Supported by:

Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag

Pointly Introduction

POINTLY

POINT OUT WHAT MATTERS

Geo Data Science Technology

Made in Germany by Supper & Supper GmbH

Pointly is a SaaS product of Supper & Supper GmbH.

The company is one of the leading full-service data science service providers in Germany and develops customized solutions in the areas of machine learning, artificial intelligence, process optimization and digital transformation.

Check out www.supperundsupper.com & www.pointly.ai for more information.

What is Pointly?

SaaS solution & Services

Pointly

Pointly SaaS solution

accelerated manual classification tool

intelligent, cloud-based software solution to manage and classify 3D point clouds

Your data is safe with us.
Building on Azure's 256-bit AES encryption standard and advanced threat protection, we protect your data whether in storage or in transit. Your user identity is managed through Azure B2C and ensures that only you have access to your data.

Pointly Services

on-demand advanced 3D point cloud services, tailormade for you

- Acquisition
- Labeling
- Detection
- Training
- Analysis
- Conversion

What is Pointly?

SaaS solution & Services

POINTLY

Pointly Services

Implementation of customer-specific projects/requirements as consulting projects

input for the market-driven development of Pointly SaaS features

Pointly SaaS solution

POINTLY 1.0 for efficient manual classification of 3D point clouds

Pointly 2.0

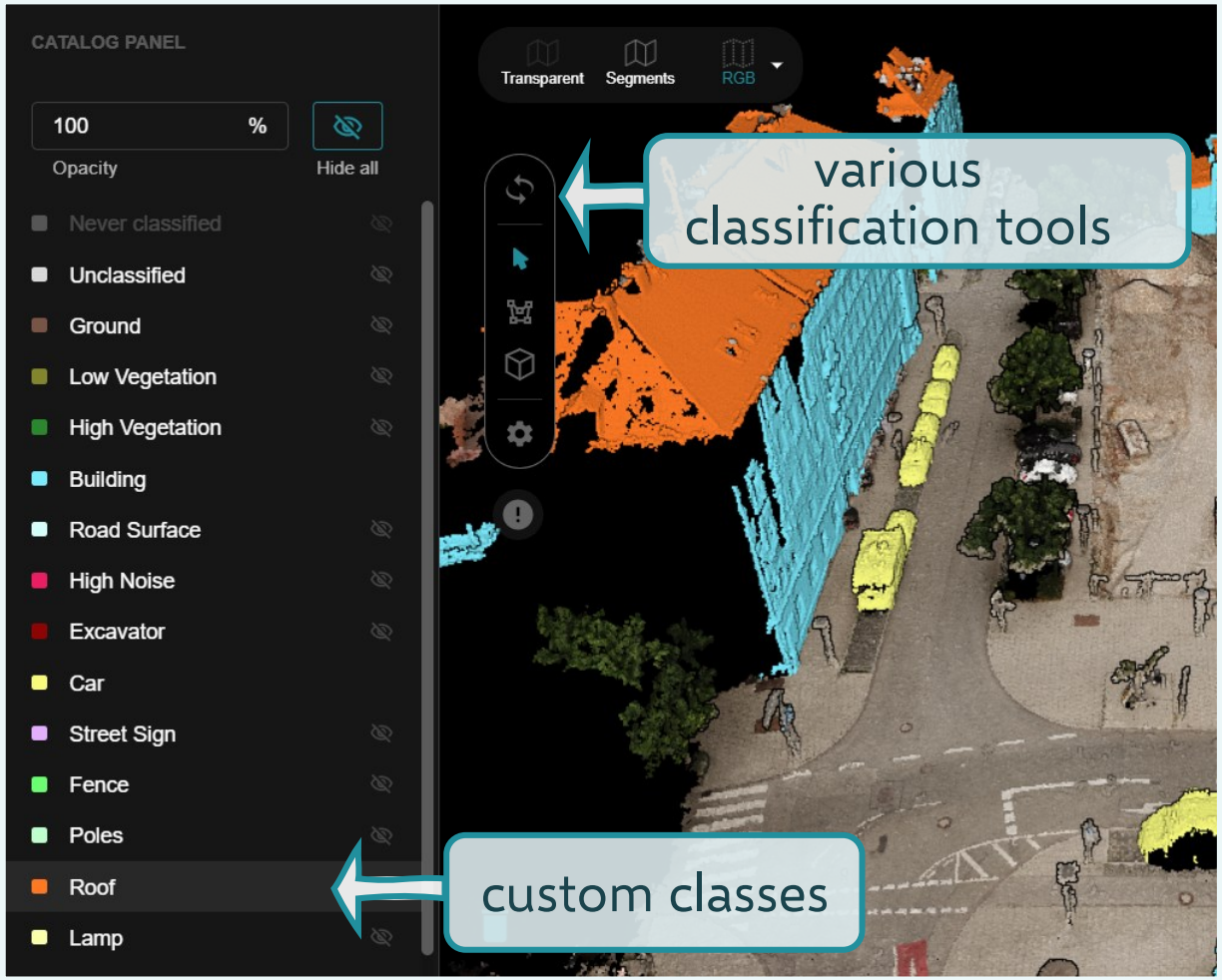
Pointly (SaaS)

- Overview
- Key features
- Pointly's interface
- Roadmap

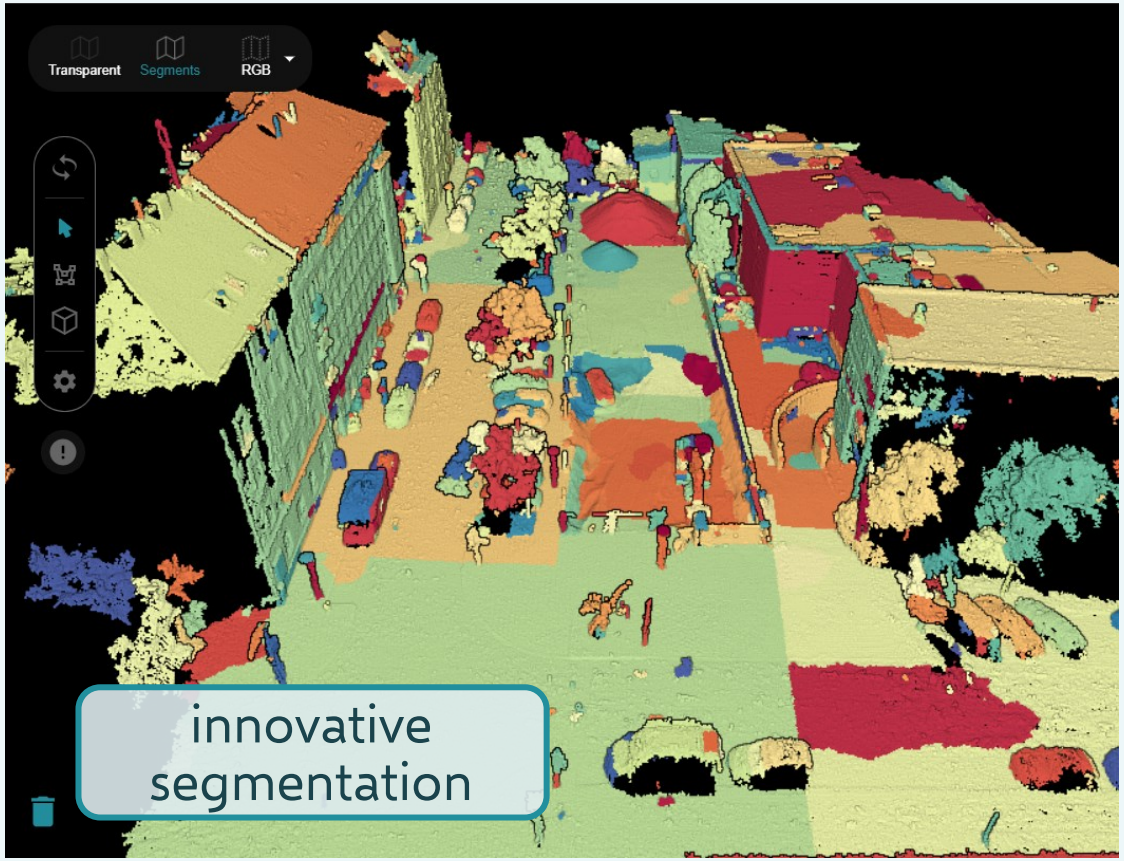
POINTLY

Pointly 1.0

Current state of Pointly



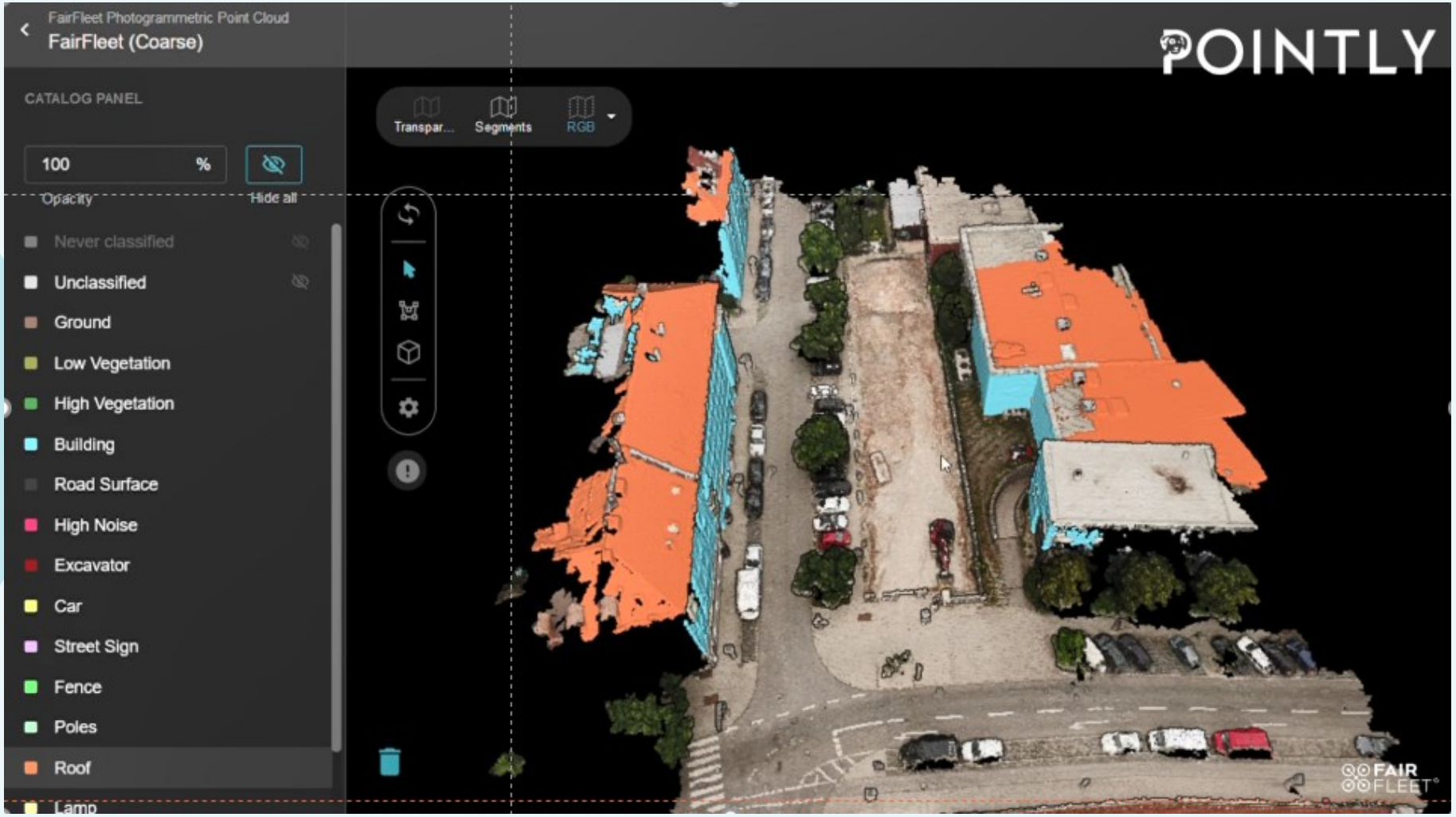
Easy, fast and custom manual classification

