

- Point Cloud Hardware - Upgrade
 - Geoslam ZEB Horizon RT Vision
- Education: MSc GIMA & MSc Geomatics
 - Research embedded in Education ?
- MSc GIMA: Module 6 & Thesis Projects
- MSc Geomatics: Synthesis Project & Thesis Projects

Point Cloud Hardware in Education

GeoSLAM Zeb Horizon - Vision

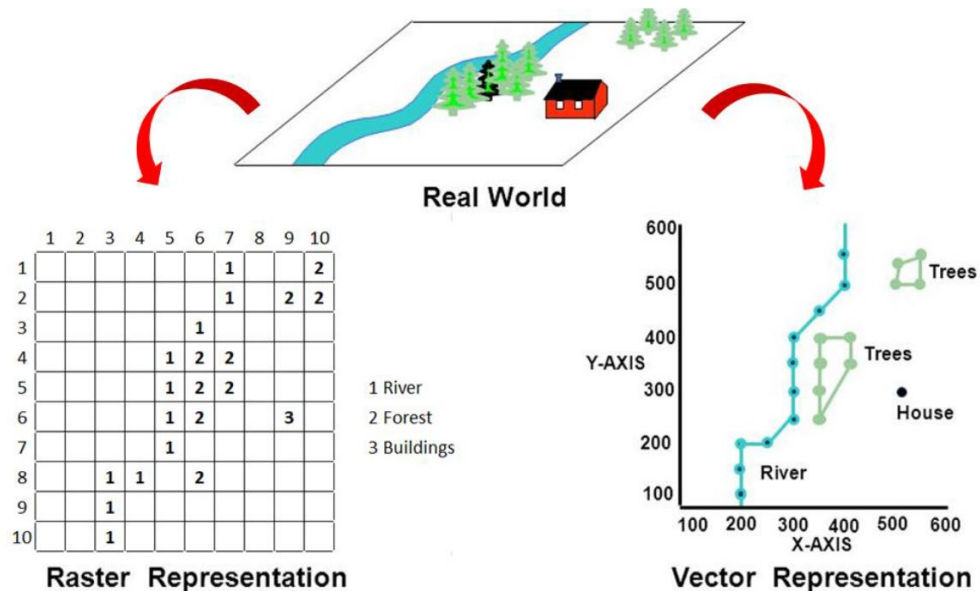


GEO1002 GIS and Cartography

Raster, Vector ... and beyond. But where are the Point Clouds?

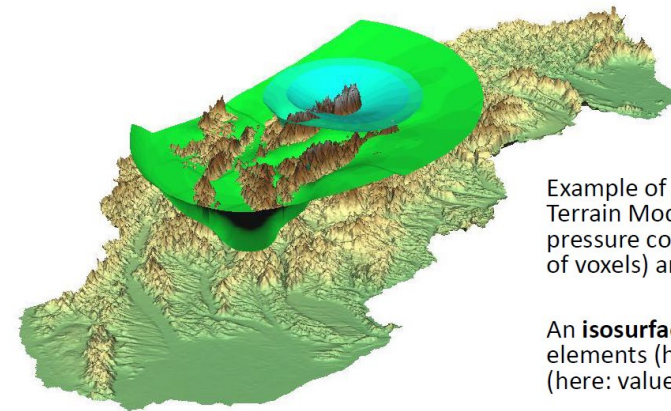
GIS data

Raster and vector data model



GIS data

Dimensions: 2.5D, 3D... and beyond



Example of a **2.5D raster-based DTM** (Digital Terrain Model) upon which isosurfaces of air pressure computed from a 3D grid (i.e. made of voxels) are overlaid

An **isosurface** is a surface that contains all elements (here: voxels) having the same value (here: values of air pressure)

Image source: Defense Mapping School, National Imagery and Mapping Agency

Point Cloud Hardware in Education

iPad 12 Pro – Scaniverse – Gaussian Splats

Scaniverse introduces support for 3D Gaussian splatting

Create photorealistic 3D scenes of the world from your phone

March 20, 2024

We're excited to announce 3D Gaussian Splatting in [Scaniverse](#), available today [on the App Store](#).

