

Alteia

Alteia solutions for digital phenotyping



Digital Phenotyping

Screen more and faster

Score accurately

Measure new traits

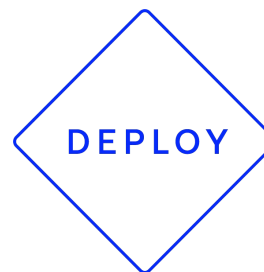
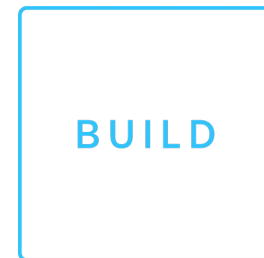
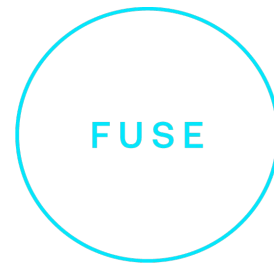
Precision Agriculture

Smart Plantation and Forestry

Digital phenotyping is now common in the breeding ecosystem.

The underlying challenge is how to integrate and scale this technology into your digital environment.

A **platform** to effectively
manage your data,
decisions, and
operations.



Enable Digital Twins,
a virtual representation
that serves as the
real-time digital
counterpart of physical
objects or processes.



SENSORS

DATABASES

MODELS

METHODS

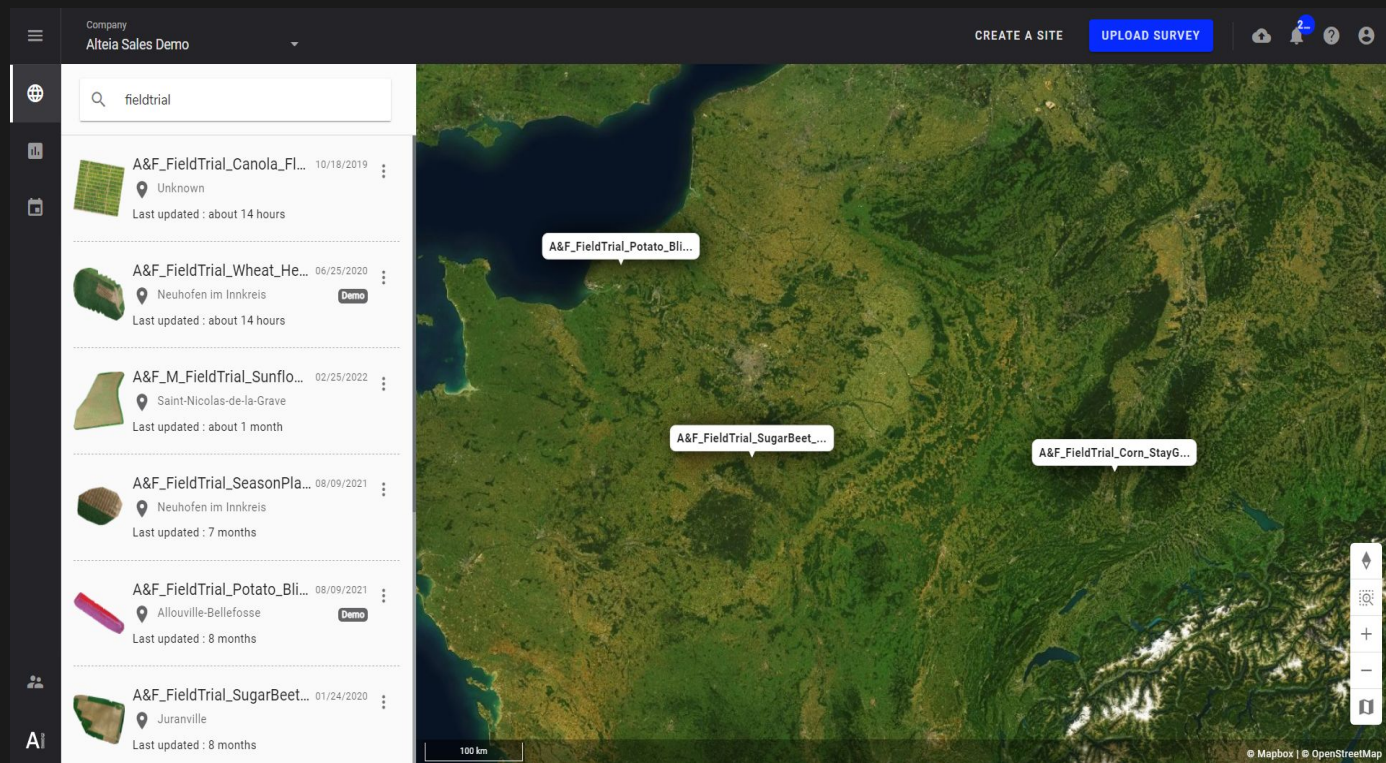
Web interface
White label

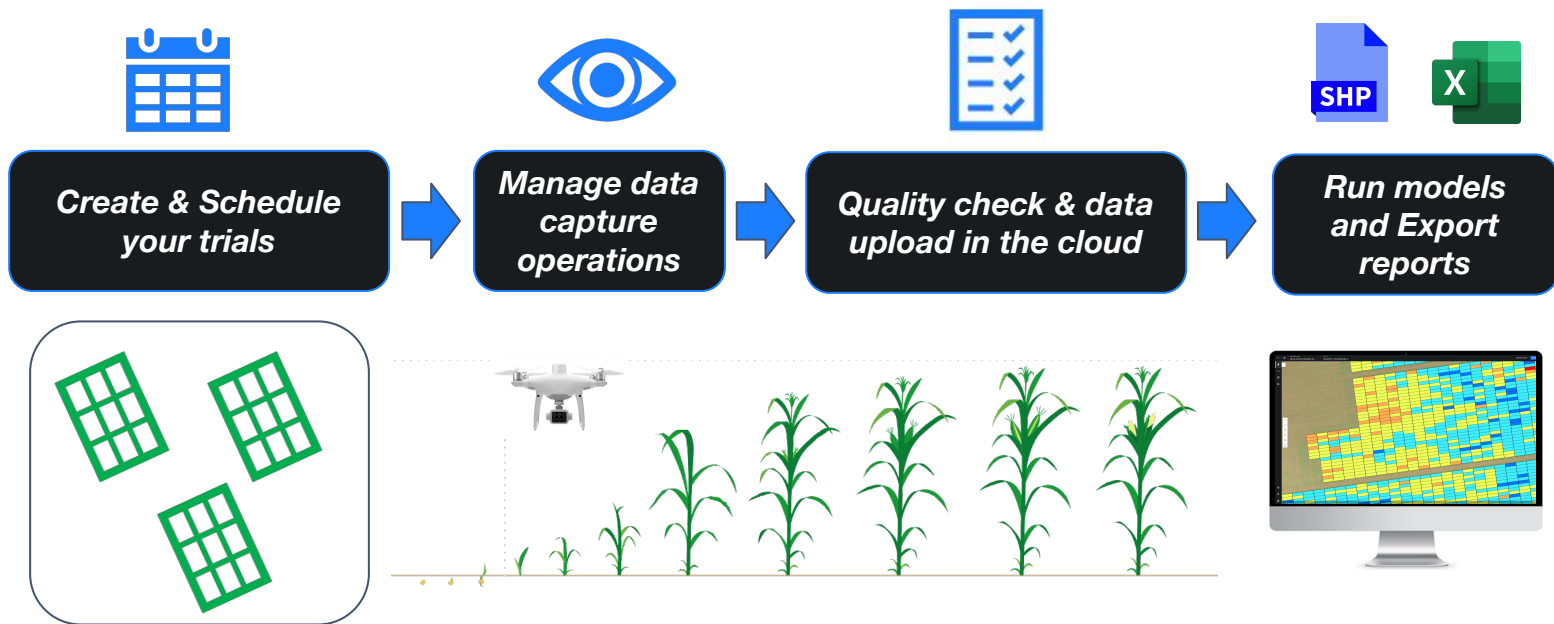
Specific business
modules and analytics

Automated workflows

APIs & SDK
Docker

Cloud or on-premise





Digital phenotyping: Manage the trials

☰

Season Planner

29

Trial dashboard

GENERATE CAPTURE TASKS PLOTS + NEW TRIAL MANAGE

FILTERS

Sort by name ▼

Search by name

▶ SORGHUM TRIAL

2021

Alteia - A&F - Internal
Sugar beet Field

1 capture tasks

PLOTS

SEE TASKS

+ ADD MISSION

⋮

▶ WHEAT TRIAL

2021

Alteia - A&F - Internal
Wheat Field

1 capture tasks

SEE TASKS

+ ADD MISSION

⋮

▶ CORN TRIAL_GE

2021

Alteia - A&F - Internal
Corn GE

1 capture tasks

SEE TASKS

+ ADD MISSION

⋮

▶ DEMO CANOLA

2021

Alteia - A&F - Internal
Canola Field FR

1 capture tasks

SEE TASKS

+ ADD MISSION

⋮

▶ CORN_GE_0.135

2021

Alteia - A&F - Internal
