



# UAV data processing and results

*«Latvijasmernieks.lv» Ltd.  
Part of Reaalprojekt Group*

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# About company

**SIA „Latvijasmernieks.lv“** – leading land surveying company in Latvia.

Founded in 2005 by Latvian state, calling «Latvian State Surveyor» (Latvijas valsts mērnieks). Was privatized in 2012, since then private company SIA Latvijasmernieks.lv, part of Reaalprojekt group.



# “Latvijasmernieks.lv” in numbers

- **17 offices;**
- **88 employees;**
- **67 certificates:**
  - cadastral surveying - 31;
  - geodetic works - 14 ;
  - land use planning – 21;
  - road design – 1.



# Our services

- **Geodetic works** – topography, cadastral surveying, construction site geodesy
- **Aerial photogrammetry using UAV-s**
- **Laser scanning** (in cooperation with Reaalprojekt)
- **Inspections of underwater constructions** (in cooperation with VRT Finland)
- **Road design**



# Aerial photogrammetry

Special measurements using modern unmanned aircraft. Acquired data can be used for topographical plans, 3D models and digital surfaces, orthophoto plans.



# Possible operation fields

- Remote sensing and photogrammetry;
- Forestry surveying;
- Mapping of vegetation;
- Precision agriculture;
- Identification of plants species;
- Mapping of coastal areas;
- Mapping shifts in sandbars;
- Surveying & mapping of landslides;
- Archaeological research;
- Mapping of industrial zones;
- Power line/cable inspections;
- Monument and bridge inspections;
- Wind turbine inspections;
- Internal waters monitoring;
- Surveying & mapping of flooding;
- Aerial photos.

# Octocopter of Latvijasmernieks.lv

- Vertical Take-Off and Landing
- Possibility of Hovering Operations
- Precision stabilization system for platform
- Stabilization system for payload module
- Composite materials



