



AMLD 2019 - AI & Trust

Frank de Morsier - CTO

ARTIFICIAL INTELLIGENCE  
FOR MAKING EARTH IMAGING  
ACCESSIBLE, SEARCHABLE  
AND INSIGHTFUL







1858



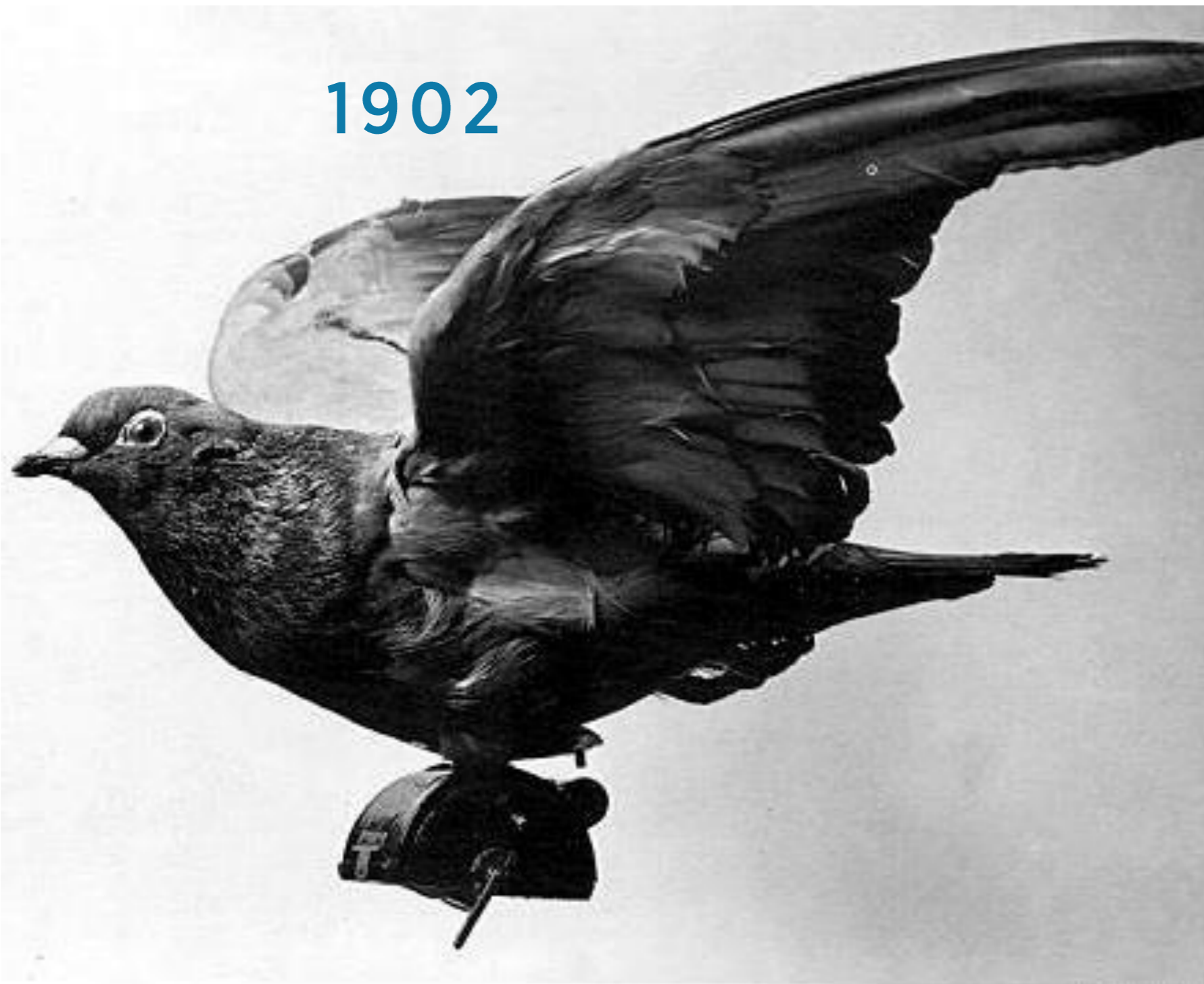
Picterra

Balloon View of Boston Taken October 13, 1860

Image: wikipedia



1902

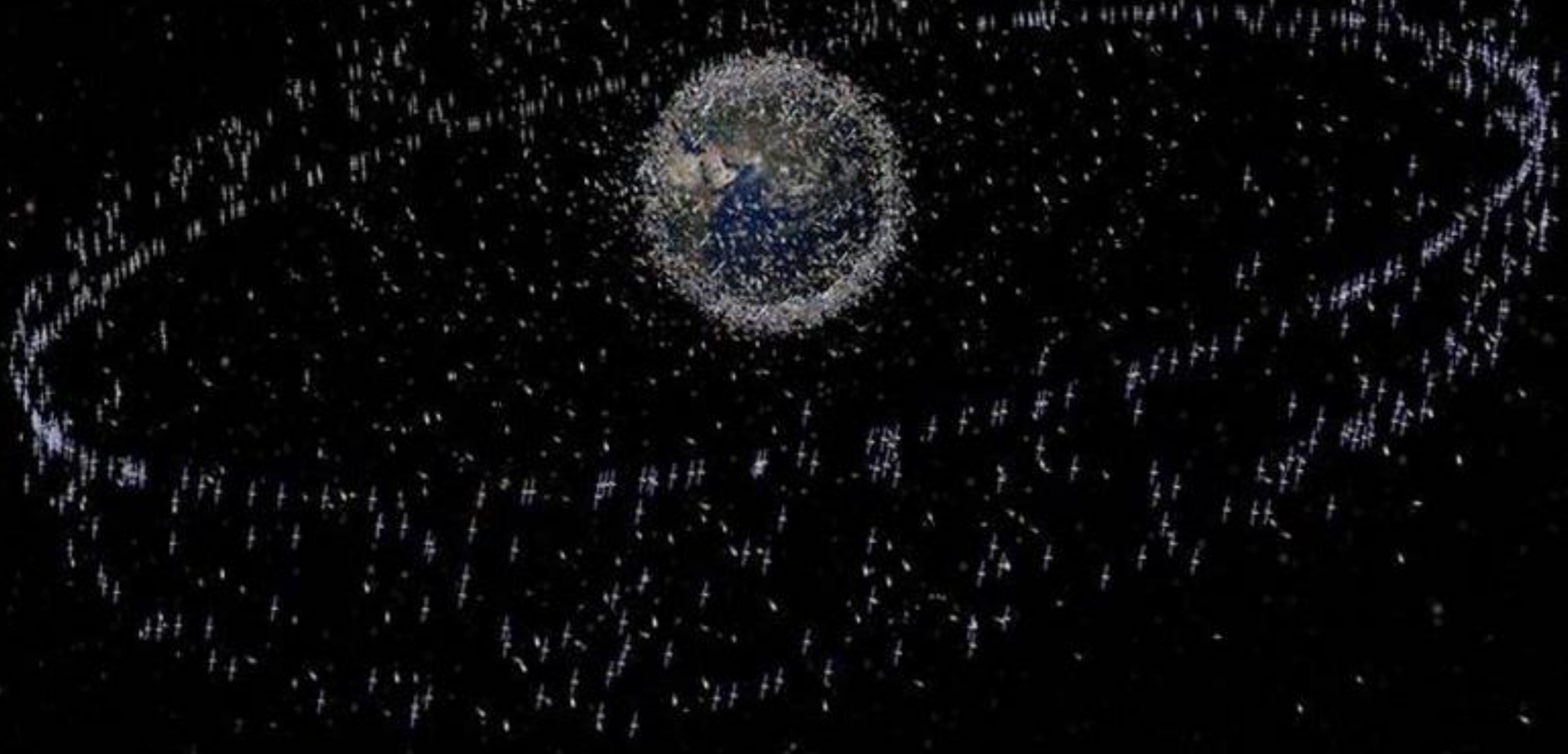


Picterra