Corn GE

1 capture tasks

SEE TASKS

+ ADD MISSION

⋮

▶ CORN_GE_0.159

2021

Alteia - A&F - Internal
Corn GE

2 capture tasks

SEE TASKS

+ ADD MISSION

⋮

▼ CORN DEMO

2021

Alteia - A&F - Internal
Corn GE

2 capture tasks

SEE TASKS

+ ADD MISSION

⋮

▼ 04/25 - FLIGHT 2 - DEMO

1 AP estimations

FCOVER_Corn

— — Report generated

SEE TASK

START ANALYSIS

▼ 04/12 - FLIGHT 1 - DEMO

1 AP estimations

Corn_Plant count and emergence from multispectral_FW

— — Report generated

SEE TASK

START ANALYSIS

▶ DEMO LIDAR TRIAL

2021

Alteia - A&F - Internal
LIDAR Demo

1 capture tasks

PLOTS

SEE TASKS

+ ADD MISSION

⋮

Asset manager

TEAMS

PILOTS

CARRIERS

SENSORS

FILTERS

+ NEW CARRIER

MANAGE MODELS

Phantom 4 Pro - 098765

Out Of Service

⋮

Carrier model:

DJI - Phantom 4 Pro

Serial number:

098765

Firmware:

Owned by:

Alteia Ag Team

MATRICE M600 - 109876789

Ready

⋮

Carrier model:

DJI - MATRICE M600

Serial number:

109876789

Firmware:

0987678

Owned by:

Alteia Ag Team

UX11AG - 2339030

Ready

⋮

Carrier model:

Delair - UX11AG

Serial number:

2339030

Firmware:

33303030

Owned by:

Alteia Ag Team

Alteia Sales Demo

Survey

A&F_M_FieldTrial_Sunflower_Inve...

06/08/2016 - A&F_FieldTrial_Sunfl...

...

UPLOAD FILES

UPLOAD SURVEY

2

...

>

06/08/2016 - A&F_FieldTrial_SunflowerPhenotyping

All (4595)

Sort by date

⊖

⊕




Image 0000set_000_003...




Image 0000set_000_003...




Image 0000set_000_003...




Image 0000set_000_003...




Image 0000set_000_003...

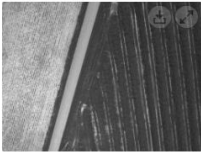


Image 0000set_000_005...