Scaniverse started with the ambition to bring 3D content creation to everyone, inspiring users to capture and share the world. To make this experience even more immersive and exciting, we're excited to announce support for 3D Gaussian Splatting in Scaniverse 3.0 to help you recreate high quality real world scenes directly on your mobile device, all within a few minutes.

Olli Huttunen – Road map of Gaussian Splatting possibilities

<https://www.youtube.com/watch?v=TB4AjE0w5Xc>

<https://www.youtube.com/watch?v=DQGtimwfpIo>

<https://my.spline.design/untitled-67883b1a43e3efc52206ba2bc4a49956>

<https://www.youtube.com/watch?v=TGZIKPdFZQY>



Road map of Gaussian Splatting possibilities



Olli Huttunen
11,7K abonnees

Geabonneerd

450



Delen



Downloaden



Fragment







ChatGPT in Point Cloud Education:

What are the main research questions in nD Point Cloud research?

- Research on nD point clouds focuses on developing new methods and techniques for capturing, processing, analyzing, and visualizing point cloud data with additional dimensions of information. Some main research questions in this field include:
 - Data Capture: How can we effectively capture nD point cloud data using different sensors and platforms?
 - Data Processing: How can we process and analyze nD point cloud data to extract useful information and features?
 - Data Fusion: How can we combine different types of nD point cloud data to create more comprehensive and accurate models of the environment?
 - Data Visualization: How can we effectively visualize and interact with large, complex nD point cloud datasets?
 - Applications: How can nD point clouds be used to support decision-making and solve real-world problems in fields such as remote sensing, robotics, and computer vision?
 - Scalability: How can we scale up the methods and techniques developed for nD point clouds to handle large datasets and real-time processing.
 - Quality assessment: How can we evaluate the quality of nD point clouds in terms of accuracy, completeness and other criteria, and how can we improve the quality of the data.
 - Machine Learning and Deep Learning: How can we use machine learning and deep learning techniques to analyze nD point clouds and extract information from it.

ChatGPT in Point Cloud Education:

Why is Gaussian Splatting important in geomatics education?

- Gaussian Splatting is important in geomatics education because it enables efficient 3D reconstruction and visualization of spatial data, especially for large datasets typical in the field.
- It supports real-time rendering, enhancing interactive learning experiences, and enables students to work with complex data on standard hardware.
- The technique's versatility benefits cross-disciplinary applications like GIS, urban planning, and environmental monitoring, while also preparing students for future innovations in geospatial technology.
- By learning Gaussian Splatting, students gain a relevant, adaptable skill set that bridges traditional geomatics and emerging digital modeling methods.
- While Gaussian Splatting is valuable for advanced visualization and interactive applications, point clouds are fundamental in geomatics education because they represent the primary spatial data structure.
- Educators typically prioritize point clouds for their foundational role, with Gaussian Splatting introduced as a supplementary technique for students aiming to explore real-time or computationally optimized 3D visualizations.

MSc GIMA & MSc Geomatics

Point Cloud Research embedded in Education

- Module 0 Intro
- Module 6 Advanced Applications
- Module 7 Thesis
 - <https://studenttheses.uu.nl/browse?type=subject&value=Geographical+Information+Management+and+Applications+%28GIMA%29>
- GEO1002 Sensing Technologies
- GEO1004 3D Modelling of the Built Environment
- GEO1006 Geo Database Management Systems
- GEO1011 Synthesis Project
- GEO2020 Thesis
 - <https://repository.tudelft.nl/islandora/search/point%20cloud?collection=education>