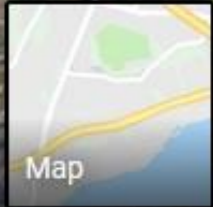
Image: wikipedia





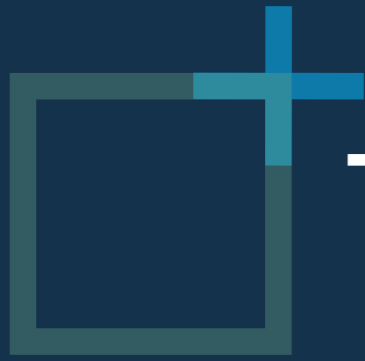


2005



Google





TODAY

Earth Observation  
+  
Artificial Intelligence



Earth Observation

+

Artificial Intelligence

=

Powerful analytical insights at scale

















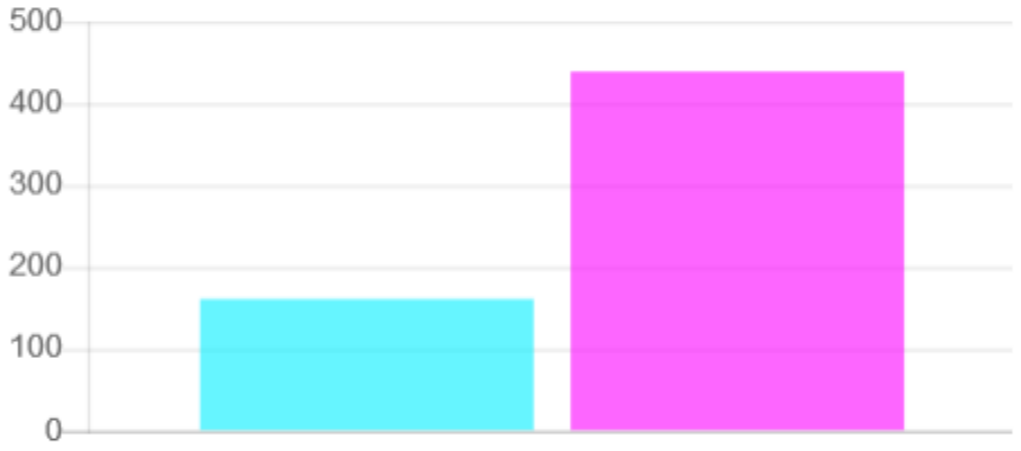