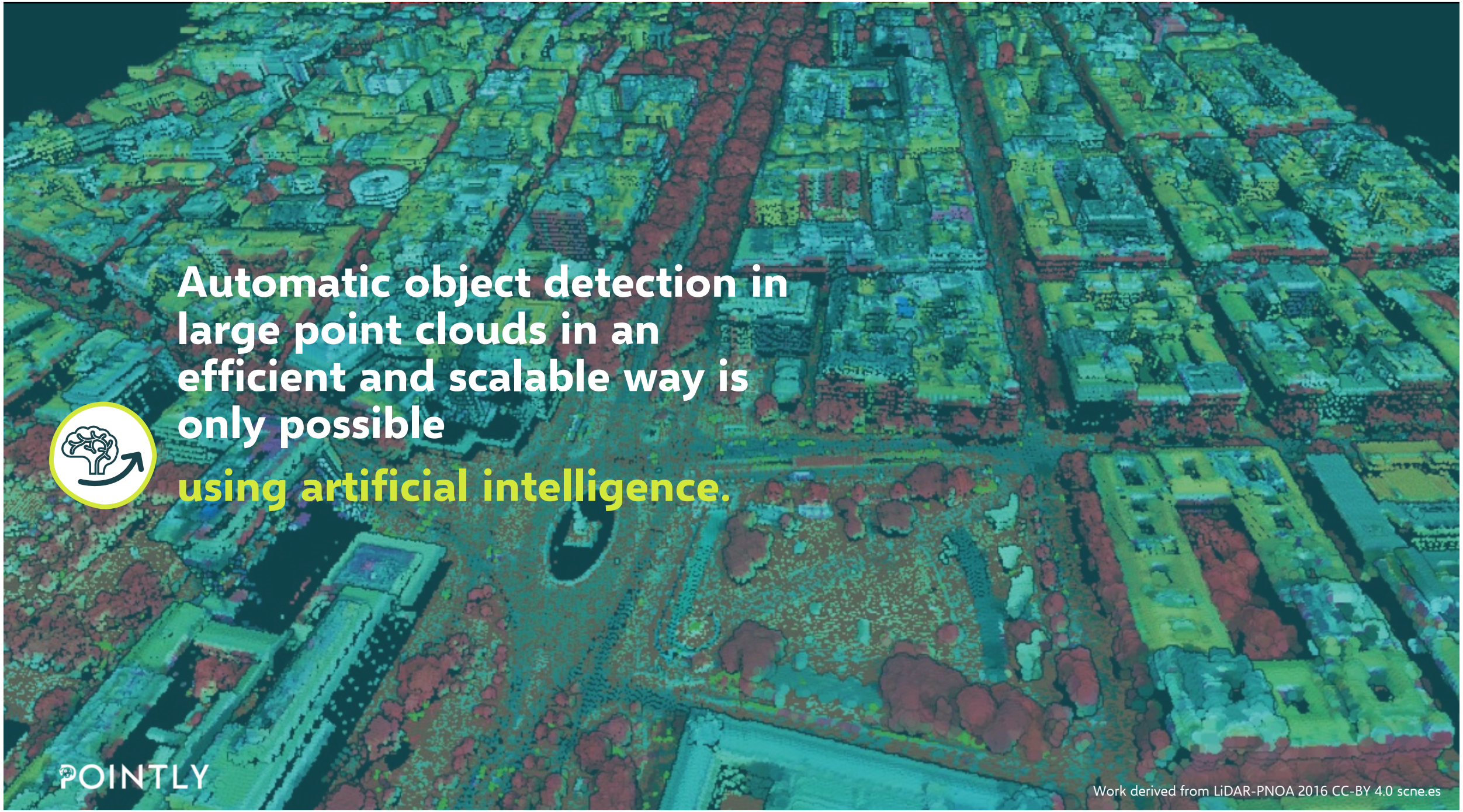


Pointly SaaS

Next level 3D point cloud classification

Manually classify your point clouds **faster and more precise than ever before.**



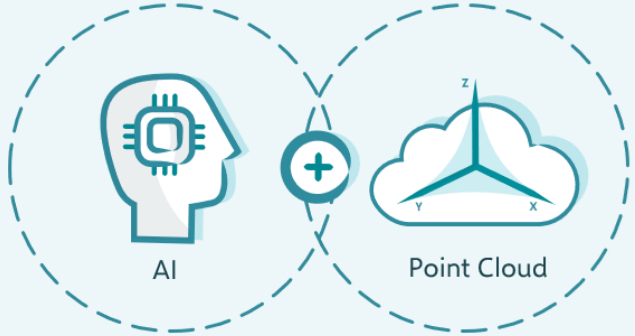

Automatic object detection in large point clouds in an efficient and scalable way is only possible
using artificial intelligence.
POINTLY
Work derived from LiDAR-PNOA 2016 CC-BY 4.0 scne.es

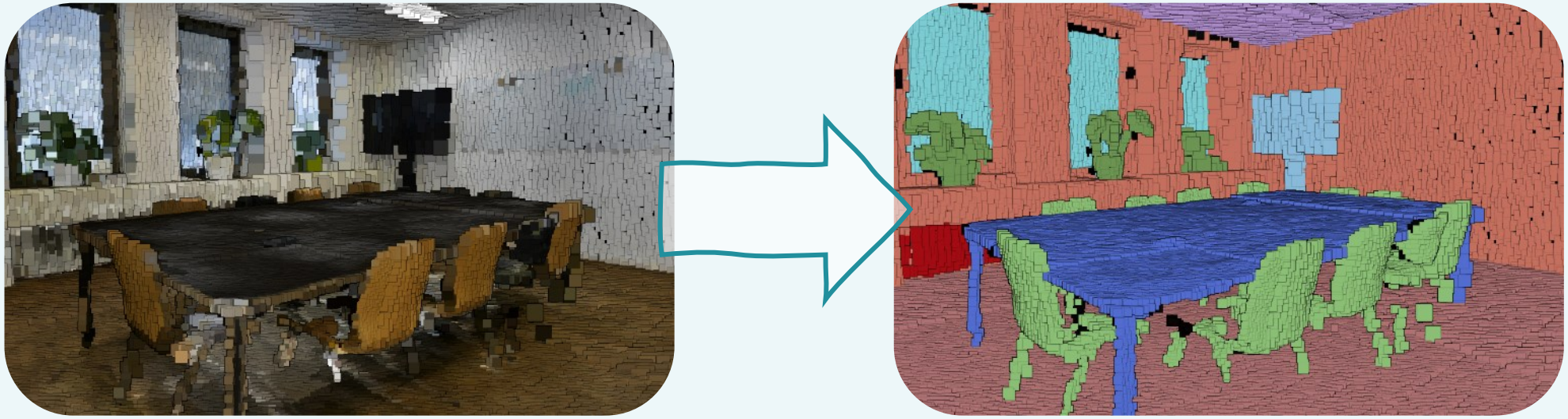
The need for training data

Deep Learning on 3D point clouds

Automated classification and object detection

- Large scale object mapping
- Generating inventories of assets
- Monitoring of changes





Sample Data from NavVis
https://www.navvis.com/resources/specifications/navvis-vlx-sample-data

Pointly SaaS

Pointly is an intelligent, cloud-based software solution to manage and classify **3D point clouds of all types.**

Save time

when classifiying point clouds

Coming soon

Train AI models

with individual classes

Save money

when generation data products

Get Insights

by analysing the results

Pointly SaaS

Key features

AI-assisted labelling
Pointly will process your point clouds and make it as easy as never before to label even the last point with the correct class.

Smooth 3D visualization
Through browser-based and state-of-the-art visualization engines you can work with point clouds of up to billions of points in an uncompromising way.