MSc GIMA: Module 6 & Thesis Project

MSc Geomatics: Synthesis Project & Thesis Project

GIMA Module 6 2022-2023



Module 6

Visualization and Exploration of student rooms through point clouds

Supervisor: Edward Verbree

Algan Yaşar, Emma Vos & Eric van der Zijden

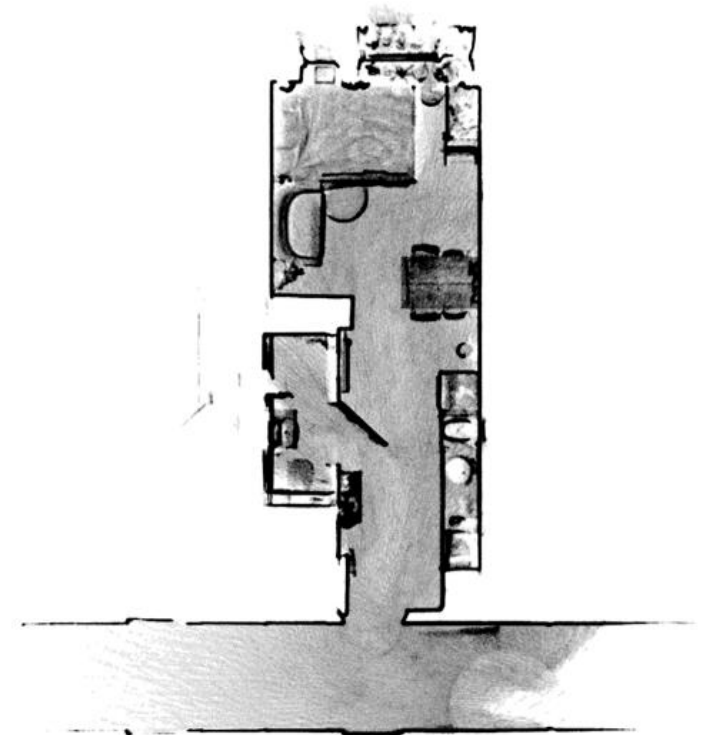
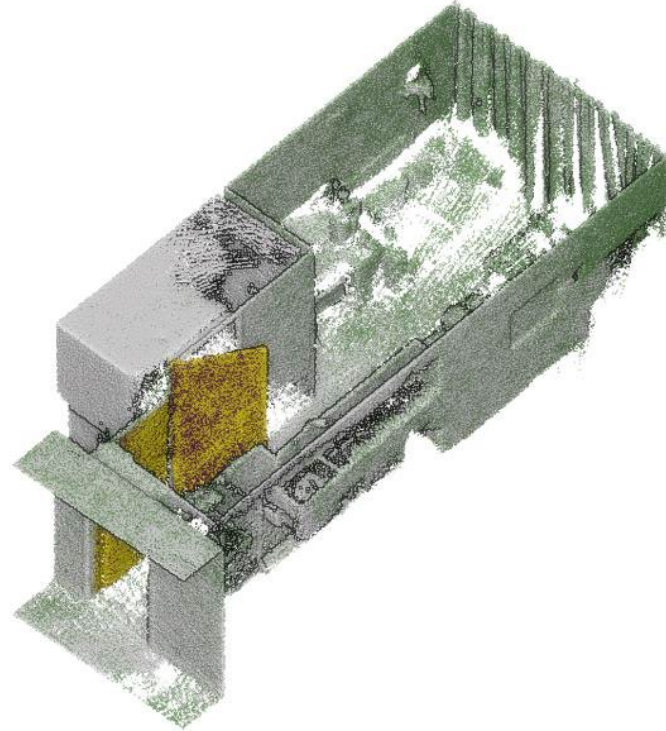
6248861 – a.m.yasar@students.uu.nl