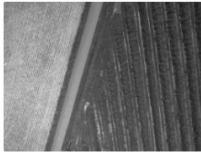


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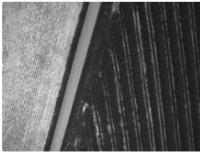


Image 0000set_000_005...

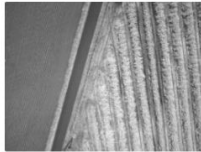


Image 0000set_000_005...

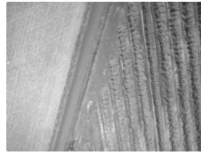


Image 0000set_000_005...

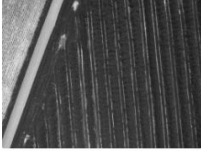


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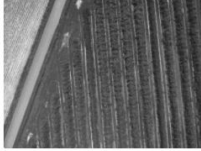


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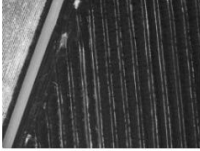


Image 0000set_000_005...

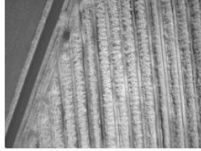


Image 0000set_000_005...

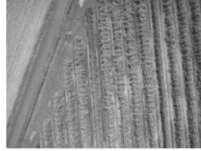


Image 0000set_000_005...

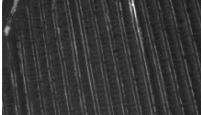


Image 0000set_000_005...

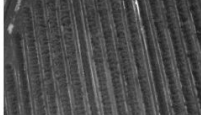


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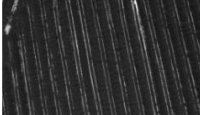


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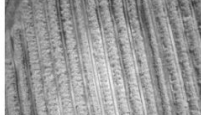


Image 0000set_000_005...

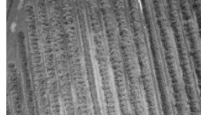


Image 0000set_000_005...

Flight

06/08/2016

PROPERTIES

COMMENTS

Add a tag...

INFO

Uploaded by

Number of photos

Quentin Vigneron

4595

CAMERAS

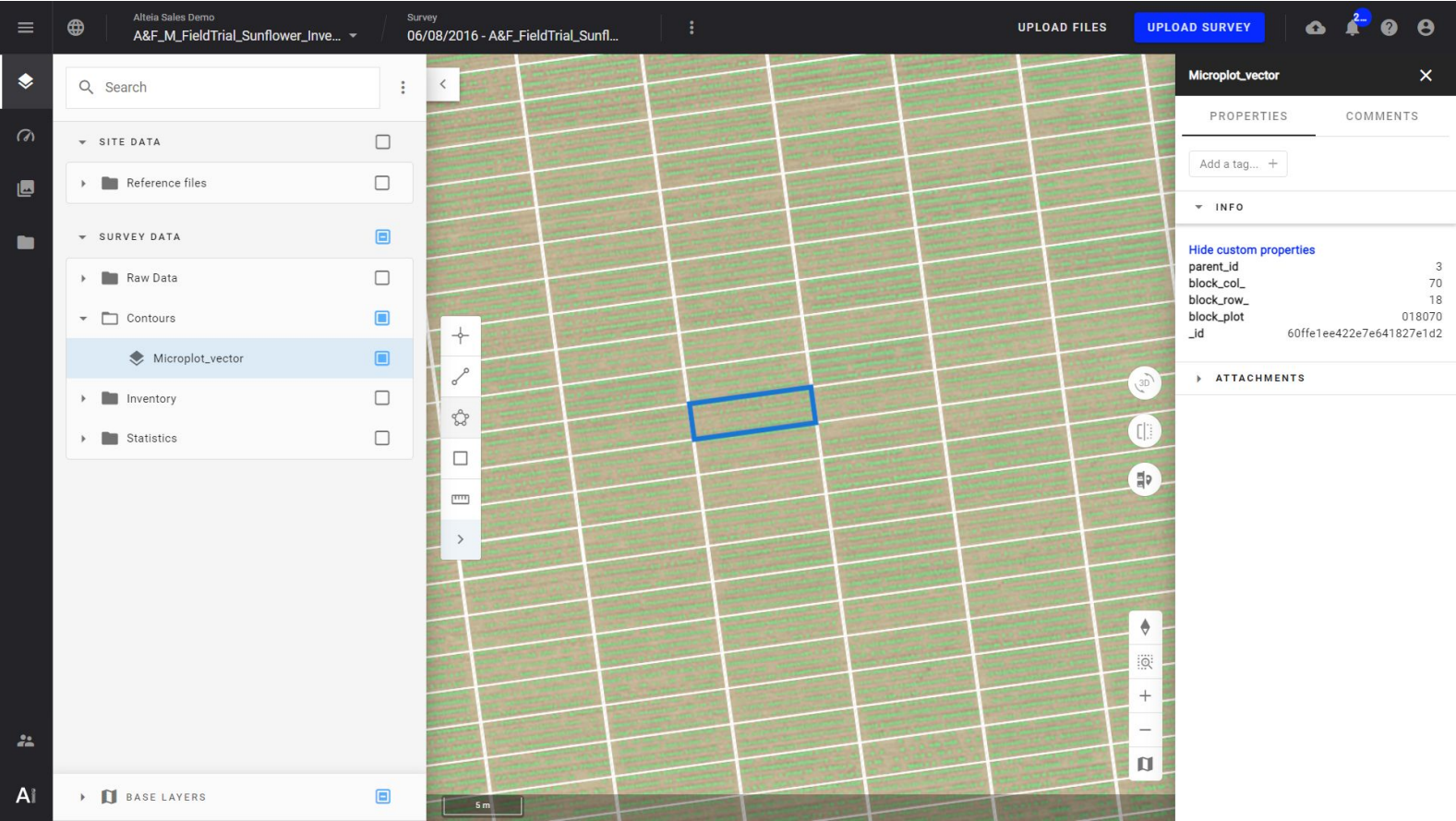
Digital phenotyping: Photogrammetry

Pix4d photogrammetry engine

Agisoft photogrammetry engine



Alteia - 2022



Digital phenotyping: Trait extraction - Plant Count

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Altea Sales Demo

A&F_M_FieldTrial_Sunflower_Inve...

