SESSION – WEDNESDAY 20 SEPTEMBER

EOSC SYMPOSIUM 2023

AI4PHENO
Software services for image analysis in phenological research enhanced by Artificial Intelligence (AI)

Poznan University of Life Sciences
&
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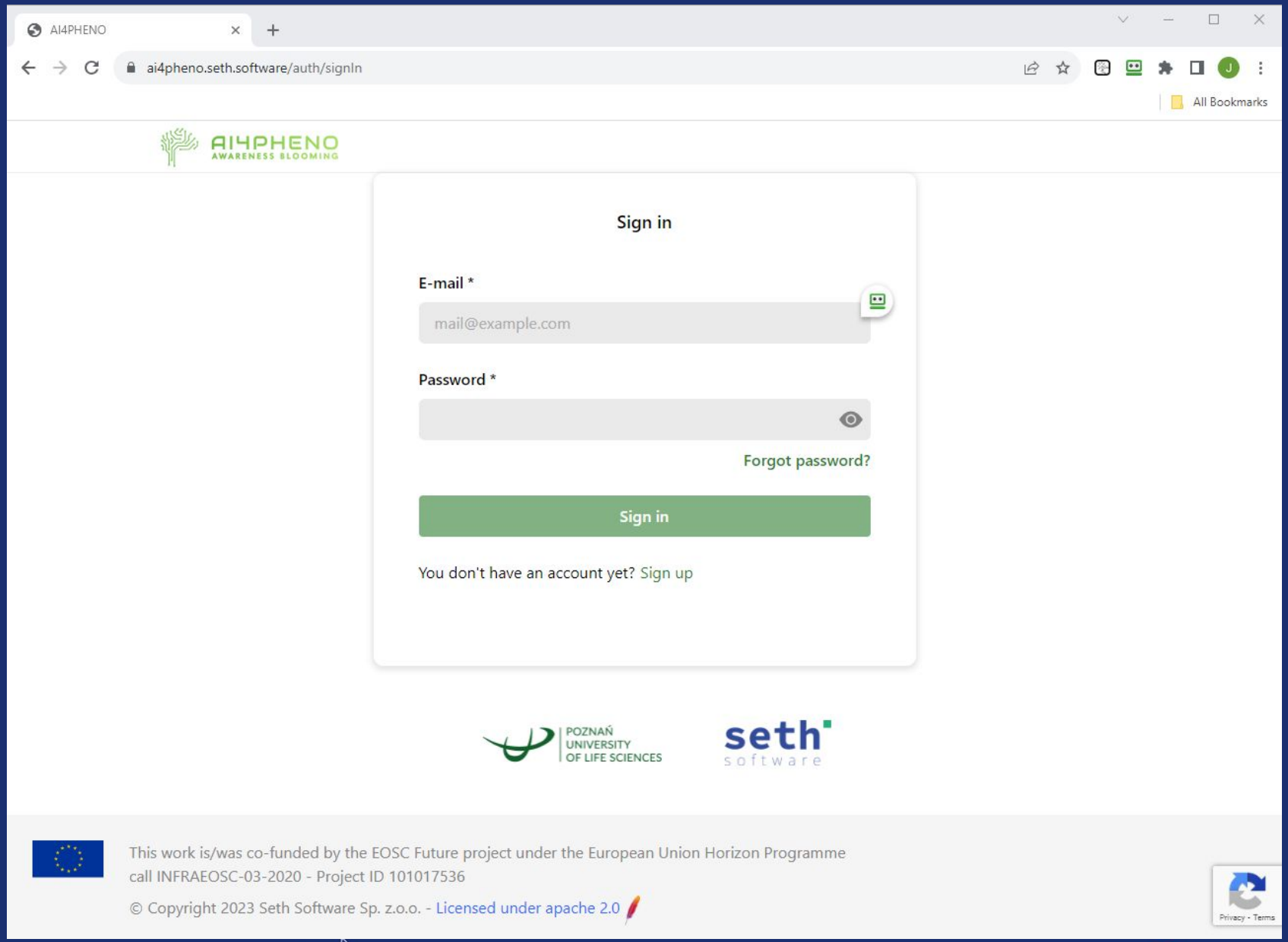
Jaroslaw Kurek

eosc

EOSC Future

EU23 SPANISH PRESIDENCY COUNCIL OF THE EUROPEAN UNION

Funded by the European Union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POZNAŃ UNIVERSITY OF LIFE SCIENCES
seth software
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Main functionalities of the platform include:

- ✔ The platform currently focuses on two plant species: linden and apples, with the flexibility to add more species based on need.
- ✔ Automatic retrieval of images from cameras located on fields, orchards, etc.
- ✔ Manual creation of new data sources (images) for a specific logged-in user (via Google disk or local disk).
- ✔ Integration with the nearest weather stations to the data sources.
- ✔ Utilization of existing AI algorithms for automatic classification and semantic segmentation of linden and apples (ROI).
- ✔ Statistical analysis of data returned by the AI models for phenological analysis.

AI models:

✔ **For linden:**

- Linden flowering classification (CNN)
- Semantic segmentation for Linden (Mask RCNN)

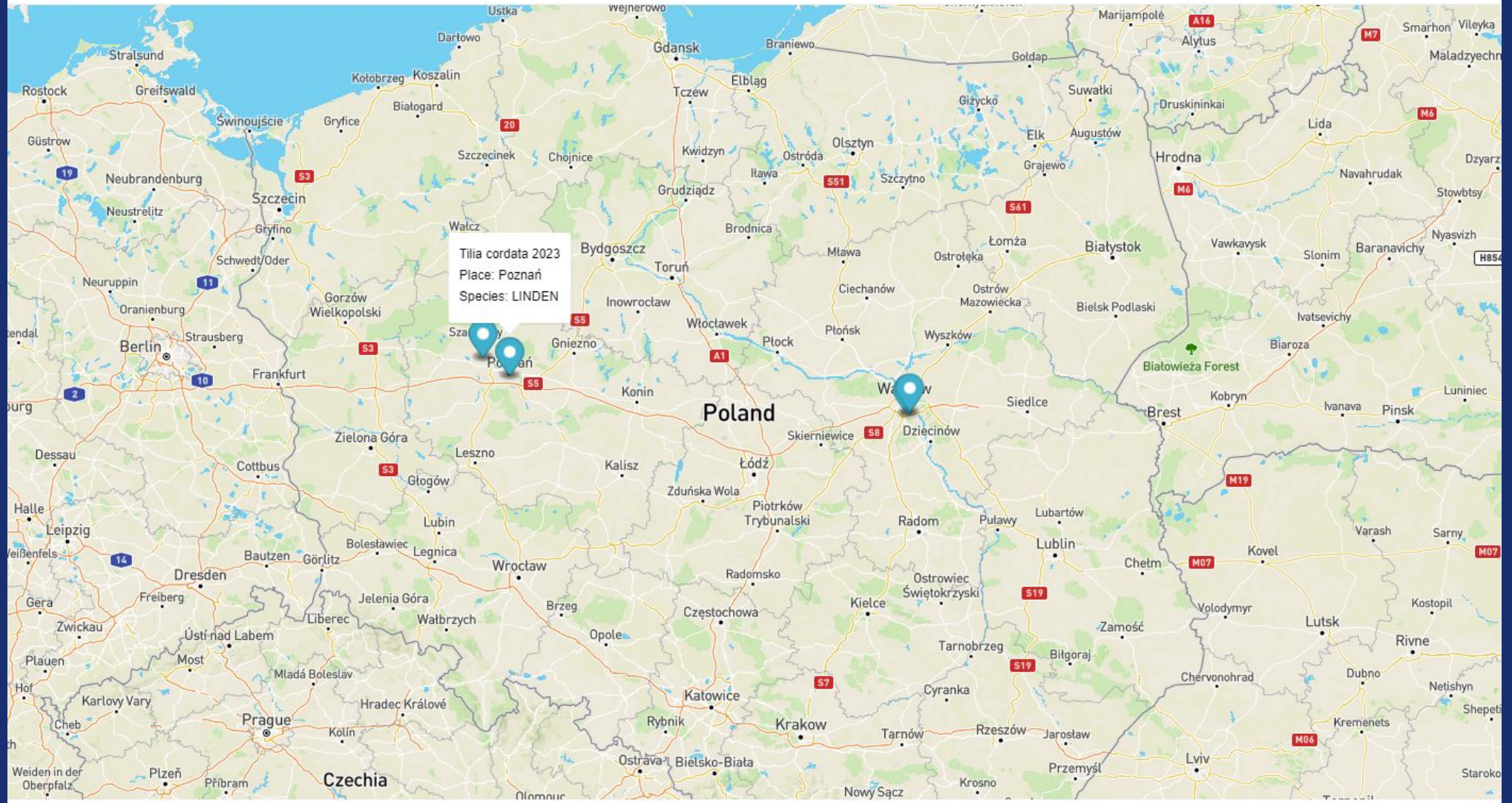
✔ **For apples:**

-Semantic segmentation for apples (Mask RCNN)

ai4pheno.seth.software/maps

AI4PHENO
AWARENESS BLOOMING