1608886 – e.vos@students.uu.nl

6274250 – e.c.vanderzijden.uu.nl

23 June 2023

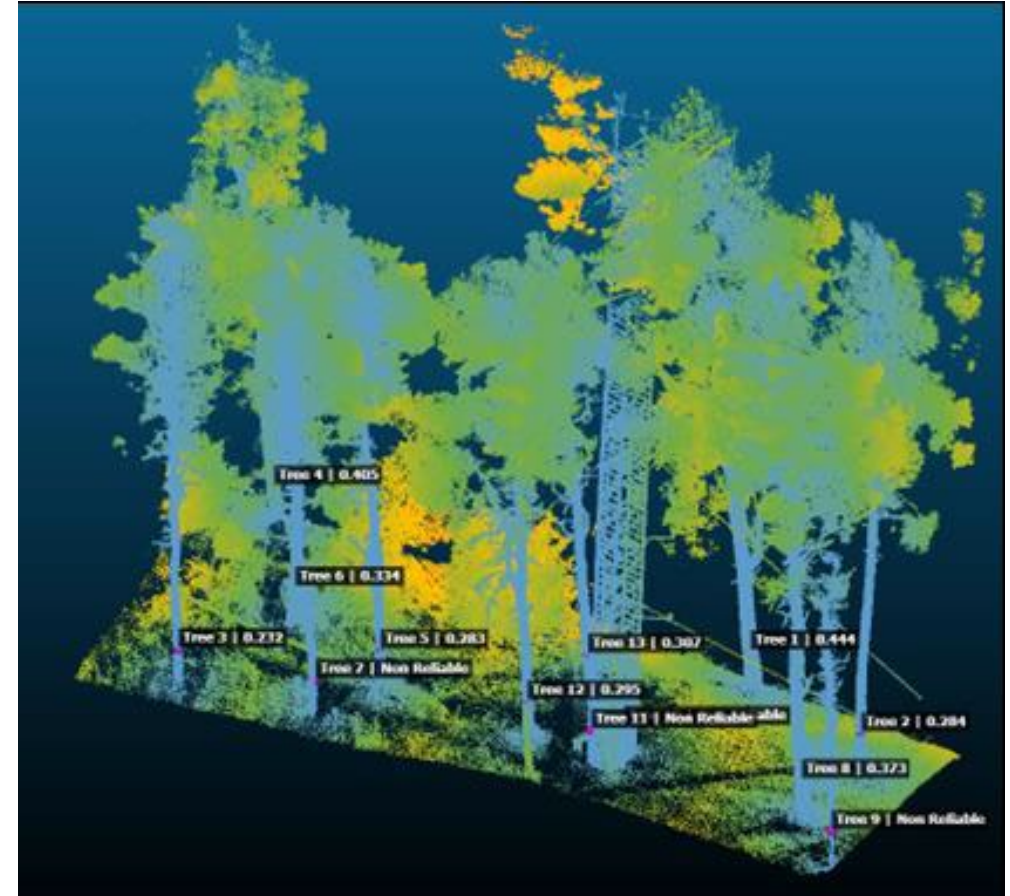
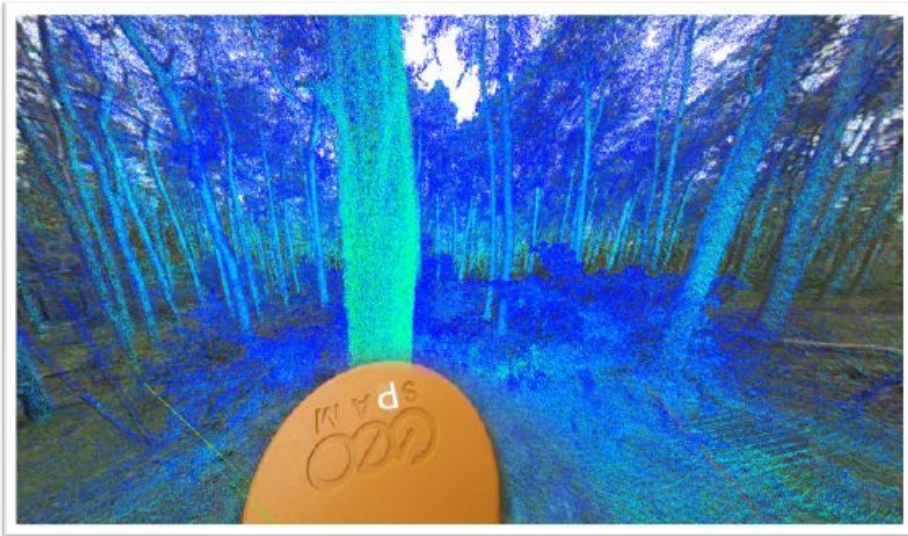
Version 1.0



GIMA Module 6 2023-2024

The value of (time-series) point cloud data in understanding forests dynamics.