Survey

06/08/2016 - A&F_FieldTrial_Sunfl...

UPLOAD FILES

UPLOAD SURVEY

Search

Reference files

SURVEY DATA

Raw Data

Contours

Inventory

Fraction of vegetation cover

Plant height

Plant and gap counting

Plant count

Gaps

Rows with plant count

Plants

Statistics

BASE LAYERS

Plant count

PROPERTIES

COMMENTS

Add a tag... +

INFO

Length 0.55m

Plants count 113

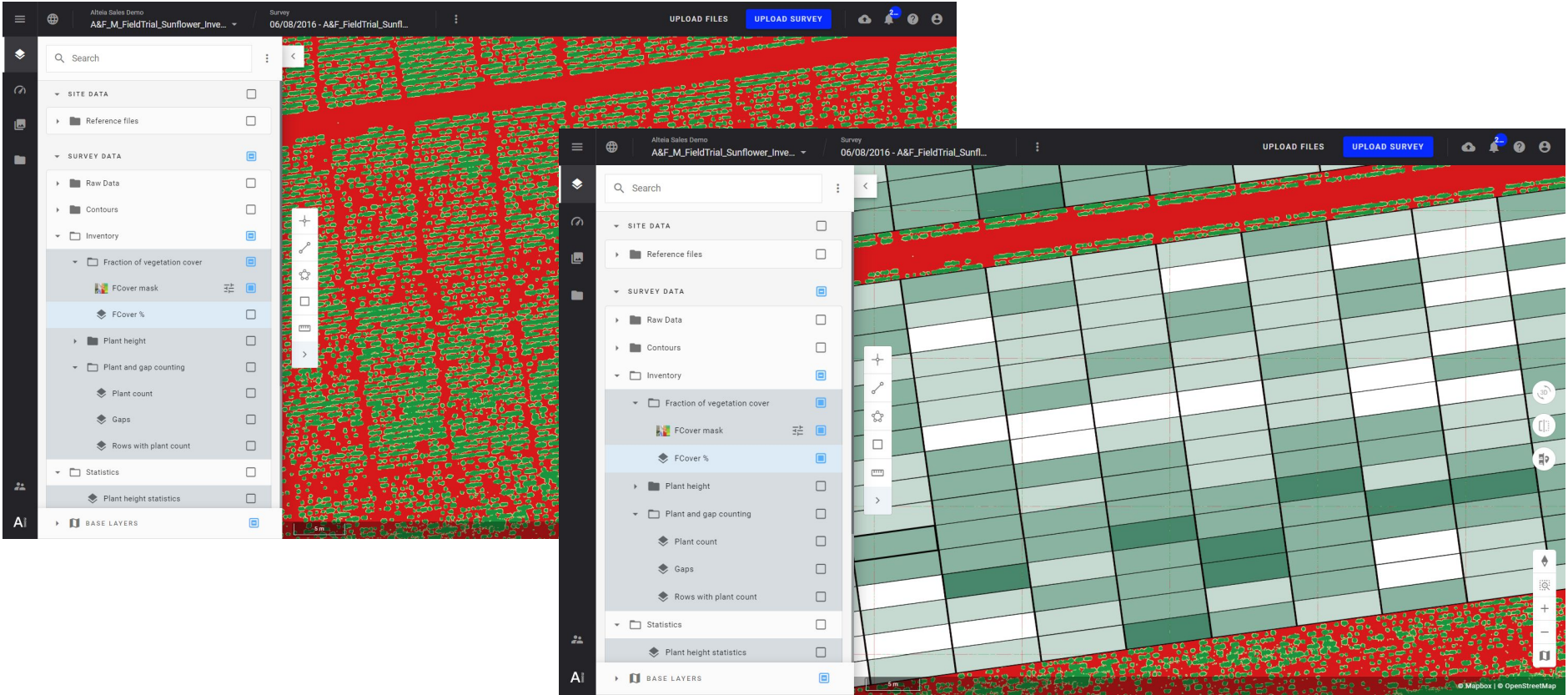
Gaps 0.08m

Show custom properties

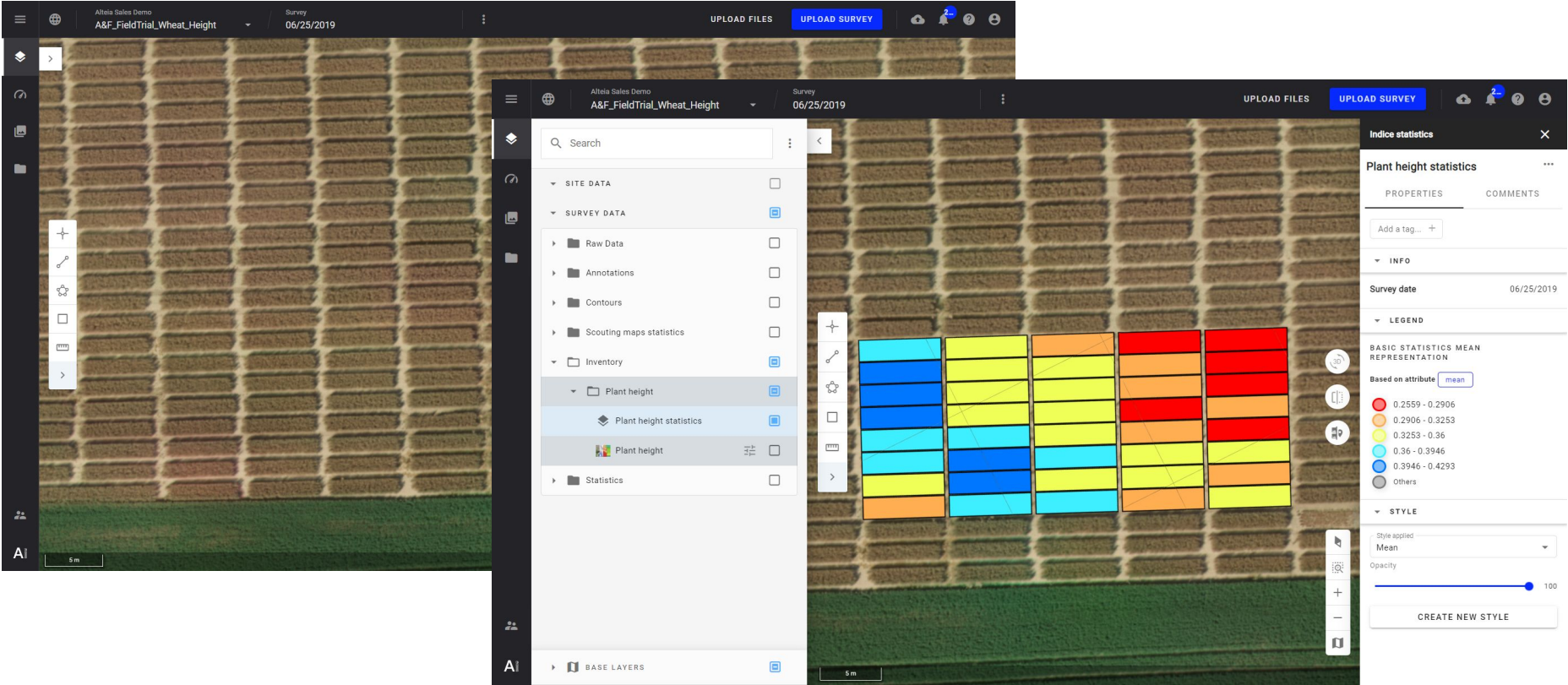
ATTACHMENTS

2m

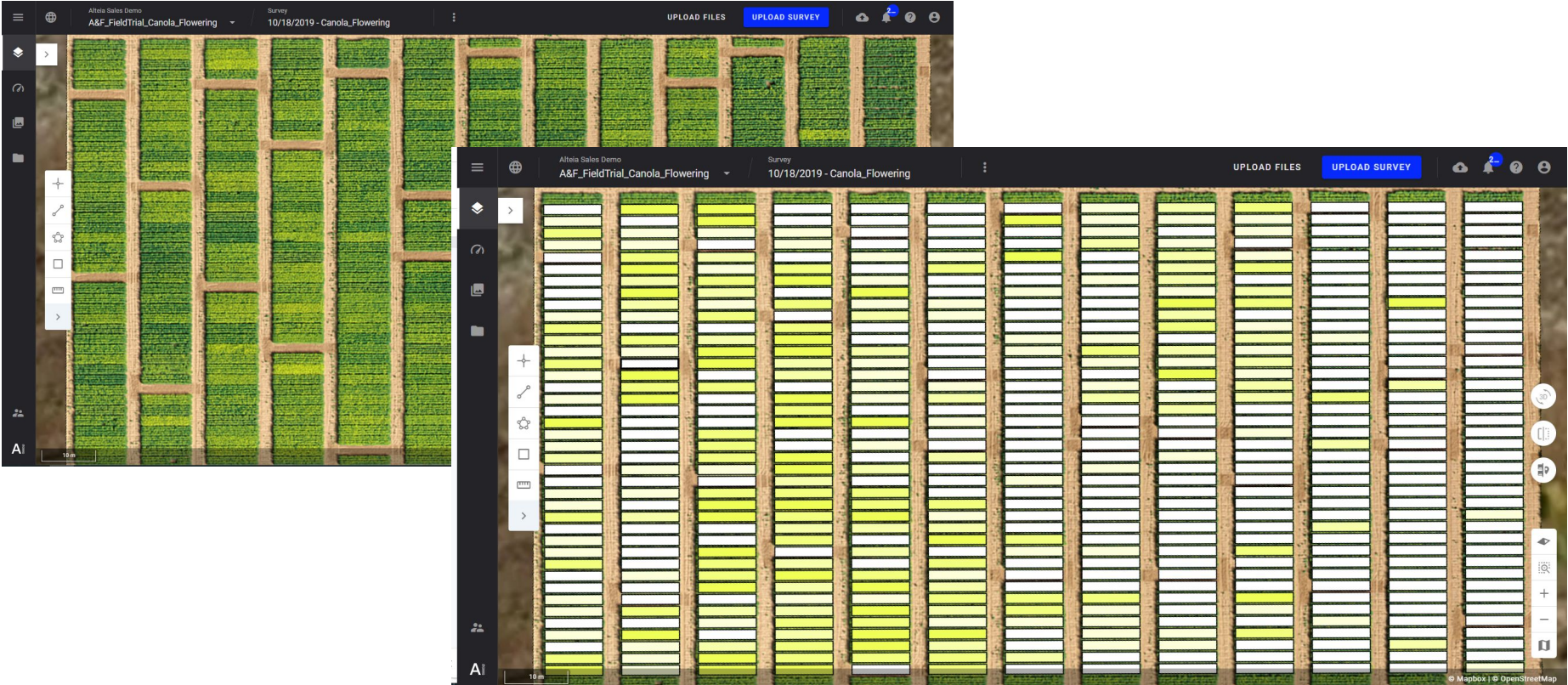
Digital phenotyping: Trait extraction - Fraction of Vegetation cover