Images: 1 - Classes: 2 - Annotations: 600 - Image(s) Area: 0.51 km<sup>2</sup> - Annotated Area: 1.93 ha (4%)

Area By Class (m<sup>2</sup>)

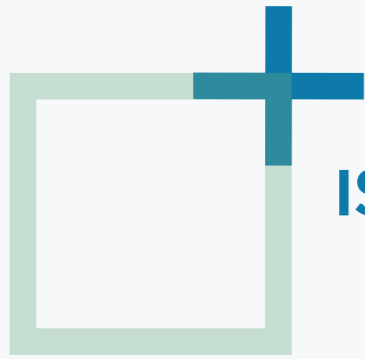
buildings vehicles



Annotations By Class







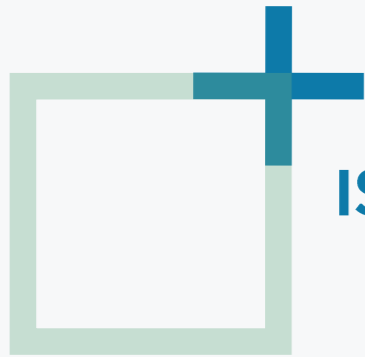
**IS IT ENOUGH?**

MACHINE LEARNING  
RESEARCH

DATA

COMPUTING PLATFORMS





IS IT ENOUGH?