“Capture the mystery of forest dynamics through LiDAR”



Bhola, R.R.(Roiché) r.r.bhola@students.uu.nl

Huang, J. (Jianhui) j.huang8@students.uu.nl

Huisman, S.P. (Sybren) s.p.huisman@students.uu.nl

Morabet, A. El (Abdelouahed) a.elmorabet@students.uu.nl

Spliethof, N (Nico) n.spliethof@students.uu.nl

GIMA Thesis - Niek Manders



Comparing AHN point clouds for their performance in representing 3D buildings in Zuid-Holland

A quantitative and qualitative performance review between AHN3 and AHN4

Master Thesis

Author: Niek Manders
Student Number: 4237307
Email: n.manders@students.uu.nl
Supervisor: Edward Verbree
Responsible Professor: Peter van Oosterom



Figure 14 Mill in Schiedam represented as picture, 3DBAG object and corresponding AHN3 point cloud



Figure 15 Mill in Bergambacht represented as picture, 3DBAG object and corresponding AHN3 point cloud

GIMA Thesis - Algan Yasar



Direct Use of Indoor Point Clouds for Path Planning and Navigation Exploration in Emergency Situations

Master's Thesis – May 2024

Author

Algan Mert Yasar

Supervisors

ir. E. Verbree

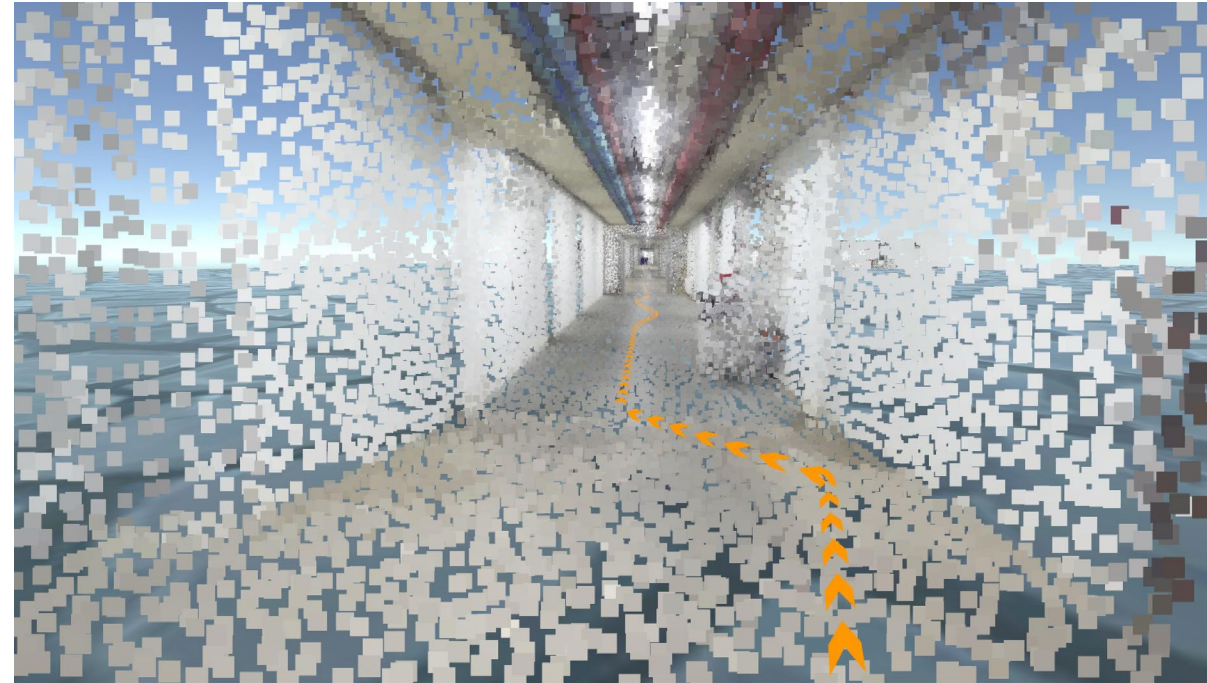
ir. R. Voûte

Responsible Professor

Prof.dr.ir. P.J.M. van Oosterom

University

Delft University of Technology



Algan Yasar, Robert Voûte, Edward Verbree, **Direct Use of Indoor Point Clouds for Path Planning and Navigation Exploration in Emergency Situations**, Chapter in: The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLVIII-4/W11-2024, pp. 175-181, 2024.