Digital phenotyping: Trait extraction - Plant Height

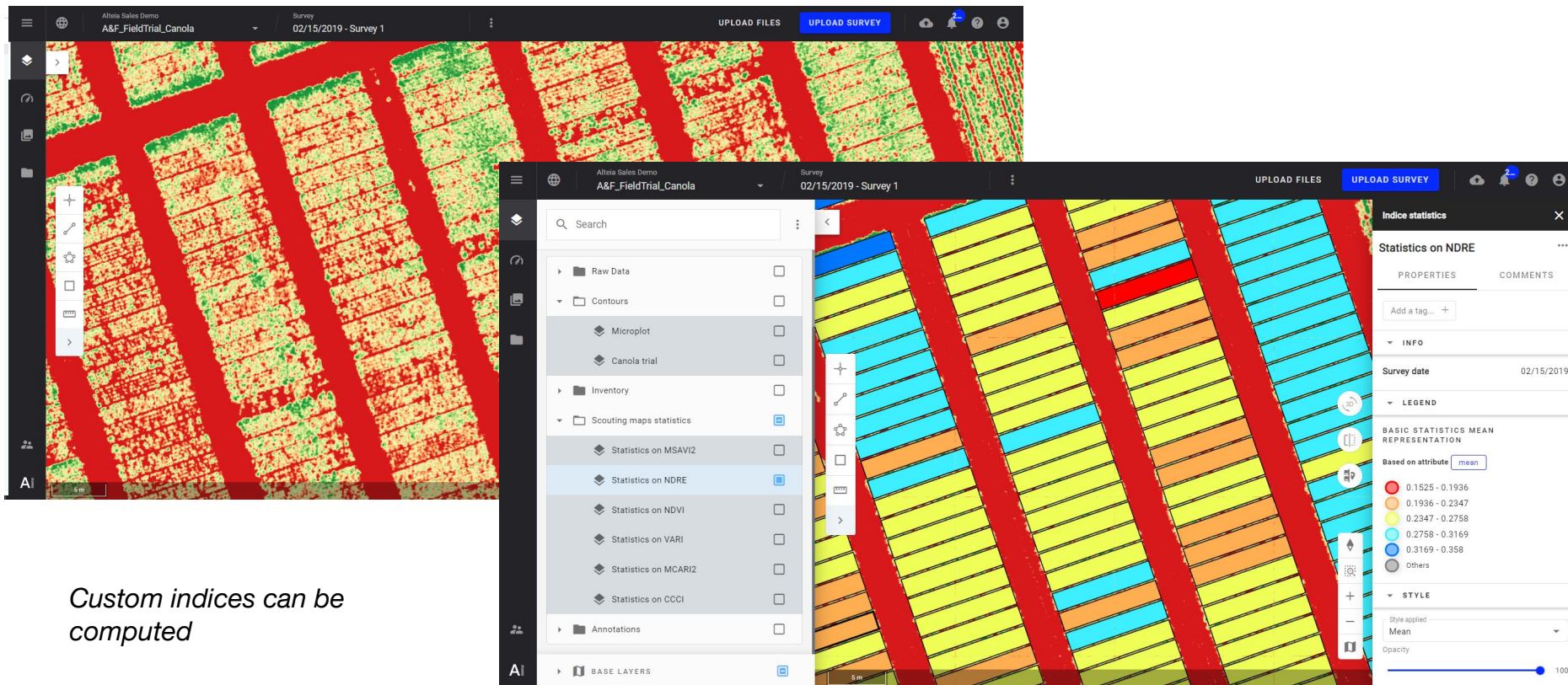


Digital phenotyping: Trait extraction - Flowering characterization



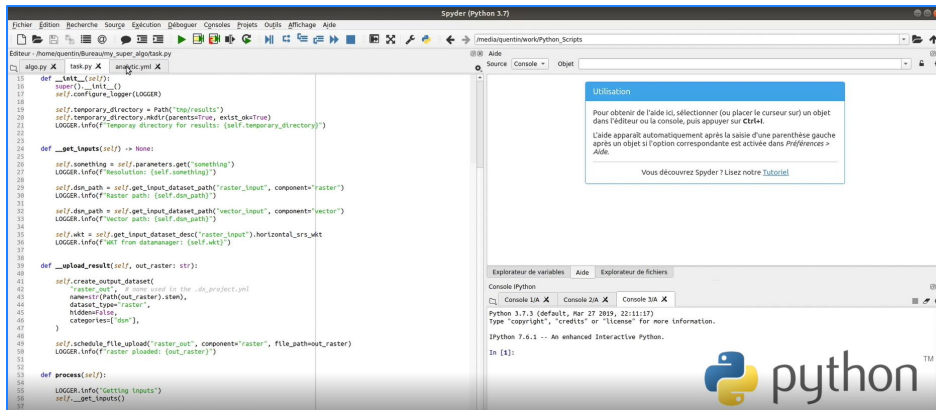
Digital phenotyping: Trait extraction - Vegetation index statistics

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Digital phenotyping: Deploy your own analytics app