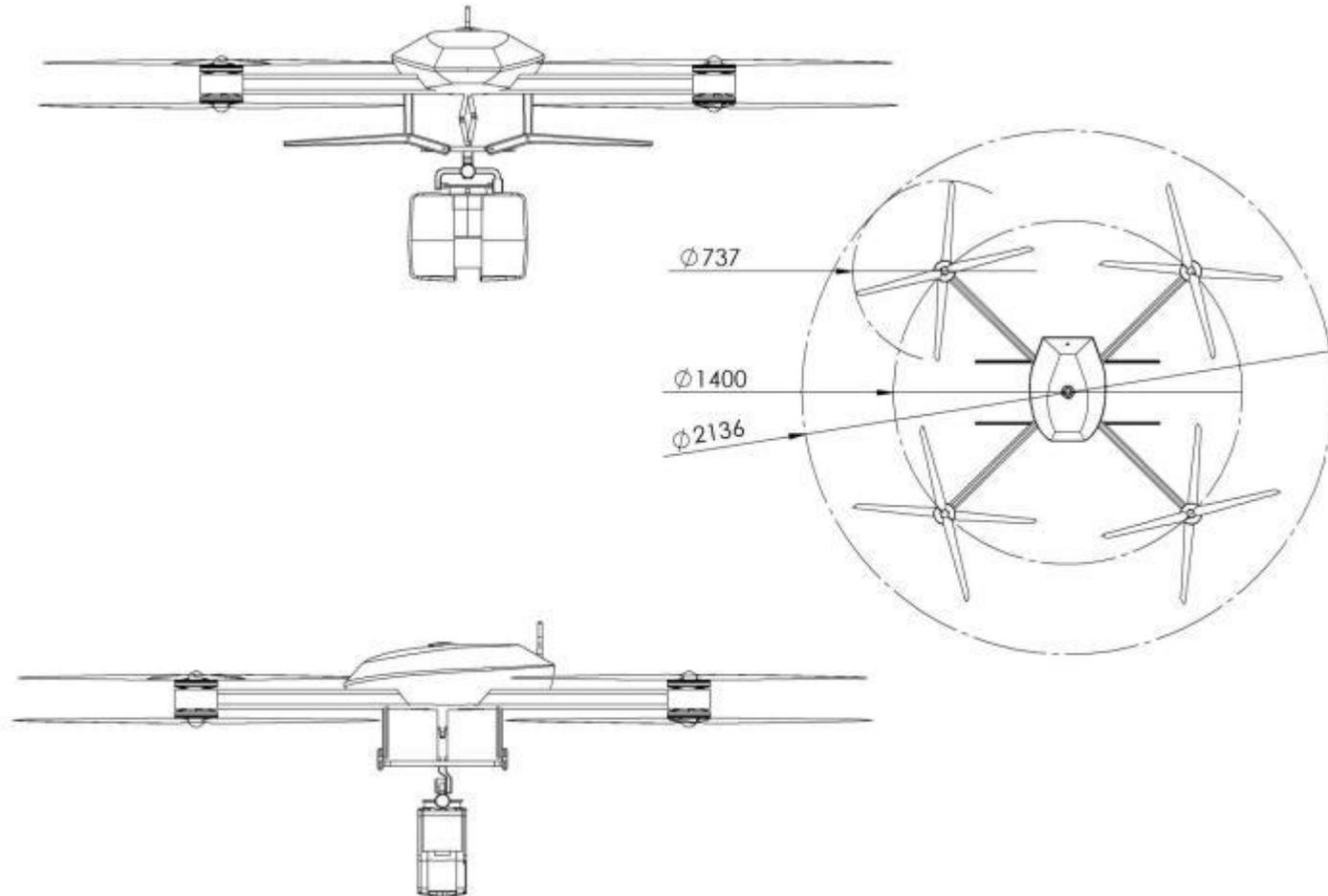
# Octocopter of Latvijasmernieks.lv

## Specifications

Max. take - off weight	25 kg
Max. payload weight	10 kg
Flight time ( with 7 kg)	30 min (depending on load/wind/battery)
Wind conditions	up to 9 m/s
Flying stabilization system	+/- 50 cm vert. axis
Max flying distance from control board	up to 3 km