[pdf](#) [link](#) [doi](#) [bib](#)

Geomatics Syntheses Project 2023

Exploring efficient methods of visualizing, annotating and interacting with the objects of human anatomy using its point cloud representation

Pointcloud based anatomy

Synthesis project report

Gees Brouwer (4726693) - Sharath Chandra Madanu (5722101) - Susanne Epema (5655730)
- Vidushi Bhatt (5862124) - Qiwei Shen (5687500)

TU Delft, Faculty of Architecture and the Built Environment
The Netherlands

Supervisors: Edward Verbree & Peter van Oosterom
Enatom contact: Bastiaan Hofsteenge

November 16, 2023

Geomatics Syntheses Project 2024

Synthesis Project - Geomatics

Integrating Gaussian Splatting with
Semantic Labels for Heritage BIM

Marieke van Arnhem, Qiaorui Yang, Shawn Tew,
Xiaduo Zhao, Walter Kahn

November 2024



Figure 13: Overview of the 3D reconstruction in Blender (Best viewed in Adobe Acrobat)

Geomatics Syntheses Project 2024

Explorative Point Cloud Virtual Reality: Immersive Visual Insight

Evaluating User Perception, Interaction, and Immersion with VR and Omnibase

Synthesis Project (GEO1101) - Report

Group 5

Michalis Michalas - 6047378

Lotte de Niet - 5025354

Javier Martinez - 6055613

Zhuoyue Wang - 6093590

Bart Manden - 5236371



Geomatics Thesis – Irina Gheorghiu

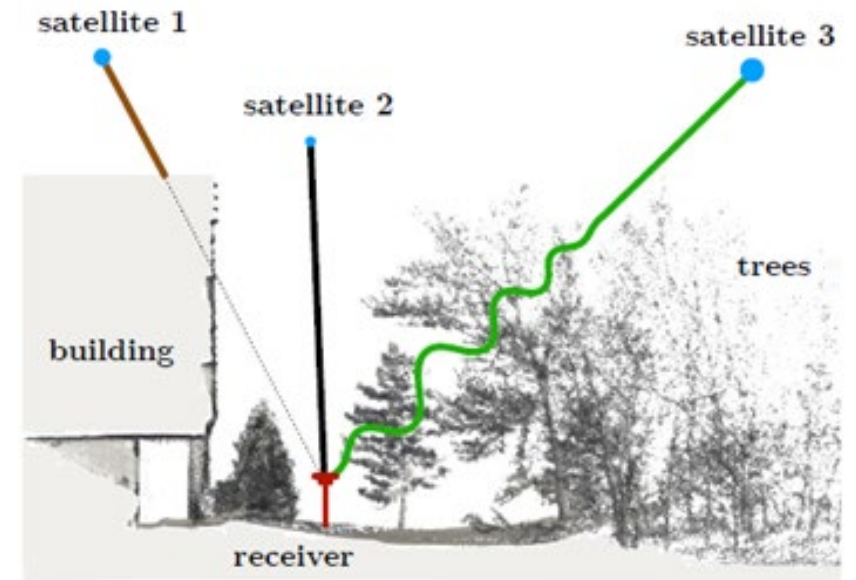
MSc thesis in Geomatics

Analysis of the visibility of GPS satellites in the urban environment using point cloud representation