Dashboard | Image sources | Maps | User Manual



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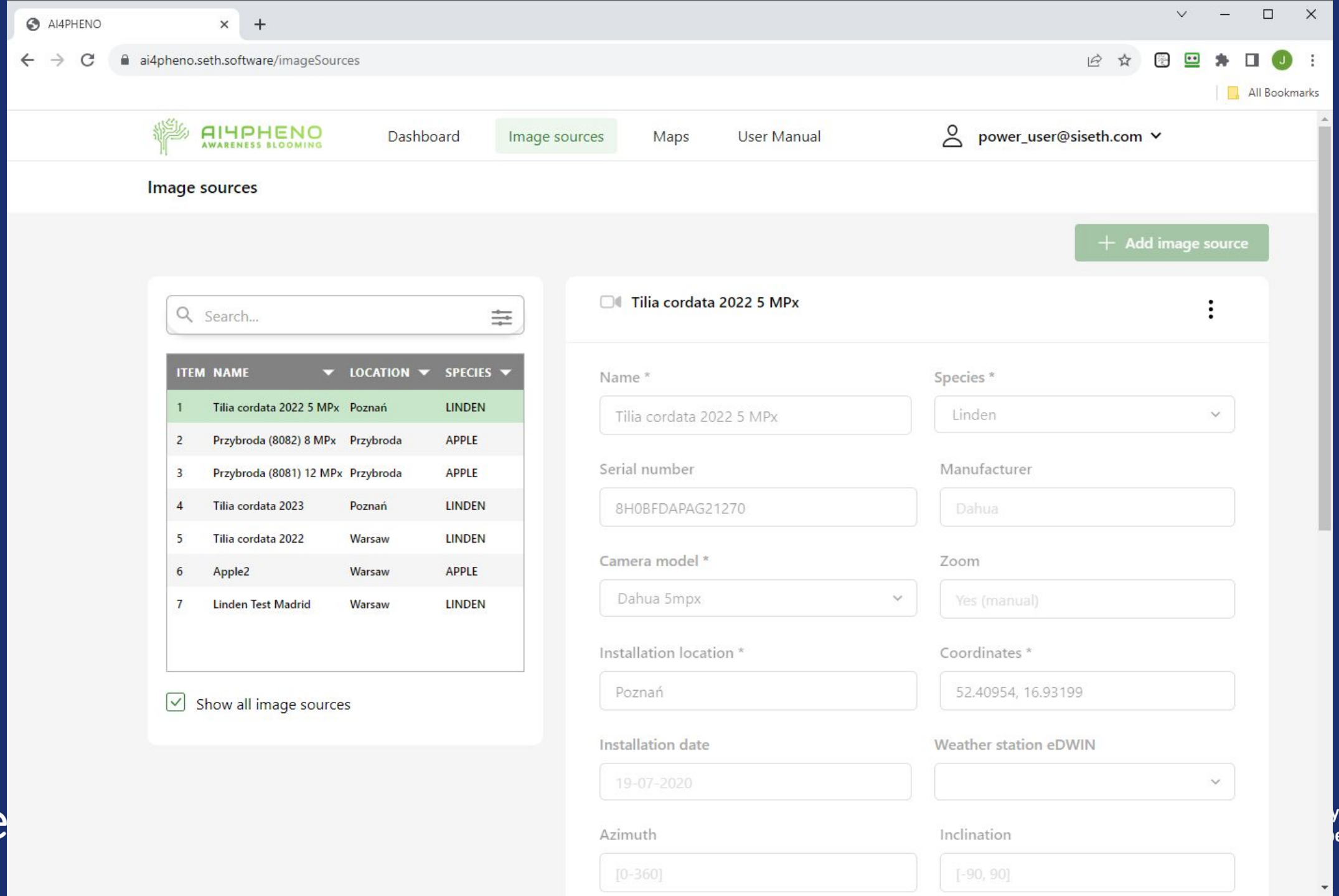
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Image sources
Maps
User Manual
power_user@siseth.com
Image sources
Add image source
Search...
ITEM NAME LOCATION SPECIES
1 Tilia cordata 2022 5 MPx Poznań LINDEN
2 Przybroda (8082) 8 MPx Przybroda APPLE
3 Przybroda (8081) 12 MPx Przybroda APPLE
4 Tilia cordata 2023 Poznań LINDEN
5 Tilia cordata 2022 Warsaw LINDEN
6 Apple2 Warsaw APPLE
7 Linden Test Madrid Warsaw LINDEN
Show all image sources
Tilia cordata 2022 5 MPx
Name *
Tilia cordata 2022 5 MPx
Species *
Linden
Serial number
8H0BFDAPAG21270
Manufacturer
Dahua
Camera model *
Dahua 5mpx
Zoom
Yes (manual)
Installation location *
Poznań
Coordinates *
52.40954, 16.93199
Installation date
19-07-2020
Weather station eDWIN
Azimuth
[0-360]
Inclination
[-90, 90]