# Octocopter geometry



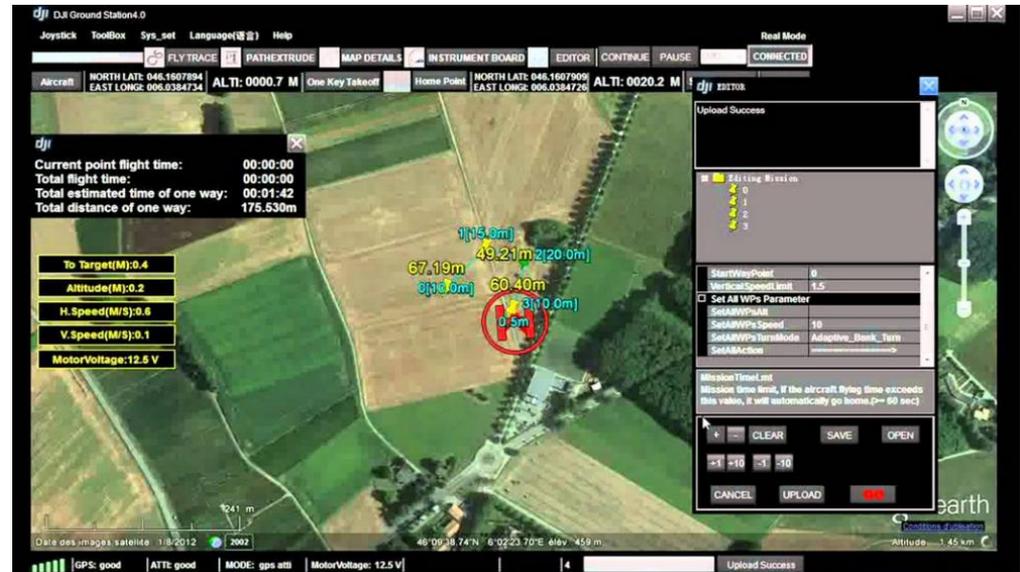
# Our work flow with UAV platform

- Planning
- Imaging
- Data processing
- 3D - processing
- Orthophoto

# Mission planning

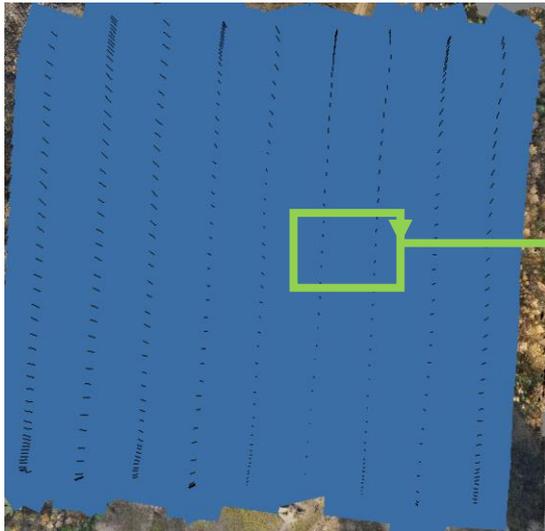
## DJI Ground Station 4.0 PC Ground Station Features

- Intuitive interface
- Google 3D maps
- Real-time flight monitoring
- Auto return home
- Click and go flight
- Auto takeoff and landing
- Customizable waypoints
- Editing Real-time flight route momentarily
- Photogrammetry tool
- Simulation
- Upload/download flight mission
- and more...<http://www.dji.com/product/pc-ground-station/feature>



# Imaging

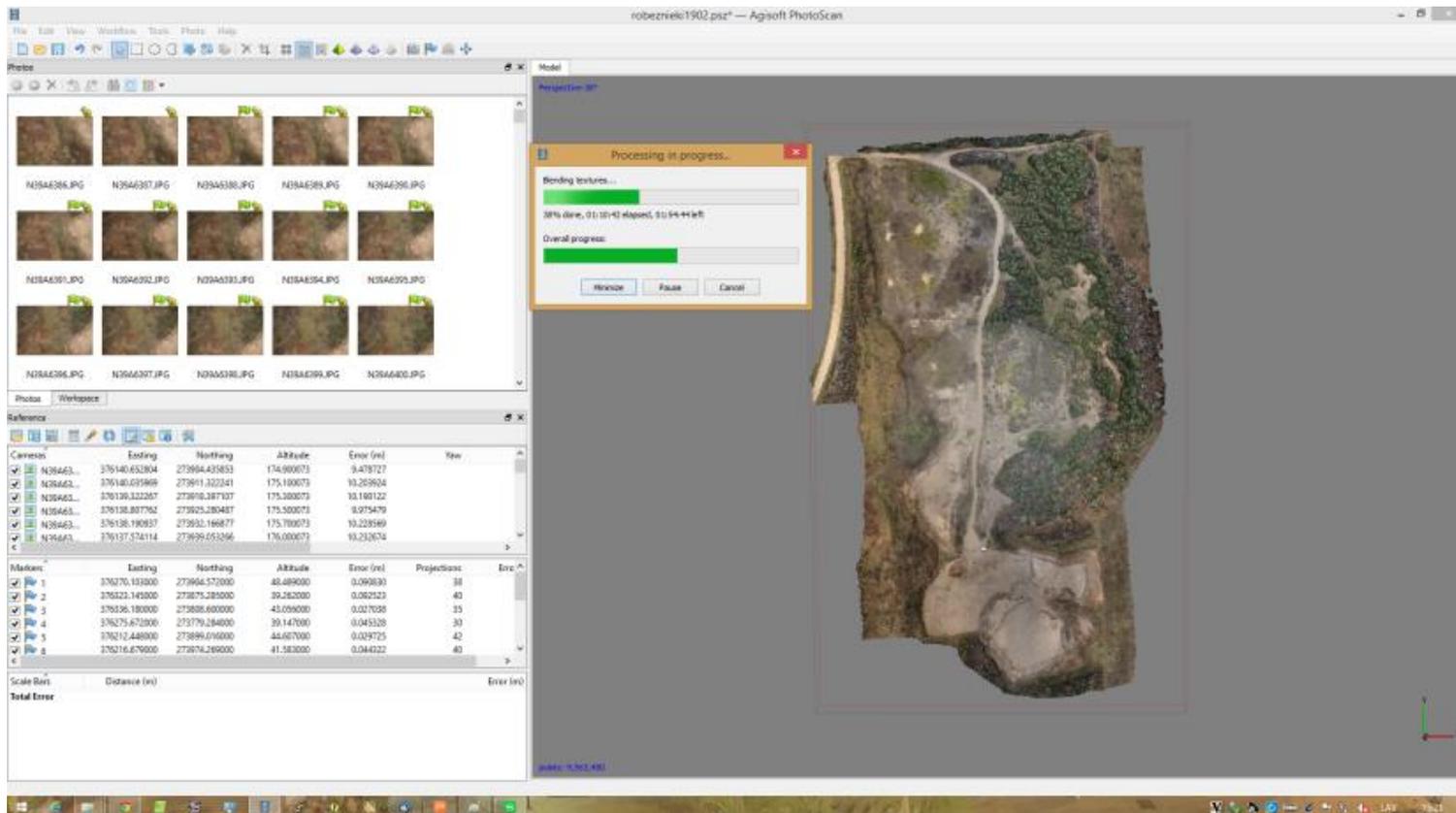
- Typical altitude 100 – 200 m
- Productivity ~10 ha/h
- Ground resolution 2 – 10 cm