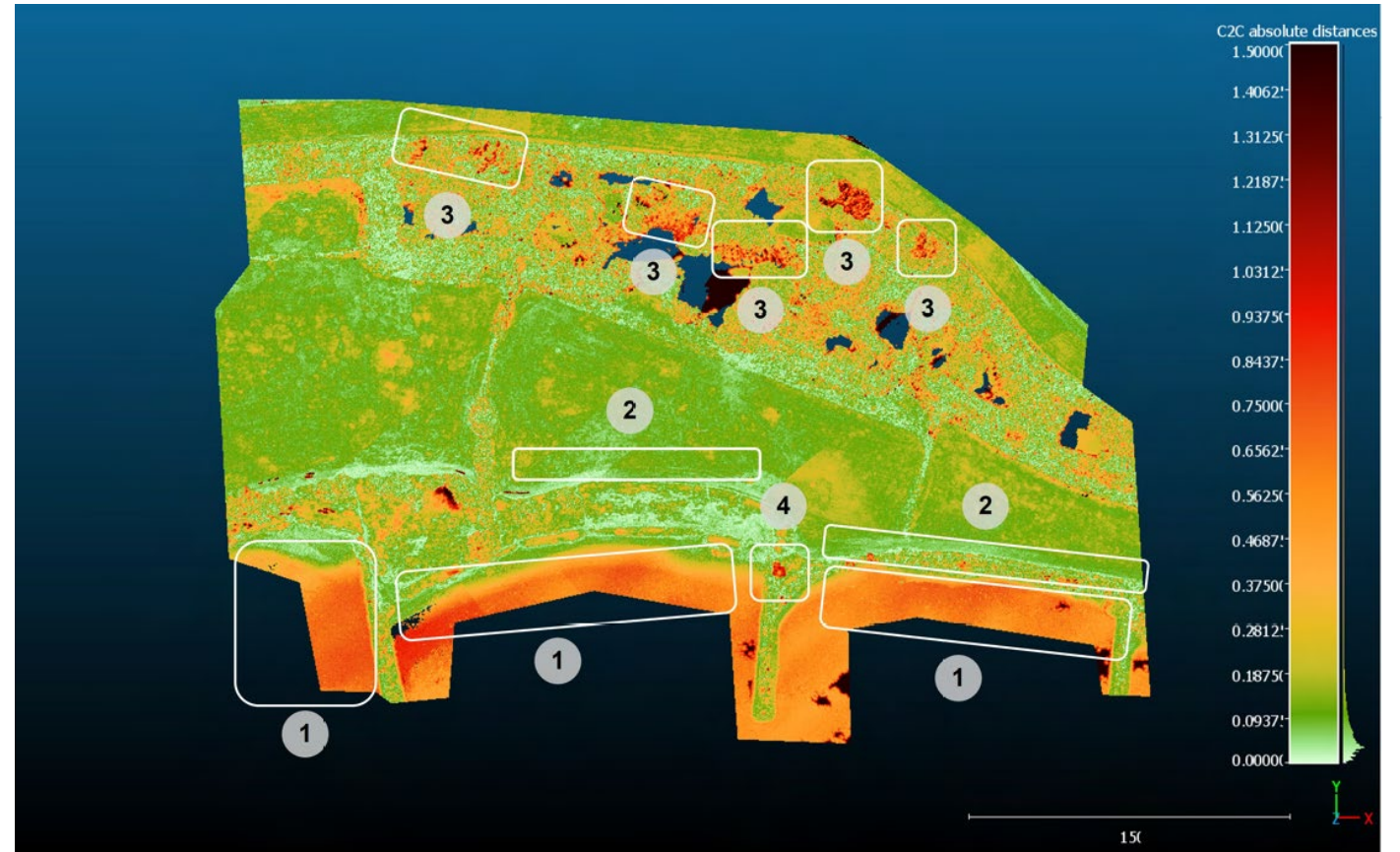
Irina Gheorghiu

December 2023

A thesis submitted to the Delft University of Technology in
partial fulfillment of the requirements for the degree of Master
of Science in Geomatics



Geomatics Thesis – Pam Sterkman



2024-2025

GIMA Module 6 / Theses

Geomatics Syntheses Project / Theses

To be continued