ai4pheno.seth.software/imageSources

Show all image sources

Installation location *

Poznań

Coordinates *

52.40954, 16.93199

Installation date

19-07-2020

Weather station eDWIN

Azimuth

[0-360]

Inclination

[-90, 90]

Data entry person *

(power_user@siseth.com)

Creation date *

30-08-2023 10:57

Remarks

Exposure compensation 29.10.2020

Images

31-07-2023 11:15

30-07-2023 11:14

30-07-2023 11:04

29-07-2023 11:13

+ Upload files

See all images >

ai4pheno.seth.software/analysis

All Bookmarks

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Image sources

< Return to image sources

Analysis for Tilia cordata 2023

- Create a new analysis
- Your analysis

Tilia cordata 2023 - Analysis Config

Analysis Name *

Analysis Name

Analyzed Species *

Linden

Model analysis *

Standard model for apple tree

- Classification model - with ROI defined (linden)
- Segmentation model - ROI not defined (linden)

- [x] Exclude too bright
- [x] Exclude too dark
- [x] Exclude based on Sun elevation

Currently assigned ROI:

ROI

+ Create ROI for analysis

ROI preview

Save Analysis Config

Image sources

Return to Your analysis

Visualize data

Tilia cordata 2023 -

PHOTO	NUMBER	G_AV
	0	59.84005
	0	55.44941
	0	57.3837
	0	59.23506
	0	67.40991
	1	63.67695
	1	63.49498
	0	52.64945
	0	63.86015
	0	48.68198
	0	49.6738
	0	55.88305