# Data processing

- For photogrammetric processing of digital images and 3D spatial data generating we use Agisoft PhotoScan pro.

<http://www.agisoft.com>

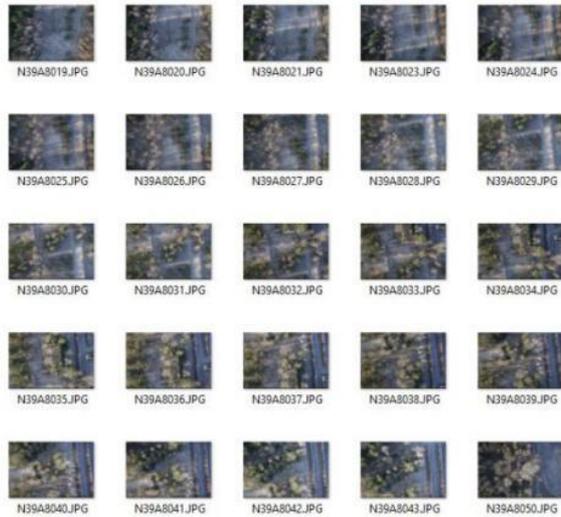


# Why Agisoft PhotoScan pro?

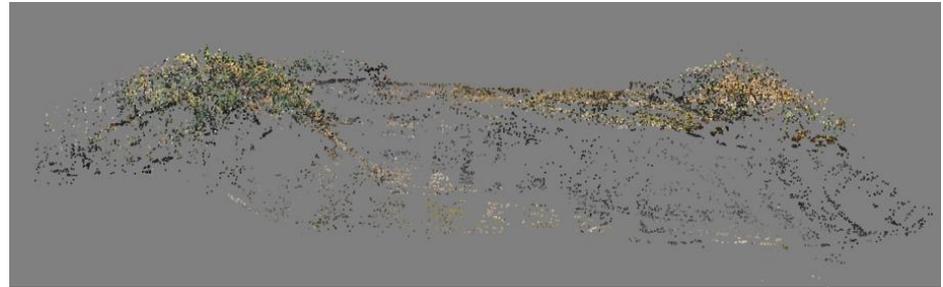
- experience
- good reviews
- user-friendly
- clustering mode
- optimal use of GPU