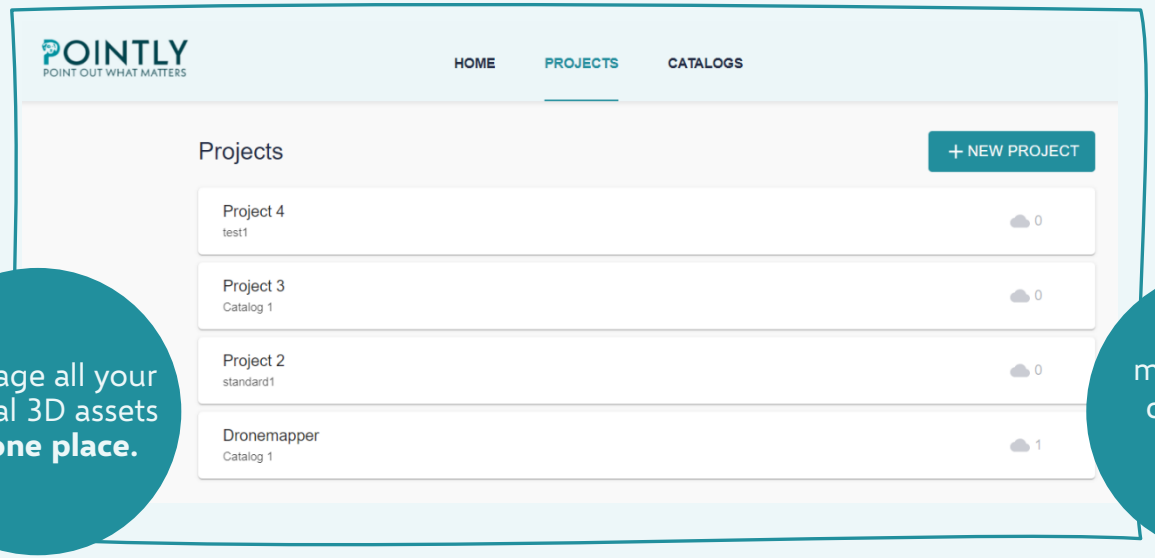
User-friendly interface
Simple navigation, no nested menus, an intuitive toolbox – it will feel like you always worked with Pointly.

Custom Label Catalogs
You can create unlimited custom classes to classify your point clouds.

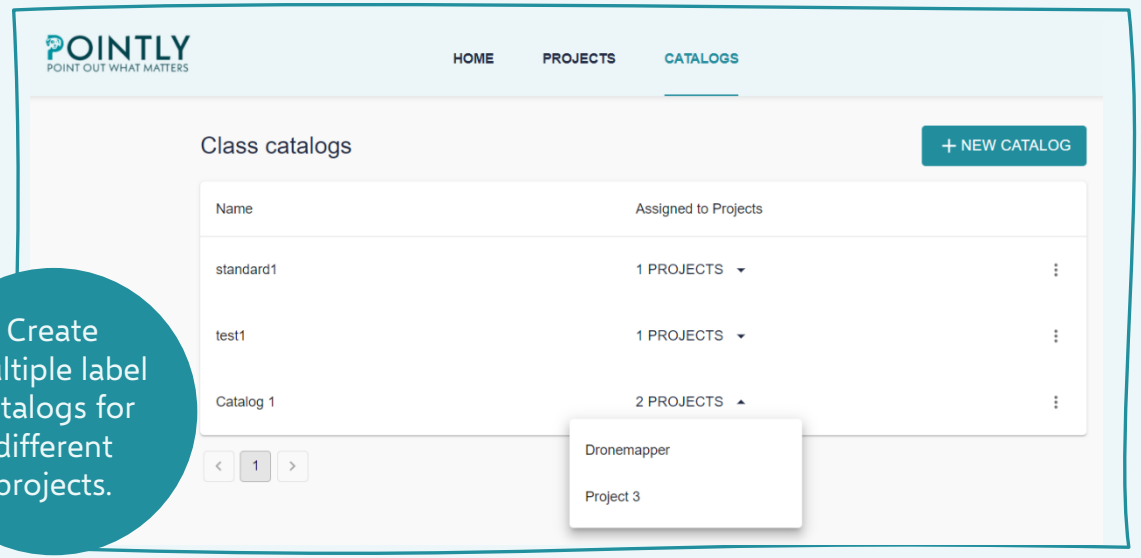
Process large data & point clouds
Through parallelized and scalable processing, Pointly easily manages even large amounts of data.

Leverage the power of the cloud
Sign up and get started – It's that simple!
Point out what matters right out of the box.

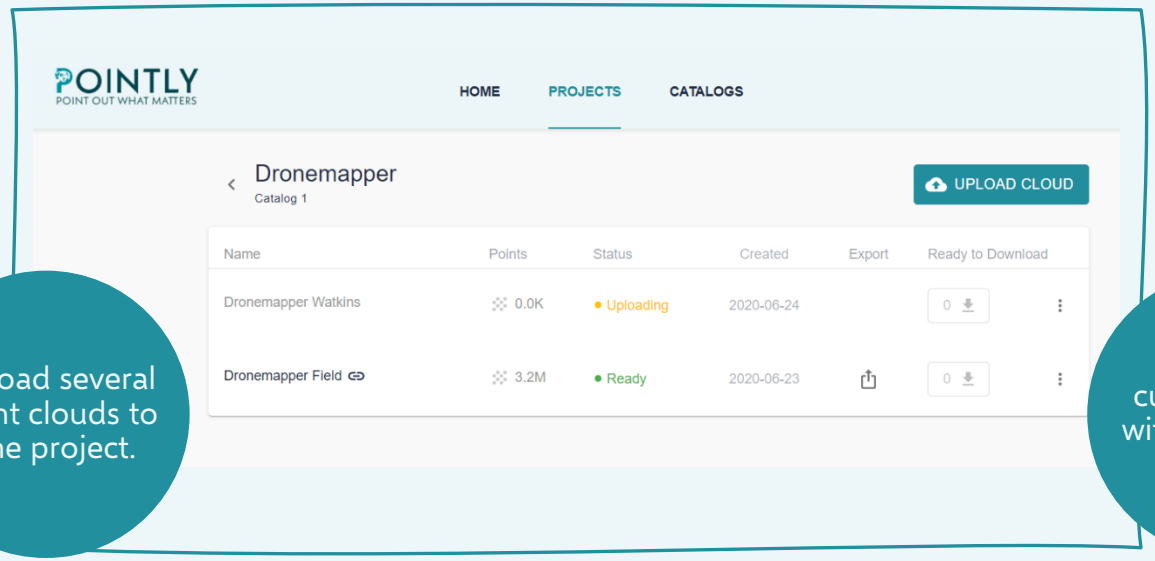
Pointly's 1.0 interface



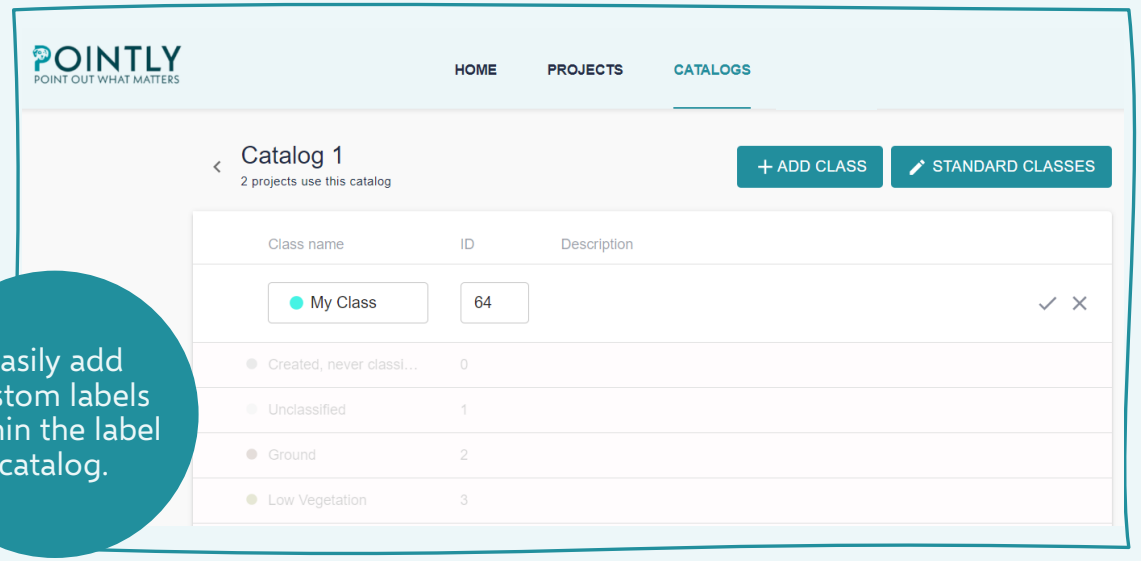
Manage all your digital 3D assets **in one place.**



Create multiple label catalogs for different projects.



Upload several point clouds to one project.



Easily add custom labels within the label catalog.

Pointly 2.0

What's coming in the future?

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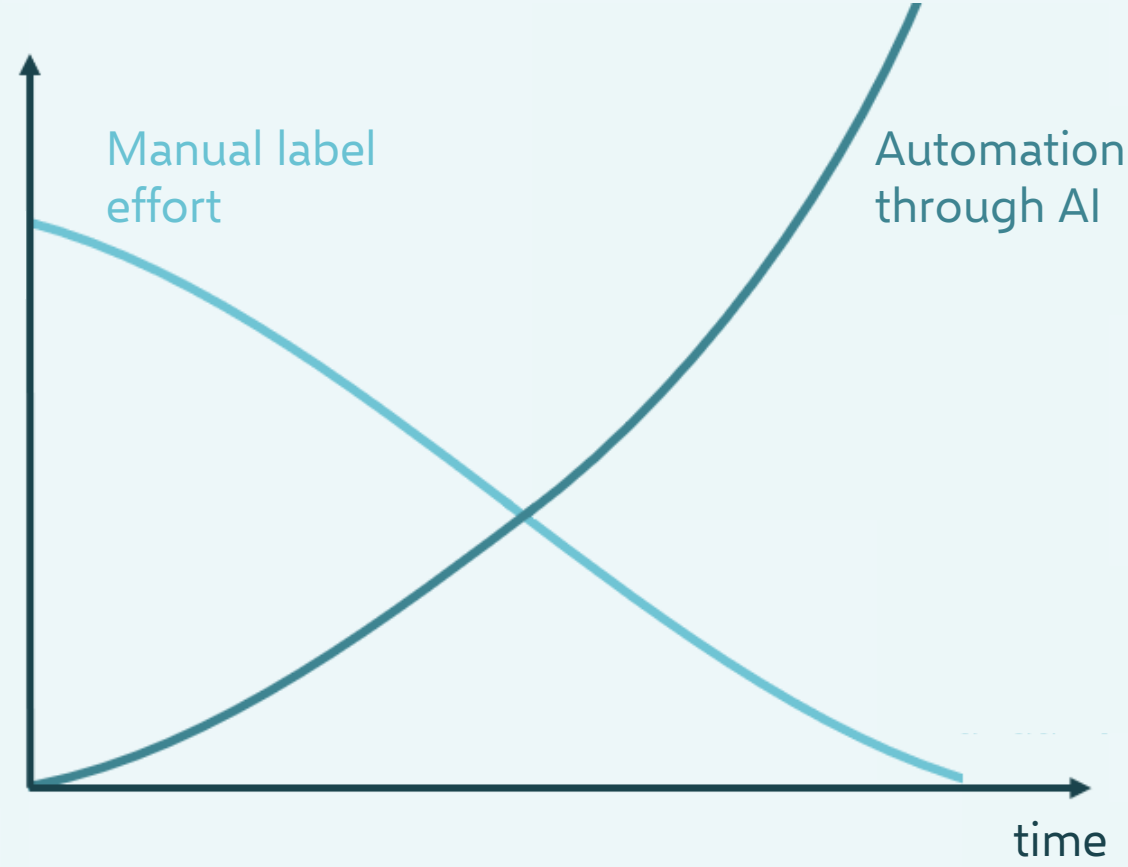
Pointly 2.0 Features

What's coming in the future?