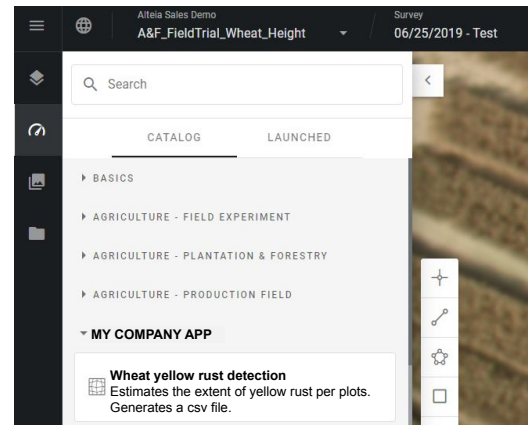
Code your app



```

15 def __init__(self):
16     super().__init__()
17     self.configure_logger(LOGGER)
18
19     self._temporary_directory = Path("tmp/results")
20     self._temporary_directory.mkdir(parents=True, exist_ok=True)
21     LOGGER.info(f"Temporary directory for results: {self._temporary_directory}")
22
23
24 def __get_inputs(self) -> None:
25
26     self.something = self.parameters.get("something")
27     LOGGER.info(f"Initialization: {self.something}")
28
29     self._dsn_path = self.get_input_dataset_path("raster_input", component="raster")
30     LOGGER.info(f"Raster path: {self._dsn_path}")
31
32     self._dsn_path = self.get_input_dataset_path("vector_input", component="vector")
33     LOGGER.info(f"Vector path: {self._dsn_path}")
34
35     self.wkt = self.get_input_dataset_desc("raster_input").horizontal_srs_wkt
36     LOGGER.info(f"WKT from datamanager: {self.wkt}")
37
38
39 def __upload_result(self, out_raster: str):
40
41     self.create_output_dataset(
42         raster_out = f"raster_out_{self._dsn_path}.tif",
43         name="raster_out_raster.tif",
44         dataset_type="raster",
45         hidden=False,
46         categories=["dar"],
47     )
48
49     self.schedule_file_upload("raster_out", file_path=out_raster)
50     LOGGER.info(f"Raster uploaded: {out_raster}")
51
52
53 def process(self):
54     LOGGER.info("Getting inputs")
55     self.__get_inputs()
  
```

Run it in Alteia



Digital phenotyping: Navigation & Manual scoring

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The screenshot displays a digital phenotyping software interface. The main view shows a field plot with a blue rectangle and yellow lines. The interface includes a top navigation bar with the user name 'Alexis Janson', the survey name 'A&F_FieldTrial_SunflowerPhenoty...', the date '06/08/2016 - 2016-06-08 (A&F_Fi...', and buttons for 'UPLOAD FILES' and 'UPLOAD SURVEY'. A sidebar on the left contains a 'Filter - block_plot' panel with a dropdown menu set to 'block_plot' and a list of values: 002053, 002054, 002055, 002056, 002057, 002058, and 002059. Below the filter panel is an 'ADD A FILTER' button. The right sidebar shows the 'Microplot_vector_SHP' panel with a 'PROPERTIES' tab selected. The properties panel includes fields for 'parent_id *' (3), 'block_col_*' (57), 'block_row_*' (2), 'block_plot *' (002057), 'Jid *' (5f0478ac72e0be1703478efa), and 'Observation' (Low density). The bottom of the interface features a 'BASE LAYERS' panel and a scale bar indicating 2 m.

Microplot_vector_SHP

Filter - block_plot

Based on attribute
block_plot

Values

002053 002054 002055 002056 002057 002058 002059

ADD A FILTER

Microplot_vector_SHP

3 / 7

PROPERTIES COMMENTS

Add a tag... +

INFO

parent_id *
3

block_col_*
57

block_row_*
2

block_plot *
002057

Jid *
5f0478ac72e0be1703478efa

Observation
Low density

ATTACHMENTS

[Left/Right arrow] To navigate through feature [Tab/Shift+Tab] Go to next/previous attribute / [Enter] Save last focused attribute / [Escape] Leave attribute

BASE LAYERS

2 m

Digital phenotyping: Data export

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The screenshot shows the 'Season Planner' web application. At the top, there's a 'Trial dashboard' with buttons for 'GENERATE CAPTURE TASKS', 'PLOTS', '+ NEW TRIAL', and 'MANAGE'. Below this is a search bar and a table of trials. The table has columns for trial name, year, description, and number of capture tasks. A context menu is open over the table, showing options like 'Edit', 'Duplicate', 'Delete', 'Edit plots', 'Edit DTM', 'Add mission', 'Export APV values', 'Remove generated tasks', and 'See generated tasks'. The bottom right corner shows 'Items per page: 50'.

Trial Name	Year	Description	Capture Tasks
JZ TEST	2022	Alteia Sales Demo A&F_M_FieldTrial_Sunflower_Inven...	2 capture tasks
WHEAT - FIELD EXPERIMENT - ALTEIA DEMO	2021	Alteia Sales Demo A&F_FieldTrial_SeasonPlanner&DataCa...	1 capture tasks
VINE TRIAL - ALTEIA DEMO	2021	Alteia Sales Demo A&F_M_Production_Vineyard_Inven...	1 capture tasks
SUNFLOWER - FIELD EXPERIMENT - ALTEIA DEMO	2021	Alteia Sales Demo A&F_M_FieldTrial_Sunflower_Inven...	4 capture tasks

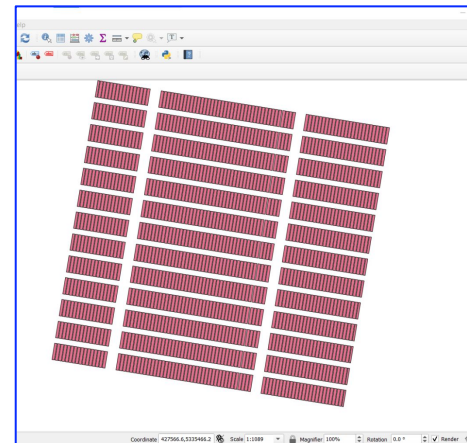
CSV

The screenshot shows a CSV file in a spreadsheet application. The data is organized into columns: 'block_plot', 'emergence', 'plant_count', and others. The rows contain numerical data for various plots.

block_plot	emergence	plant_count			
5019	29.04789726	85			
5020	26.41307119	93			
5021	26.06206594	83			
5022	26.9653818	99			
5023	27.7336707	81			
5024	23.76750334	96			
5025	27.05169793	89			
5026	29.15334622	91			
5027	27.15438908	99			
5028	23.67546533	81			
5029	25.47452762	81			
5030	25.32693984	80			
5031	26.23109724	82			

API

GIS Formats (shp, geojson...)