ROI

Filename: 00.12[R][0@0][0].jpg

Creation date: 25-07-2023 11:00

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Image sources

Return to image sources

Analysis for Tilia co

Create a new analy

Your analysis

ROI | Rectangle | Save ROI

Rectangle
Circular
Ellipsis
Polygon

Filename: 15.28[R][0@0][0].jpg

Creation date: 31-07-2023 11:15

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Image sources

Return to Your analysis

Visualize data

Tilia cordata 2023 - Test4

PHOTO	NUMBER_OF_LINDENS	IS_FLOWERING	AVG_AREA	AVG_HEIGHT	AVG_WIDTH	B_AV	B_SD	BI_AV	BI_SD	BRI_AV	BRI_SD	G_AV
	0	1	102254	454	305	52.70169	32.74695	0.32277	0.04004	159.92771	95.98201	59.84005
	0	1	102254	454	305	48.62704	30.148	0.32534	0.03727	147.02322	88.29117	55.44941
	0	1	102254	454	305	51.09121	32.40768	0.33233	0.04281	151.78756	94.88087	57.3837
	0	1	102254	454	305	53.70187	34.29734	0.34581	0.04567	154.89258	98.84329	59.23506
	0	1	102254	454	305	60.13137	44.39728	0.31743	0.05675	181.82668	128.13818	67.40991
	1	1	102254	454	305	57.2098	41.5171	0.32705	0.05431	170.16793	119.43023	63.67695
	1	1	102254	454	305	56.51486	32.03643	0.32259	0.03657	172.28106	94.39006	63.49498
	0	1	102254	454	305	47.65523	29.63737	0.32377	0.0305	145.4574	88.14033	52.64945
	0	1	102254	454	305	57.16689	40.03039	0.32084	0.0524	172.54598	116.12028	63.86015
	0	1	102254	454	305	44.82251	28.30697	0.33617	0.03697	132.70643	82.48582	48.68198
	0	1	102254	454	305	46.24851	29.81555	0.33807	0.0382	136.22555	86.7981	49.6738
	0	1	102254	454	305	53.34265	32.15801	0.35492	0.044	151.24908	92.35429	55.88305

Report *

RGB indices averaged for ROI

Chart type *

R+G+B

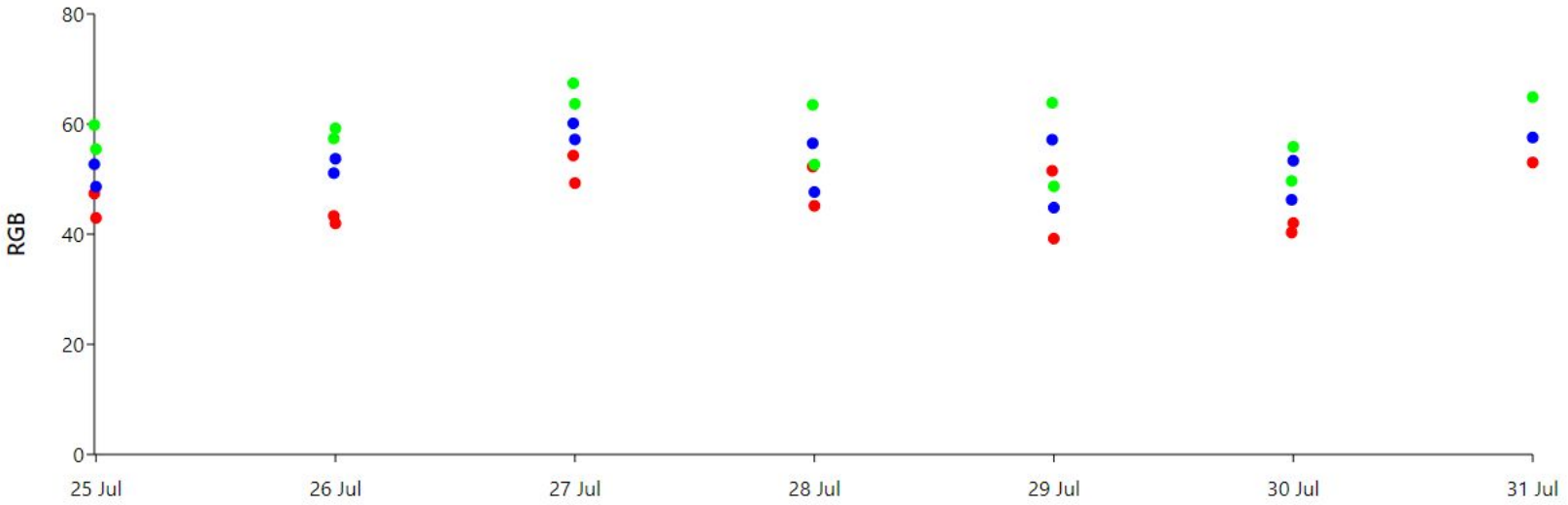
Time interval

21/06/2023 - 22/06/2023

Create a chart

Reports generated

Averaged for ROI (R+G+B)