Various standard detectors for automatic classifications

Custom self-learning neural networks

Automated conversion to common formats (e.g. Map Layer, CAD, BIM...)



Vision Pointly SaaS

Collaboration with your team

POINTLY

Custom 3D AI in one platform
for everyone

Interfaces to other platforms

Visualize
- Different views
- Reports

Classify
- Automated
- Manual correction
- Self-learning models

Analyze
- Volumes
- Comparisons
- Positions, ...

Convert
- CAD
- BIM
- Map Layer

Pointly Testimonials

VINCI

Modern surveying technologies (laser scanning, drone flights etc.) allow the recording of high-precision 3D point clouds from existing construction sites. With the help of this data and **by using Pointly, construction sites can be better organized** and processes can be monitored and improved."

Dr. Dirk Ebersbach
Managing Director at VIA IMC GmbH

RAG

[W]hat stands out the most to us is **Pointly's adaptability – the new approach can learn continuously**. Thus, any manual correction to the automatic classification (if necessary at all) improves the process for future applications."

Dipl.Ing. Andreas Schlienkamp
Group Leader Remote Sensing K-SG-NGF at RAG Aktiengesellschaft

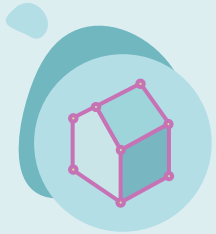
Pointly's 4 Key Benefits

3D Labeling Platform

Pointly is the only user-friendly 3D labeling platform for all point cloud types that enables customized Deep Learning.

Flexible and modular architecture

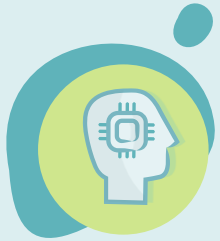
The architecture behind Pointly is flexible and modular. Thus, outdated algorithms can be easily replaced with new ones from latest AI researches on 3D point clouds. Hence, Pointly keeps its technological edge.



CAD data generation

Users can automatically generate CAD data directly from the point cloud

- Fast processing times of huge amounts of data
- Significant cost savings for the end customer (factor 10+X)



Individual neural networks

Each user can analyze on Pointly in a very user-friendly way exactly what only he is interested in, without having to have the slightest know-how in the field of artificial intelligence.

Available as Services – soon in Pointly

Pointly (SaaS)

Pricing

POINTLY

Pointly – Subscriptions

Payment Period

- Monthly
- Quarterly **7.5%** Discount
- Yearly **15%** Discount

Professional S	Professional M	Professional L
€ 65 Per month	€ 320 Per month	€ 1580 Per month
✓ All Pointly Features ✓ Unlimited Projects ✓ **1,000 MPoints** Storage equals ~ 25 GB LAS	✓ All Pointly Features ✓ Unlimited Projects ✓ **6,000 MPoints** Storage equals ~ 150 GB LAS	✓ All Pointly Features ✓ Unlimited Projects ✓ **40,000 MPoints** Storage equals ~ 1 TB LAS
Get Professional S	**Get Professional M**	**Get Professional L**

- Prices excl. taxes
- **Monthly** cancellation period
- 1 MPoint = 1,000,000 points
- 1 GB point cloud in LAS format contains around 40 MPoints

Get started with a Free Account

3 Point Clouds (max 15 MPoints)
Exports are disabled

POINTLY

Pointly – Subscriptions

Payment Period

- Monthly
- Quarterly **7.5%** Discount
- Yearly **15%** Discount

Professional S	Professional M	Professional L
€ **60**	€ **295**	€ **1460**
Per month	Per month	Per month
180 € / 3 months	**885 €** / 3 months	**4,380 €** / 3 months
✓ All Pointly Features	✓ All Pointly Features	✓ All Pointly Features
✓ Unlimited Projects	✓ Unlimited Projects	✓ Unlimited Projects
✓ **1,000 MPoints** Storage	✓ **6,000 MPoints** Storage	✓ **40,000 MPoints** Storage
equals ~ 25 GB LAS	equals ~ 150 GB LAS	equals ~ 1 TB LAS
Get Professional S	**Get Professional M**	**Get Professional L**

Get started with a Free Account

3 Point Clouds (max 15 MPoints)
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POINTLY

Pointly – Subscriptions

Payment Period

- Monthly
- Quarterly **7.5%** Discount
- Yearly **15%** Discount

Professional S	Professional M	Professional L
€ **55**	€ **270**	€ **1340**
Per month	Per month	Per month
660 € / 12 months	**3,240 €** / 12 months	**16,080 €** / 12 months
✓ All Pointly Features	✓ All Pointly Features	✓ All Pointly Features
✓ Unlimited Projects	✓ Unlimited Projects	✓ Unlimited Projects
✓ **1,000 MPoints** Storage	✓ **6,000 MPoints** Storage	✓ **40,000 MPoints** Storage
equals ~ 25 GB LAS	equals ~ 150 GB LAS	equals ~ 1 TB LAS
Get Professional S	**Get Professional M**	**Get Professional L**

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3 Point Clouds (max 15 MPoints)
Exports are disabled

POINTLY

Pointly Services

- Overview
- Acquisition
- Labeling
- AI Training Service
- Detection
- Analysis
- Conversion

POINTLY

Pointly Services

What are Pointly Services?

Pointly Services are on-demand advanced 3D point cloud services, tailormade for you.

Pointly Services directly integrate with your manually classified point clouds on Pointly. This allows you to use them as training data for automated classification.

Pointly Services provide you an overview of what is possible with the technology developed by Supper & Supper. Services can be combined into powerful data pipelines and can be tailored to fit your individual use-case.

If you have a custom use-case in mind reach out to us for a tailored solution that fits your needs.

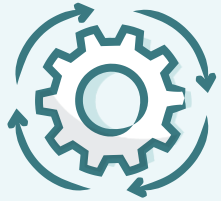
Pointly Services Overview

Acquisition

In cooperation with our Partner Network, we offer data acquisition as the first step in an end-to-end pipeline.

Labeling

Inquire a professional labelling workforce via one of our Labeling Service Providers.



AI Training

Receive your own specific AI model, that enables automated and continuously improving point cloud classification.

Detection

Automatically classify point clouds and detect object instances with powerful 3D AI algorithms.

Analysis

Unlock insights regarding distances, volumes, types and more through automated pipelines.

Conversion

Receive outputs in the formats that work best for you, for example map layers or CAD models.

Pointly Services

Acquisition & Labeling

Acquisition Services

Point Cloud Generation

Order LiDAR and imagery-based scans of your physical assets anywhere in the world and process the data directly through Pointly's intelligent labeling tools and services.

Photogrammetry Processing

Do you use drone images to capture your assets and would like to turn them into point clouds? In cooperation with our drone flight and photogrammetry partner we can offer you a fast point cloud generation pipeline.

Post-Processing

Do you have already point clouds but would like to improve their data quality? With our cloud powered processing pipelines we offer denoising, registration, and filtering for large amounts of point cloud data.

Labeling Services

Do you need large amounts of point cloud data manually classified but would prefer to hire someone for the job?

In collaboration with our Labeling Service Providers, we provide access to a scalable and professional workforce that allows you to flexibly order labeling tasks.

Since the work will be done with Pointly's intelligent selection tools, you will see results much faster!

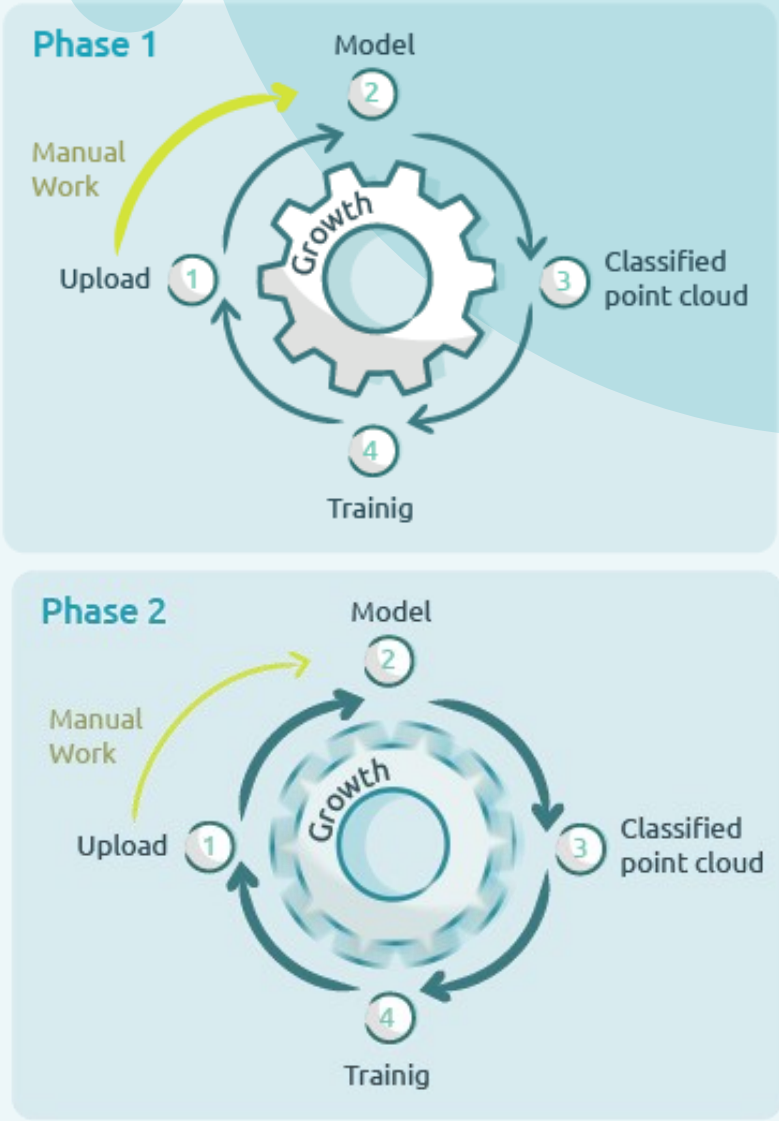
Pointly Services

AI Training

With this Service we offer you the possibility to not only benefit from automated classifications but also from tailor-made neural networks, specifically for your Use Case.