# Photo processing

Add photos



Align photos

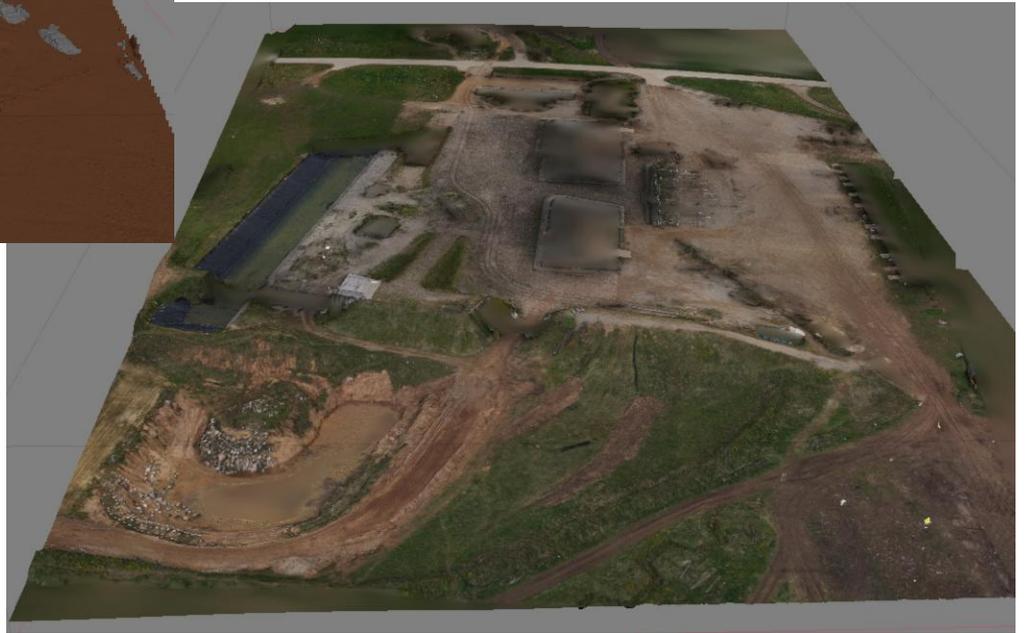
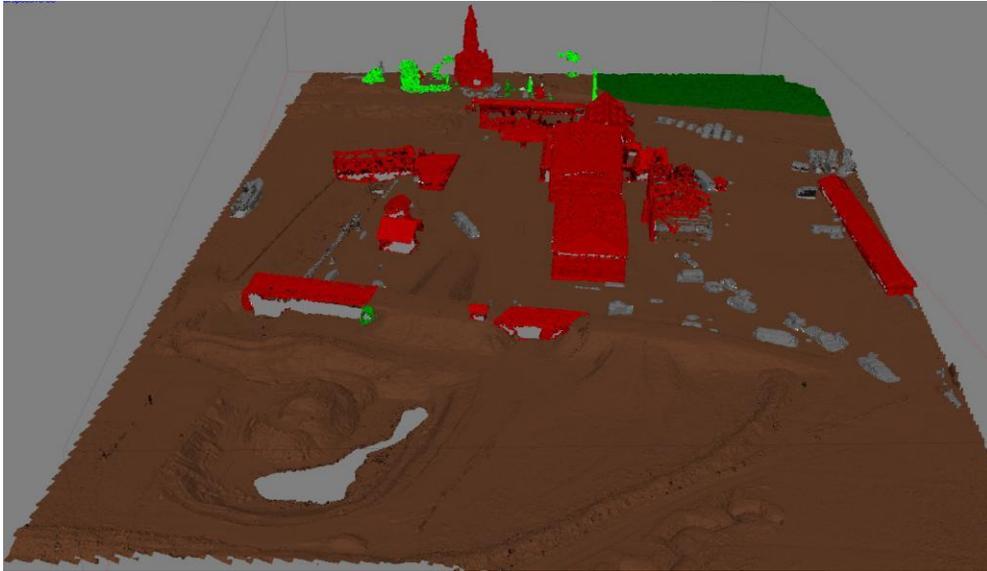