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Report generation - Test4

Report *

Meteorogical data: temperature, precipitation

Time interval

21/06/2023 - 22/06/2023

Create a chart

Reports generated

Temperature

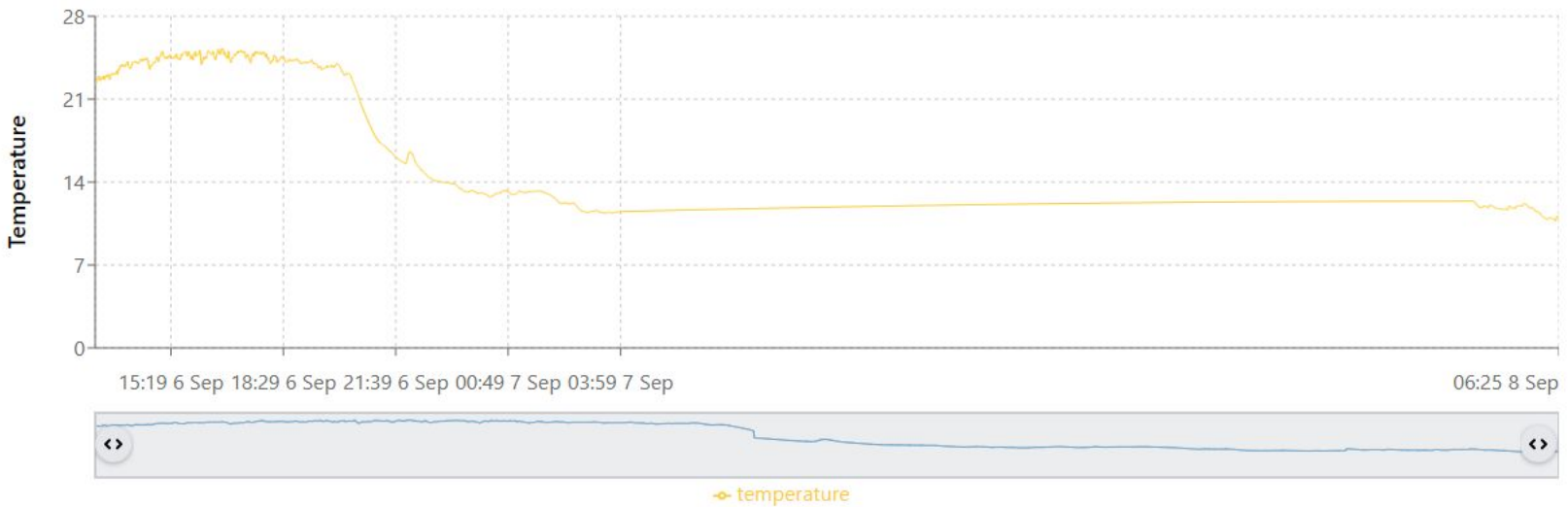

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Image sources

Return to Your analysis

Visualize data

Tilia cordata 2022 5

PHOTO	NUMBER		G_AV
		599	59.16076
		35	57.54331
		768	59.24165
		482	64.10691
		04	60.1444
		21	56.9726
		73	49.52738
		59	52.58401
		92	54.61953
		17	52.24127
		534	60.58874

ROI

Filename: ODUPP_2022.06.30.11.35.53.jpg

Creation date: 30-06-2022 11:35

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Return to Your analysis

Visualize data

Przybroda (8082) 8 I

ROI

Filename: 001_20230911103110_[R][0@0][0].jpg

Creation date: 11-09-2023 10:31

	43	56.38543
	50	55.79925
	53	55.62592
	58	57.52705
	65	59.00951
	60	57.92951
	60	57.4411
	63	55.31869
	62	60.58297
	62	59.81484
	60	60.94623
	56	60.68319
	54	63.12056

Return to Your analysis

Visualize data

Przybroda (8082) 8 I

ROI

Filename: 001_20230911103110_[R][0@0][0].jpg

Creation date: 11-09-2023 10:31

	50	55.79925
	53	55.62592
	58	57.52705
	65	59.00951
	60	57.92951
	60	57.4411
	63	55.31869
	62	60.58297
	62	59.81484
	60	60.94623
	56	60.68319
	54	63.12056

Thank you