Like this your data quality improves with immense time savings over manual annotation, as your AI model learns every time your point clouds are classified. When the model takes over, the automation increases.

Do the manual work a few times and then rarely ever again.



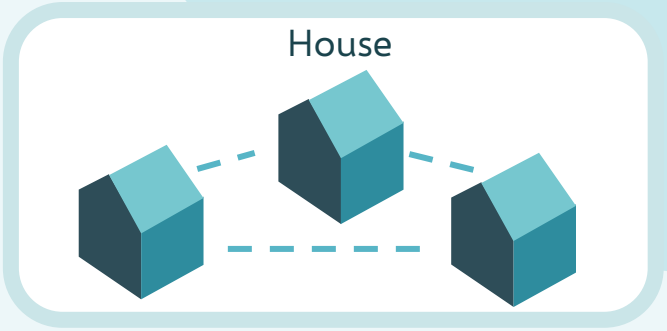
Pointly Services

Detection

Automatic Point Cloud Classification

Do you need your point clouds to be enriched with point classification information?
Pointly Services gives you access to unsupervised and supervised classification algorithms, including the most recent 3D neural networks.

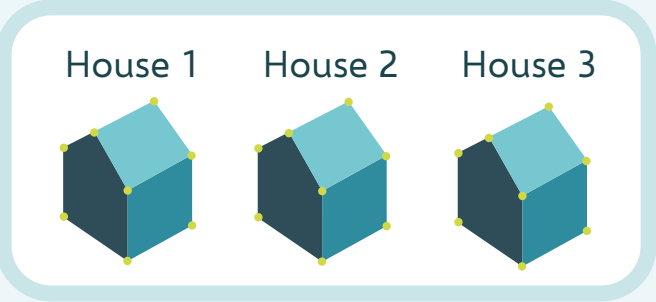
If you already started manually classifying your point clouds with Pointly's intelligent selection tools, you can leverage this as training data for our supervised classifiers.
This allows you to detect any custom object that can be labeled in your data.
A classified point cloud will allow you to filter for specific object classes and conduct further analyses.
If your use-case requires identifying single instances of an object class (e.g. trees or roofs) then our Automatic Instance Segmentation Service further increases the value of your data.



Every point that is a member of the "House" class can only be filtered with all other members of that class

Automatic Instance Segmentation

Instance segmentation builds on top of our AI-based classifiers to identify single instances of an object class. Rather then knowing which points belong to the "Tree" Class, you can then count and filter for individual trees and other objects. This allows you to conduct much more powerful analyses and disaggregate information on a per-object level.
Do you want to know more about what untapped information can be extracted from your point clouds? Have a look at our analysis services.



Every single instance can be addressed individually. You can list all houses and pick them individually rather than all or none.

Pointly Services

Analysis

Our Analysis Services can be combined with our Conversion Services depending on what output format you would like to receive the analysis in.

Aggregate Analysis

Building on our Automatic Point Cloud Classification Service you can quickly summarize and filter the information contained in your point clouds. This includes especially surface coverage and surface properties such as:

- Elevation (Ground and/or Surface)
- Height above Ground
- Footprints of Object Classes

Per-Object Analysis

Building on our Automatic Instance Segmentation Service it becomes possible to extract information from your point clouds at the level of single objects. This includes for example:

- Position
- Shape
- Length/Width/Height
- Area
- Volume
- Smallest Bounding Box
- Object type

Pointly Services

Conversion

Point clouds are only the start in an advanced 3D analysis pipeline. The outputs of our powerful detection services, whether aggregate or per object can be further refined into other data formats that tie right in with existing workflows. That is why we offer the following conversion services:

Raster data

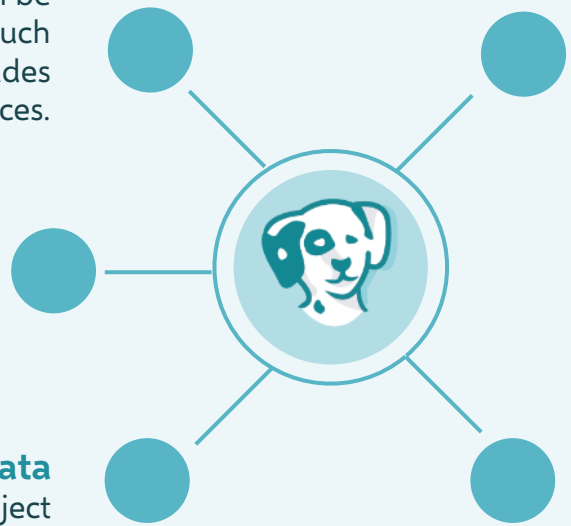
Surface properties such as elevation or type can be represented best as raster data, that is formats such as GeoTiff, GeoJson and more. This also includes aggregate statistics from our Analysis Services.

Vector data

Individual object footprints or positions are best represented as shape layers which you can then use in any GIS software. These formats also allow storing additional features from our Analysis Services as per-object attributes.

CAD data

Being able to detect individual instances of object classes down to single building components, we are happy to offer you automatic conversion services from point cloud data into CAD formats such as BIM models.



Tabular data

Do you prefer a straightforward summary of the objects in your point clouds? Based on our Instance Segmentation Service we can provide you with a detailed table of all individual objects, their types and any required additional attributes such as volume.

Other

Do you prefer pdf reports, an interactive dashboard or integration into a website? Contact us for custom inquiries and we make sure to get the valuable information from your point clouds to where it is needed.

Use Cases (Pointly Services)

POINTLY

Road Sign & Lamp Post Inventory

This Use Case is for you, if you:

- Have high resolution vehicle LiDAR
- Have 360° Images
- Need a map layer with position points for each individual road sign and lamp post

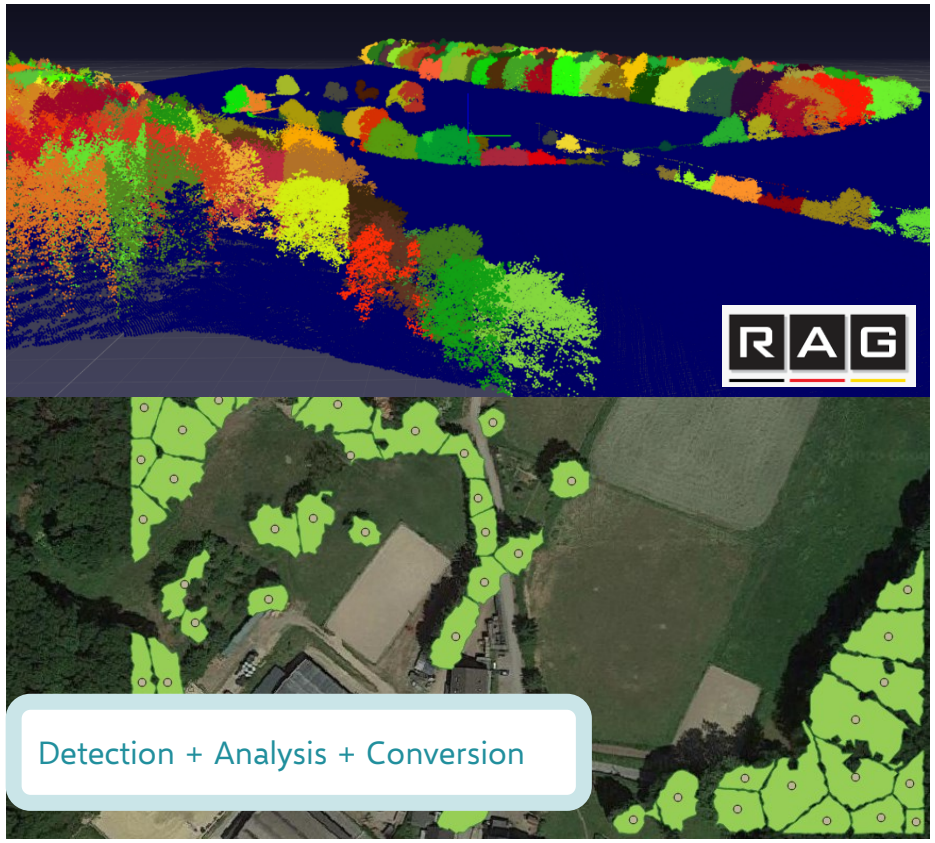
Our Approach:

We use our pretrained 3D network to classify all signs and lamps and then proceed with instance segmentation. Positions of road signs and lamp posts are recorded. Those positions are used to query 360° images and classify the sign type from images.

What you get:

You will get a map layer with sign and lamp post positions and sign type.