Training and Expertise consulting

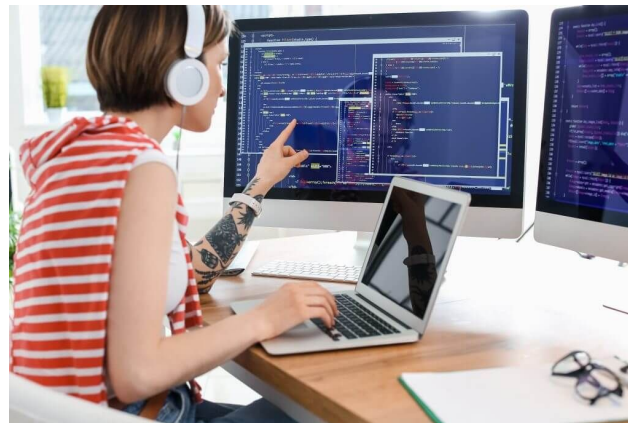
- Alteia Platform onboarding
- GIS, photogrammetry, sensor topics applied to phenotyping
- Alteia SDK and APIs
- CLI Support (custom analytics integration within the Alteia platform)

Data processing service

- Alteia support for processing complex data sets or sensors

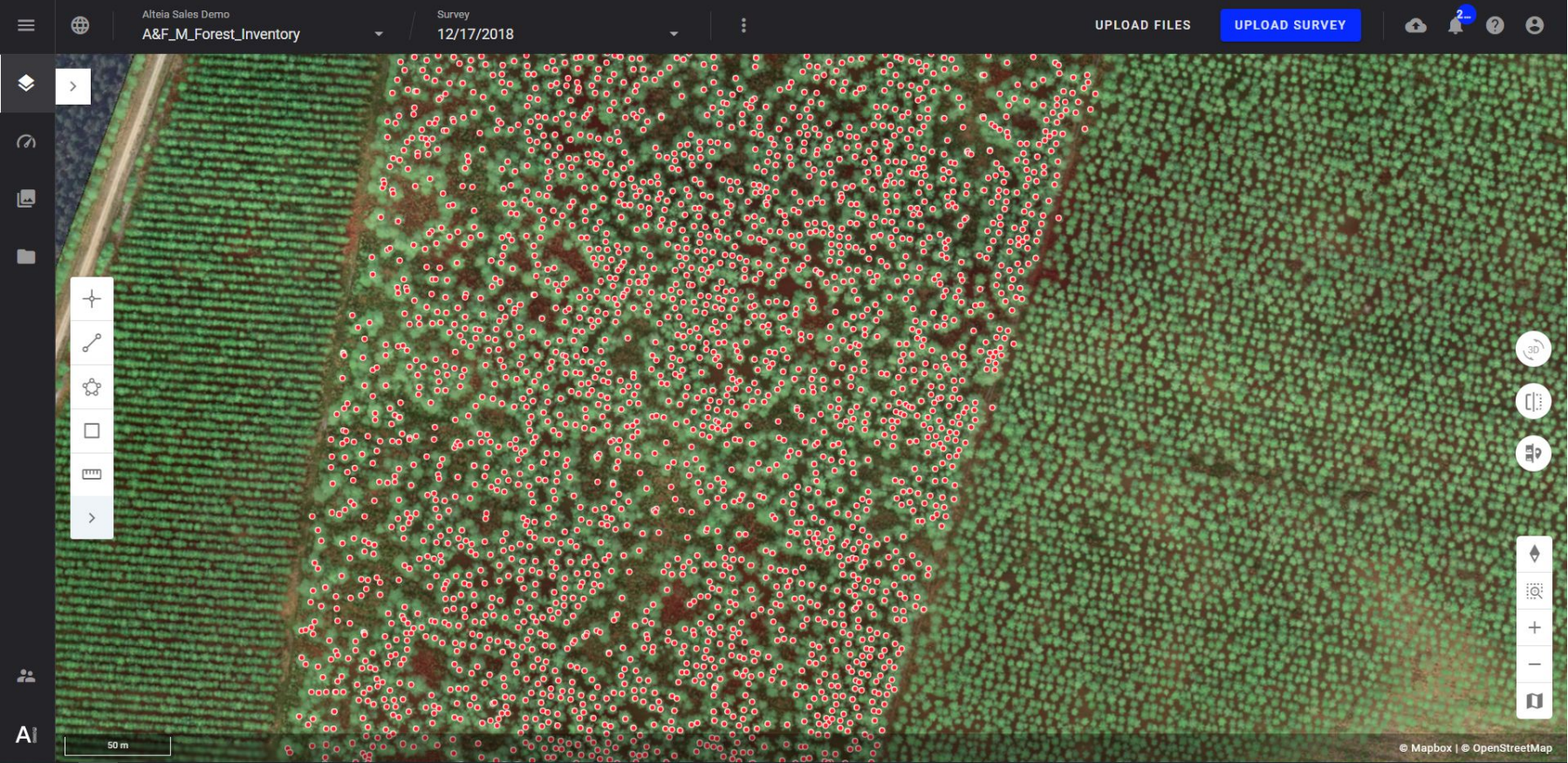
Data science

- Development of new phenotyping applications (traits...)



Other applications - Precision Agriculture





THANK YOU

alexis.janson@alteia.com