Build dense cloud



# Point classification

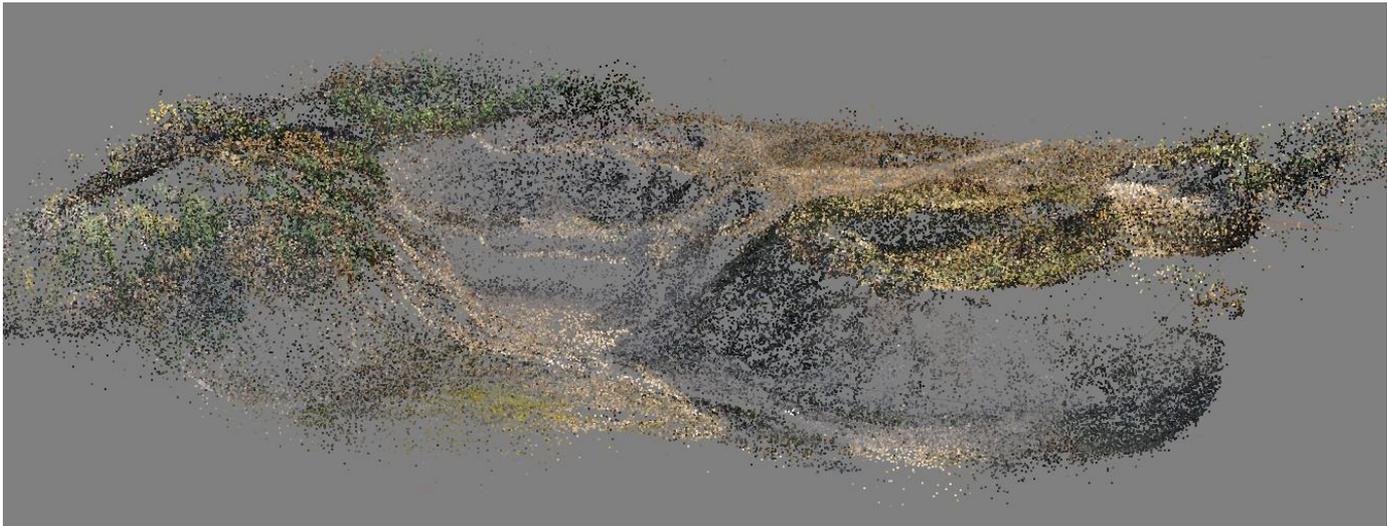
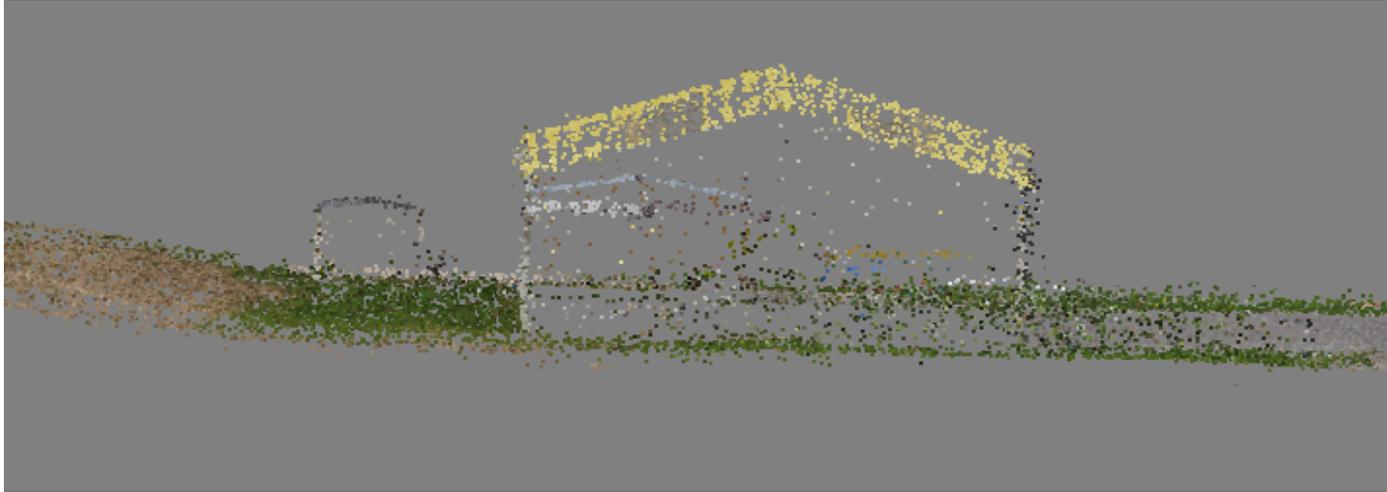
- Building
- Ground
- Vegetation
- Water
- Unclassified