Tree Inventory



This Use Case is for you, if you:

- Have high-resolution aerial LiDAR
- Need a map layer with e.g. the position of points for each individual tree stump, including a polygon for approximate crown extent
- Want to have the height of each tree as an attribute in the map layer

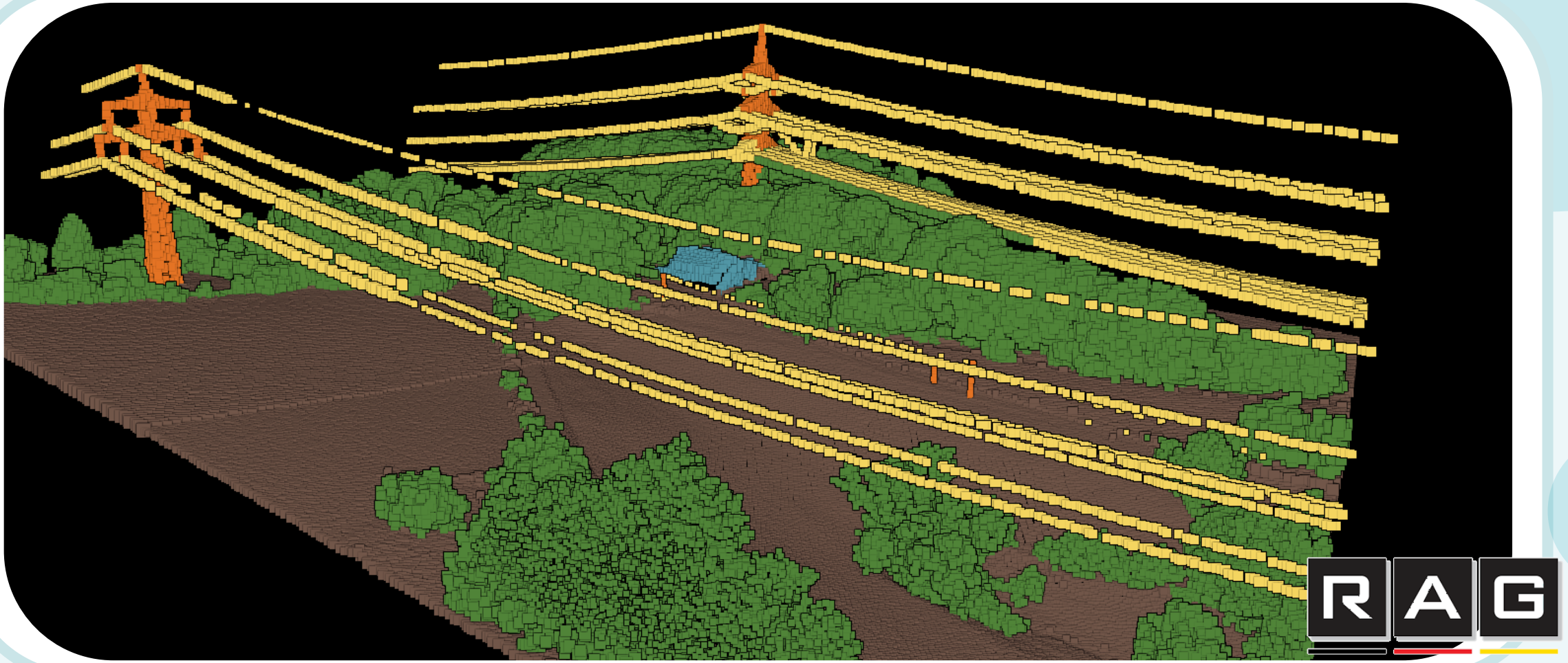
Our Approach:

We use our pretrained 3D network to classify all trees and proceed then with instance segmentation. Stump position points and height is determined for each tree segment. The crown extent is determined through 2D projection. We convert to .shp for both points and polygons (2 shapefiles), both enriched with height attributes.

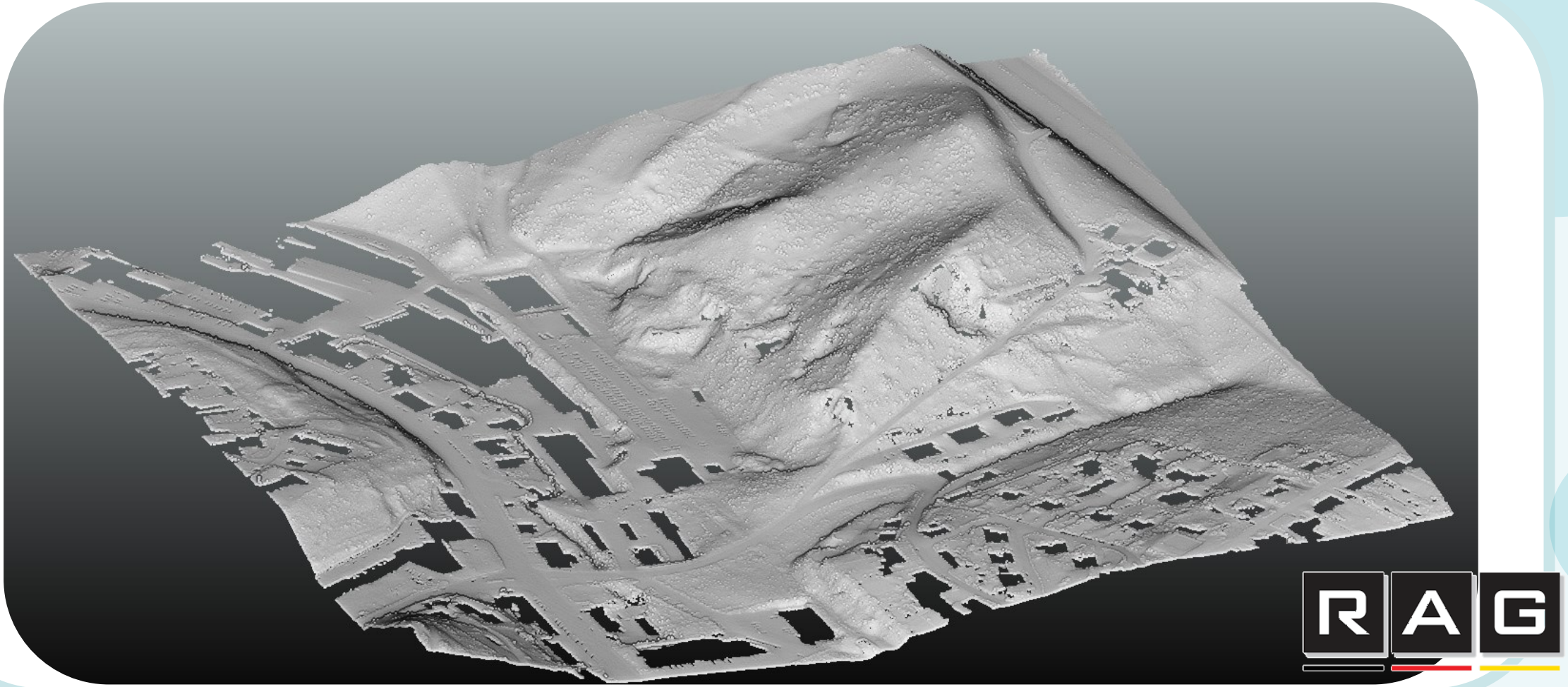
What you get:

2 Map layers (stump position points, crown extent polygons), each with height attributes

Automatic Classification of Power Lines

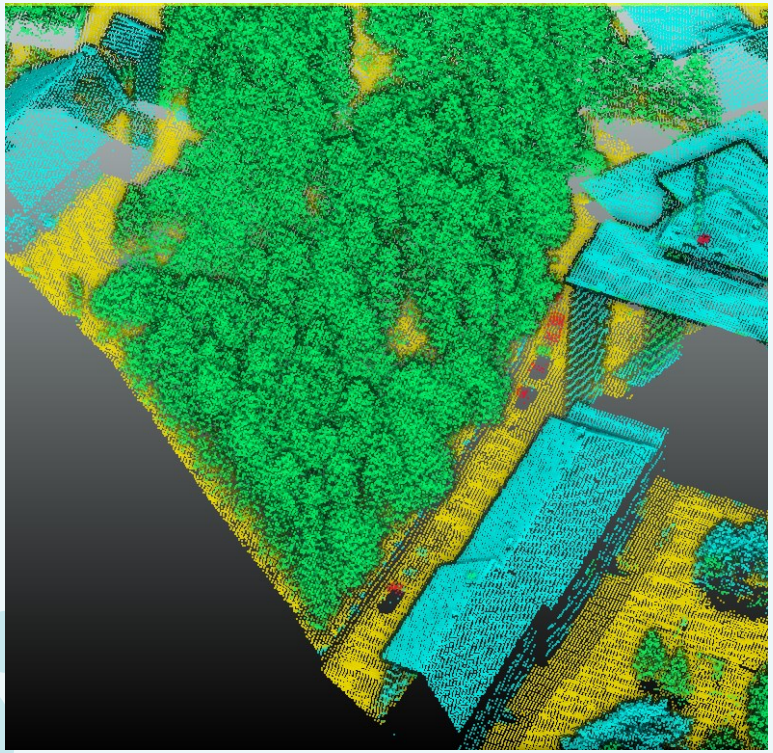


Automatic DEM (digital elevation model) extraction

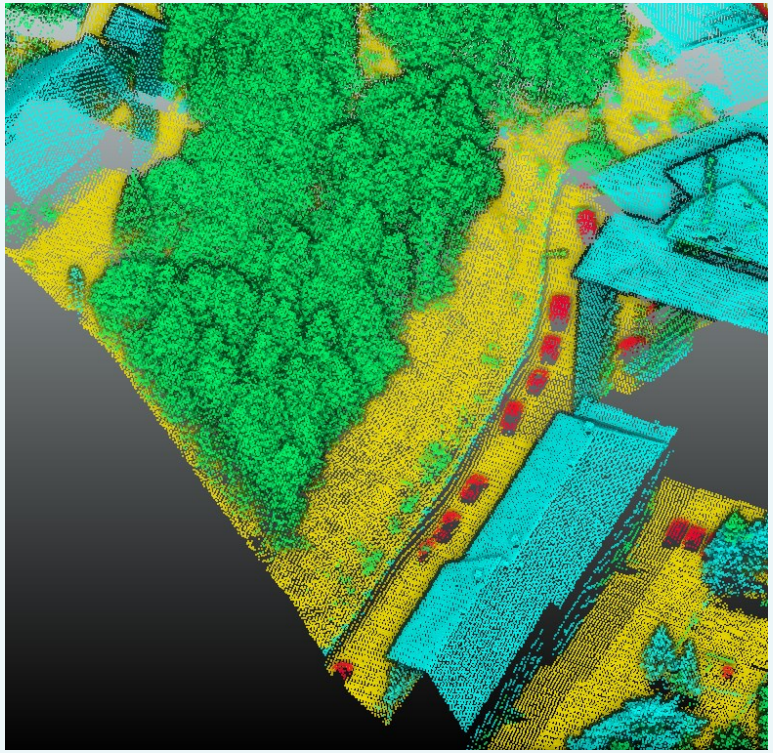


Vegetation Change Detection

2015

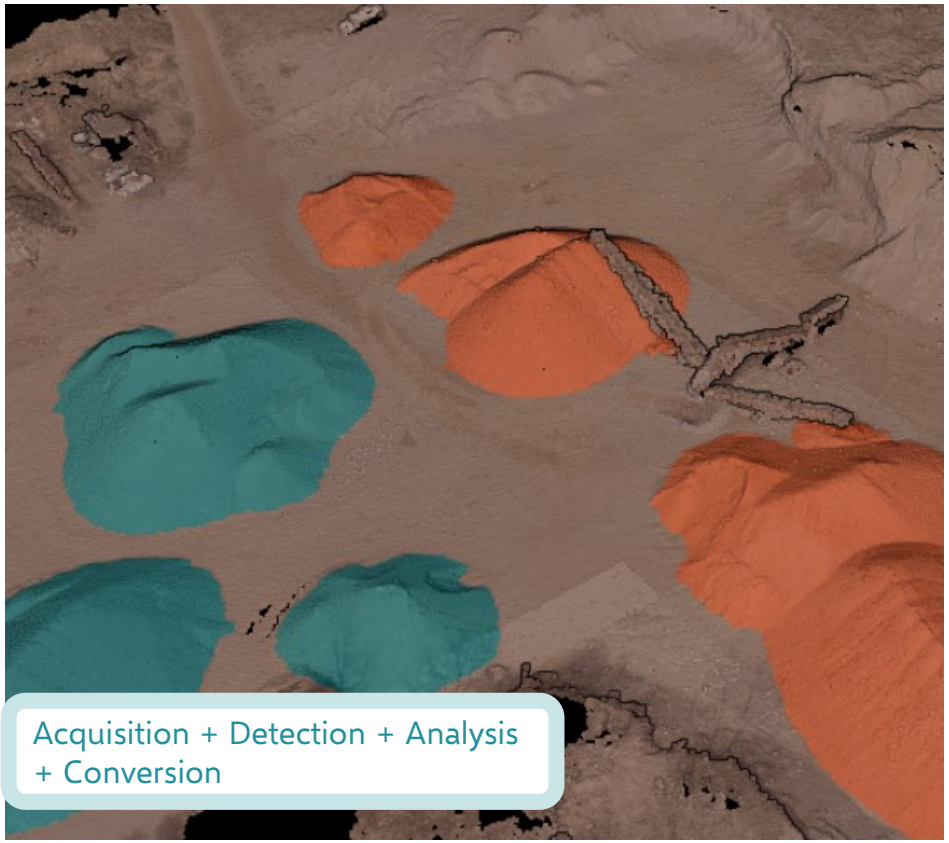


2016



Difference

Change Detection and DEM generation



Acquisition + Detection + Analysis + Conversion

This Use Case is for you, if you:

- Want to detect changes in elevation (e.g. erosion, mining, digging)
- Need to regularly update data in consistent manner
- Need a heatmap where most significant changes occurred in the last period

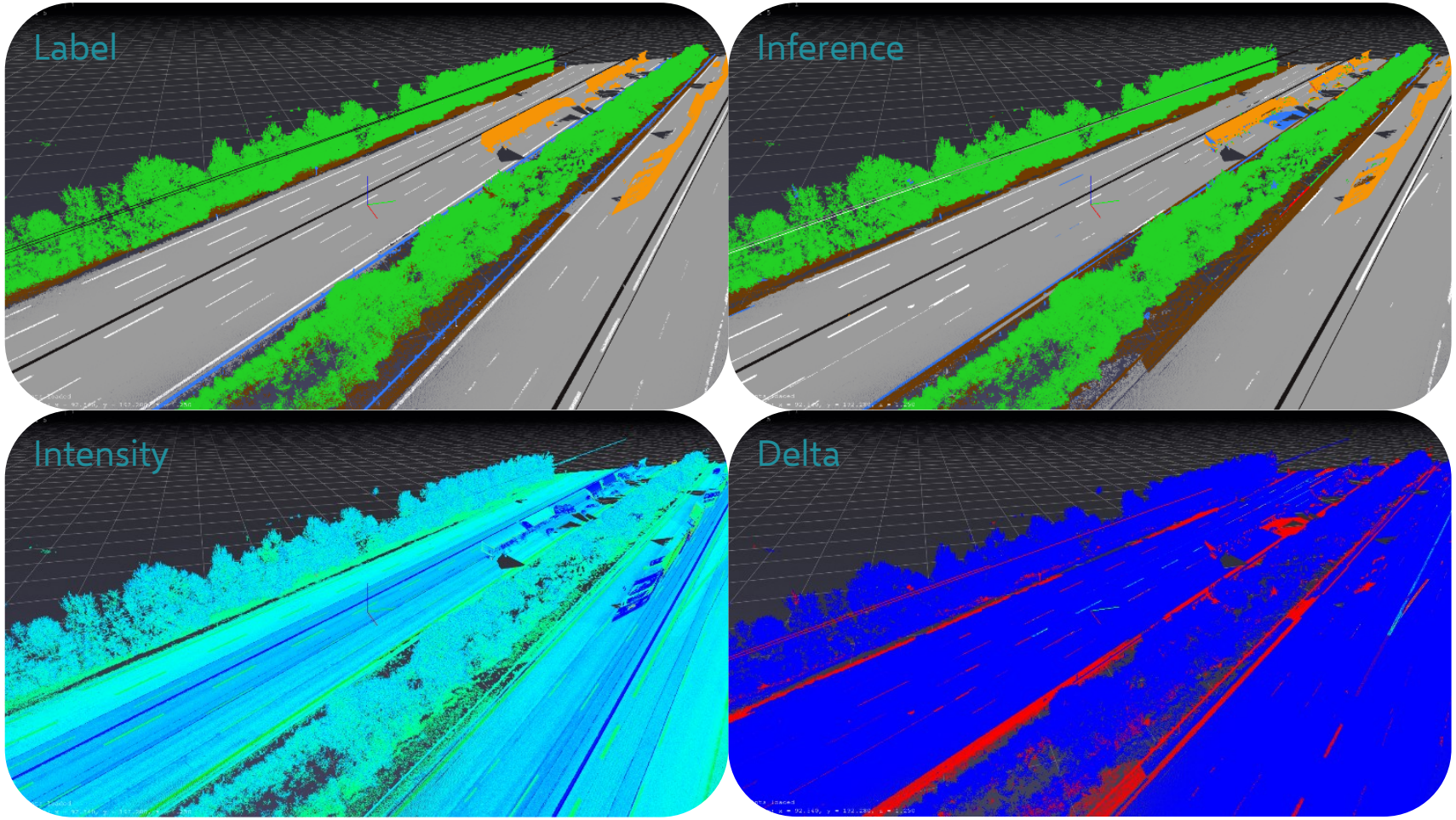
Our Approach:

We order and schedule regular drone flights of your site through our partner network. Then we accurately detect the ground in point clouds and compare it with previous scan. In addition, we also detect other movable objects to exclude false detections.

What you get:

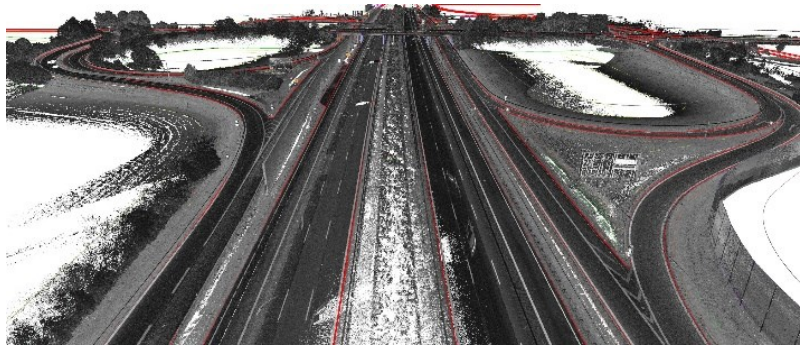
Export of significant changes as raster heatmap together with report for specific sites of interest

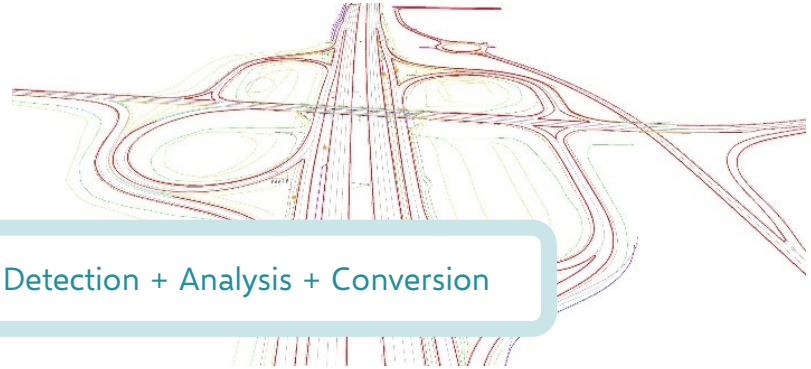
Automatic classification of highways



Road Mapping

cloud-vermessung.de + Planung GmbH





Detection + Analysis + Conversion

This Use Case is for you, if you:

- Have high resolution vehicle LiDAR
- Have 360° Images
- Need a map layer with outlines for road surface including street markings and guide rails

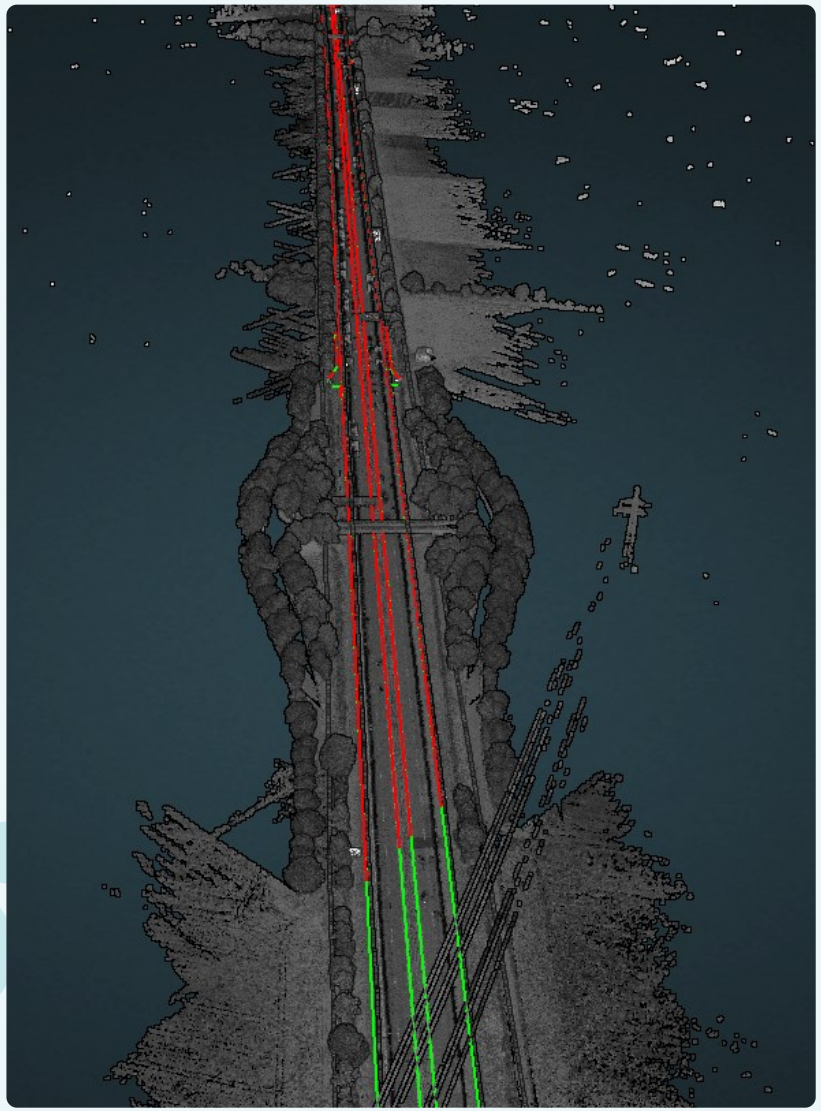
Our Approach:

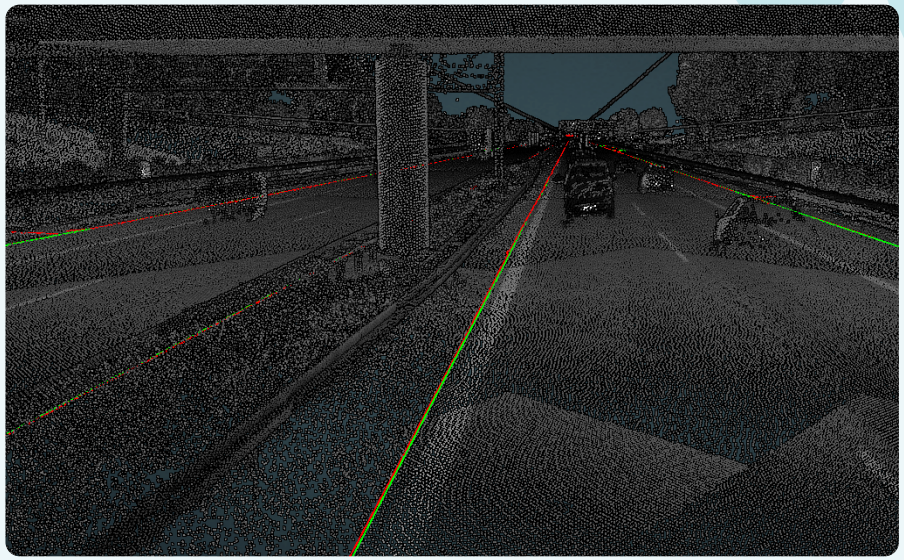
We use our pretrained 3D network to detect curbs and break lines in LiDAR Scans. In addition we use our pretrained image network to classify different surface categories, like road or sidewalk. Furthermore, information is joined into vectors for roads, curbs, and sidewalks.

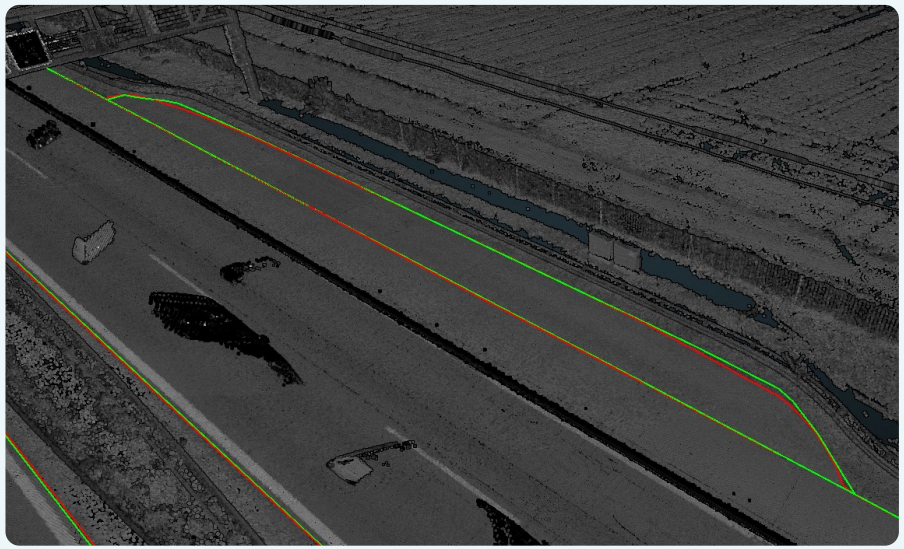
What you get:

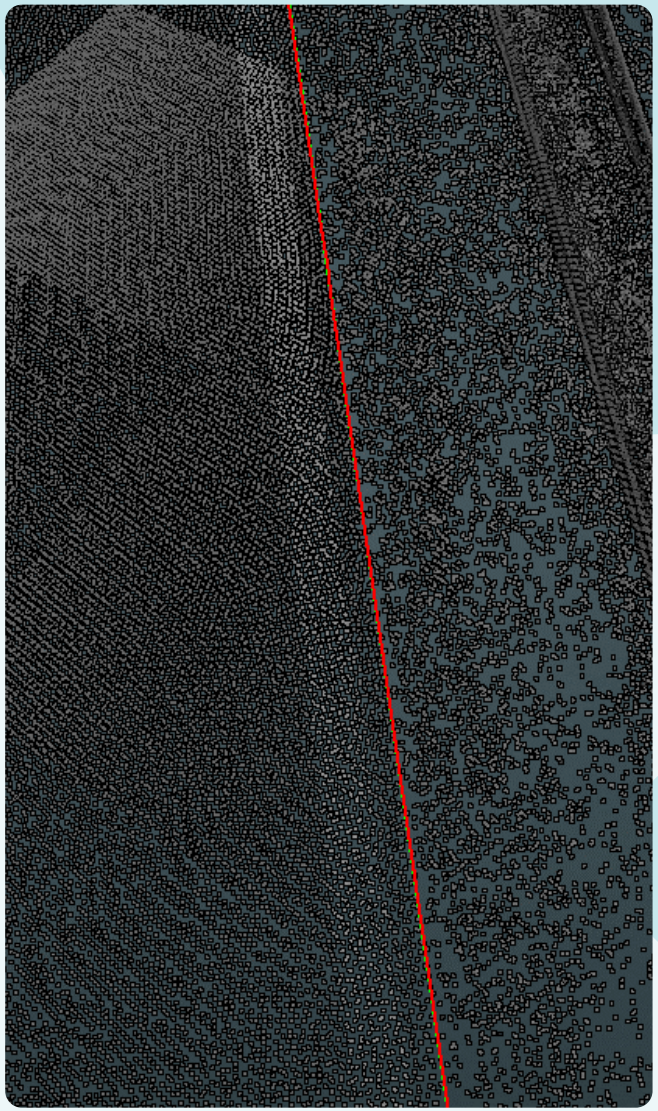
Map layer with road, curb, and sidewalk areas

Deep Learning on Vector Lines of Highway Scans



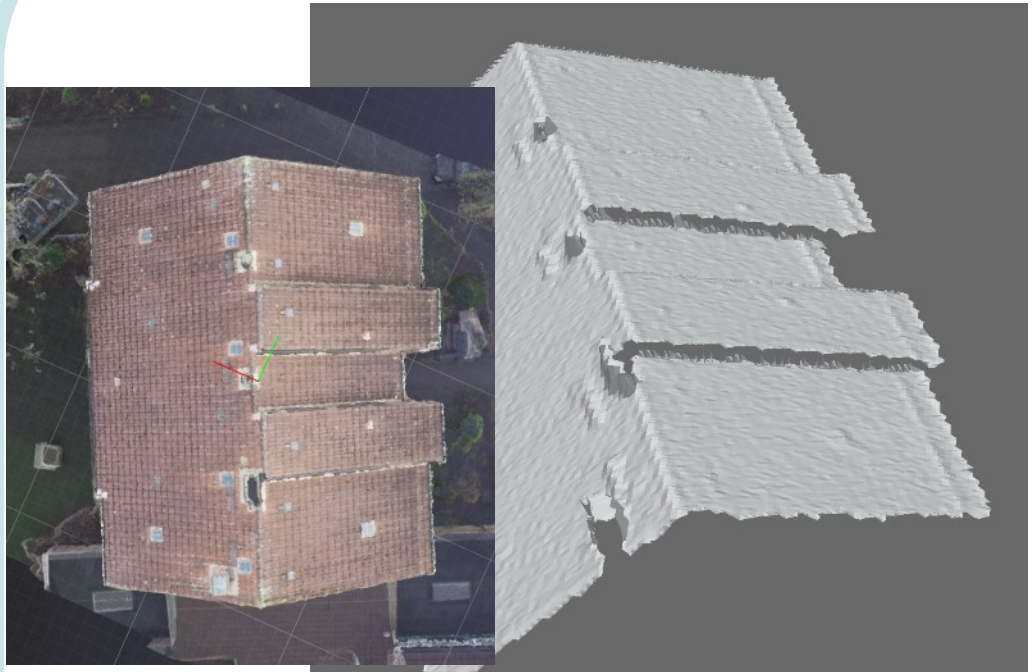






Red = Model Prediction
Green = Ground Truth

Building Modeling with Roof & Wall Surface Analysis



Labeling + Detection + Analysis + Conversion

This Use Case is for you, if you:

- Have photogrammetric point clouds of buildings
- Want to have BIM Model with additional information on roof and wall surface

Our Approach:

We take your order for the labeling of buildings, separated by walls and roofs and forward it to our labeling service provider.
Afterwards we will classify all walls and roofs as well as conduct an instance segmentation for all components.
We approximate all detected shapes with geometric primitives, described in cad format. This allows calculating and summing areas.

What you get:

CAD file with building model in LOD2 (building shape and roof shape) with added area attributes for roofs and walls

Image source: https://filipbiljecki.com/code/img/R3-refinedLODs.png

Contact details.

Stefanie Supper

CEO & Founder

0049 170 31 49 223

stefanie@supperundsupper.com

Sid Hinrichs

Head of Consulting

0049 174 306 1844

sid.hinrichs@pointly.ai

Francie Kastl

Business Development Manager

0049 175 85 718 41

francie.kastl@pointly.ai

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