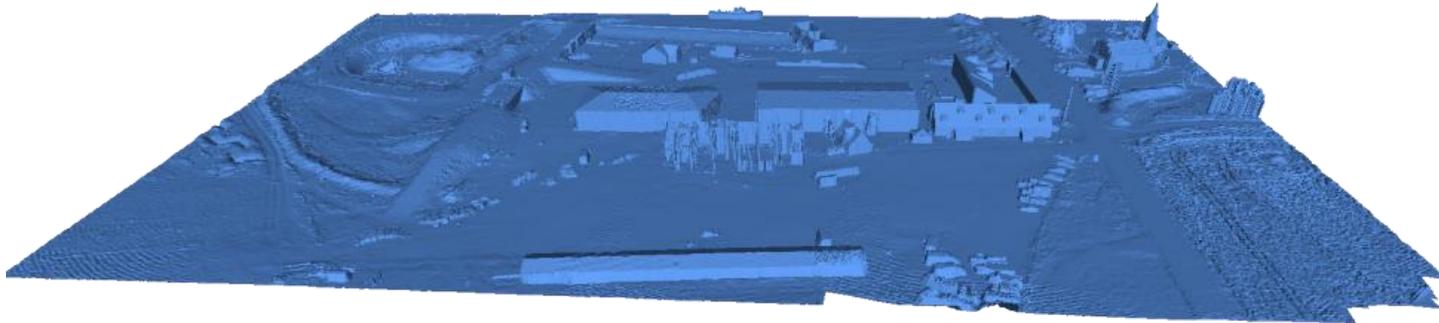
# 3D processing

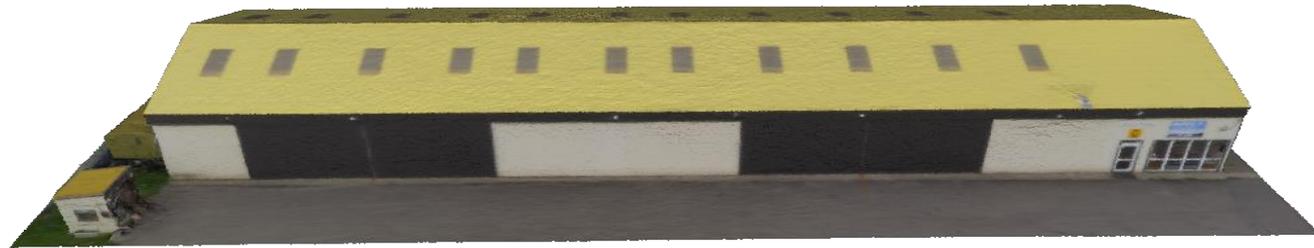
- Building models
- Topo maps
- 3D measurements
- Volumes

# 3D point clouds

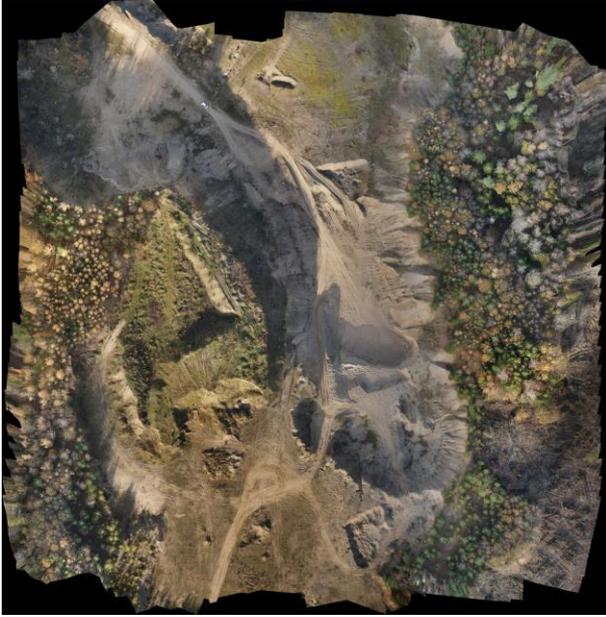


# Building models





# Orthophotos



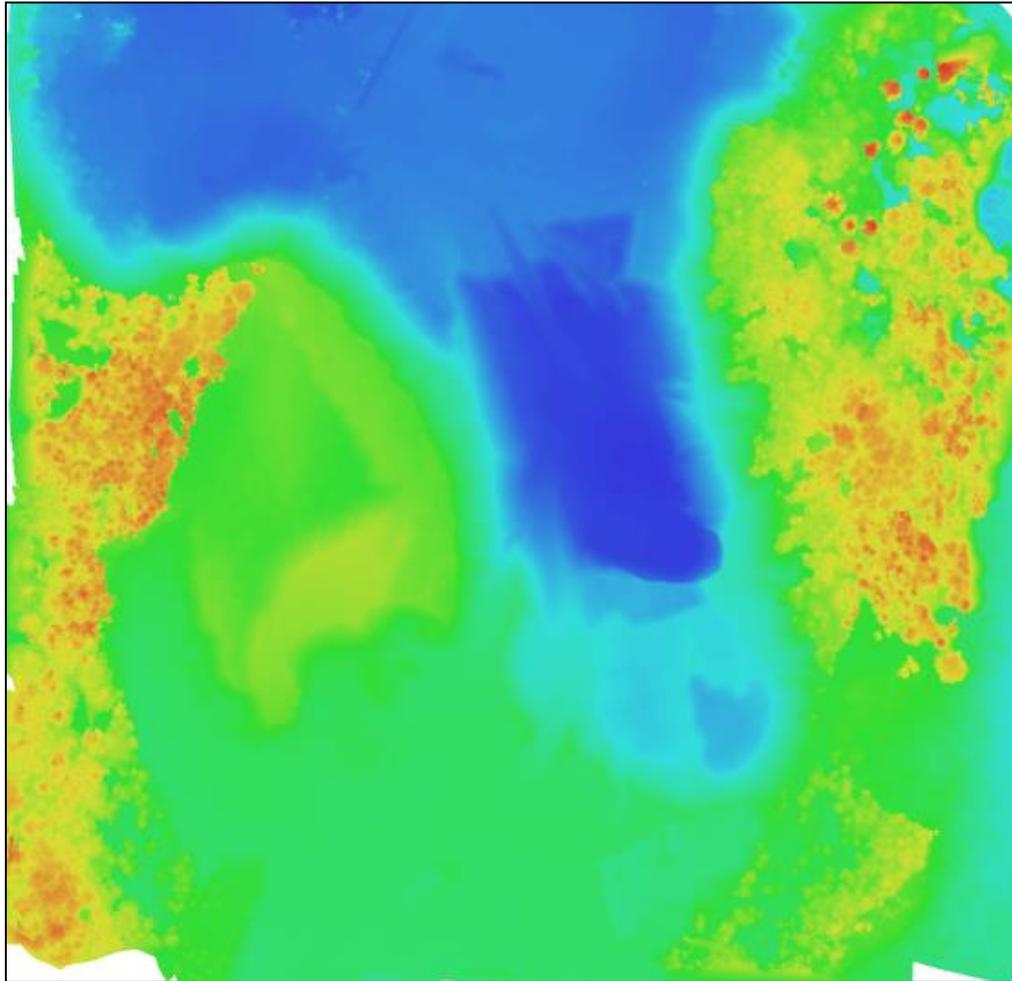
# Topo maps





# DEM

(Digital elevation model)



# DSM

(Digital surface model)



# DTM

(Digital terrain model)



# Time for one project

- Mission planning and imaging - normally 1 day
- Data processing
  - 3D model - 1,2 days
    - DEM, DTM, DSM
  - Orthophoto - 1 day

\* for areas up to 10 ha

# Why octocopter?

- **S**aving Costs
- **A**ble to avoid obstacles
- **F**lexible
- **E**ffective



# Thank you!

## Tuvāk zemei!



LATVIJASMERNIEKS.LV

**Reaalprojekt**

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