## MACHINE LEARNING RESEARCH

Logos for machine learning research organizations and frameworks:

- Google AI
- Facebook AI Research
- Max Planck Institute for Intelligent Systems
- Inria
- NYU
- Caffe
- Keras
- scikit-learn
- mxnet
- theano
- CNTK
- PYTORCH
- Caffe2
- GitHub

## DATA

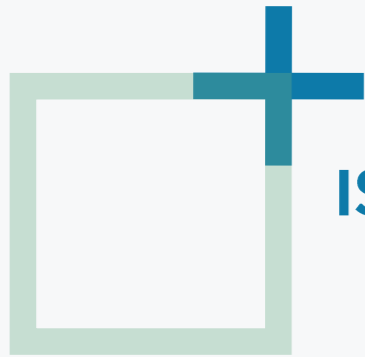


## COMPUTING PLATFORMS

Logos for computing hardware and cloud providers:

- Intel Core i9
- Microsoft Azure
- aws
- Google Cloud





# IS IT ENOUGH?

## MACHINE LEARNING RESEARCH

Logos for machine learning research organizations and frameworks including: Google AI, Facebook AI Research, Max Planck Institute for Intelligent Systems, Inria, NYU, Caffe, Keras, scikit learn, TensorFlow, CNTK, mxnet, theano, PYTORCH, Caffe2, and GitHub.

## DATA



## COMPUTING PLATFORMS

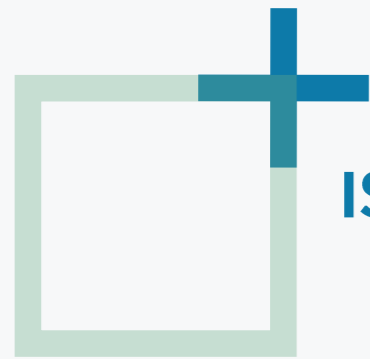
Logos for computing hardware and cloud platforms including: Intel Core i9, Microsoft Azure, AWS, and Google Cloud.

## USER OF GEOSPATIAL INFORMATION



- Drone mapper
- Urban planner
- Rescue team
- Forest guard
- National park guard
- Local communities





# IS IT ENOUGH?

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## COMPUTING PLATFORMS

Logos for Intel Core i9, Microsoft Azure, AWS, and Google Cloud.

## DATA



LARGE «GAP»

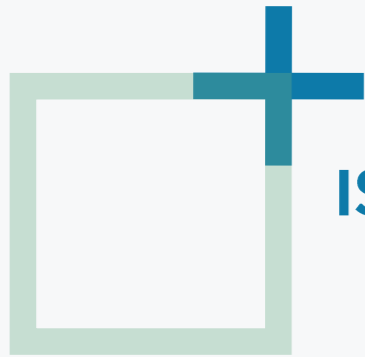


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IS IT ENOUGH?

Picterra



LARGE «GAP»



USER OF GEOSPATIAL INFORMATION



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MACHINE LEARNING RESEARCH

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COMPUTING PLATFORMS

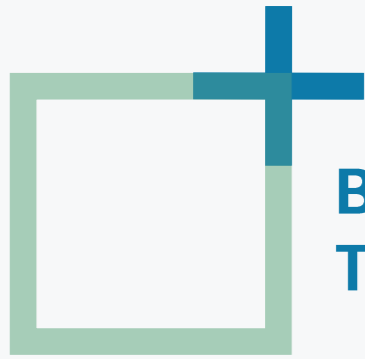
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DATA







**BRIDGING  
THE GAP**



**We  
Robotics**  
Robotics for the Benefit of All

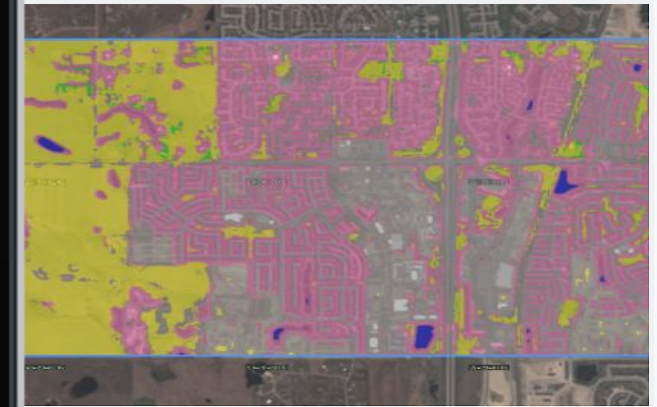
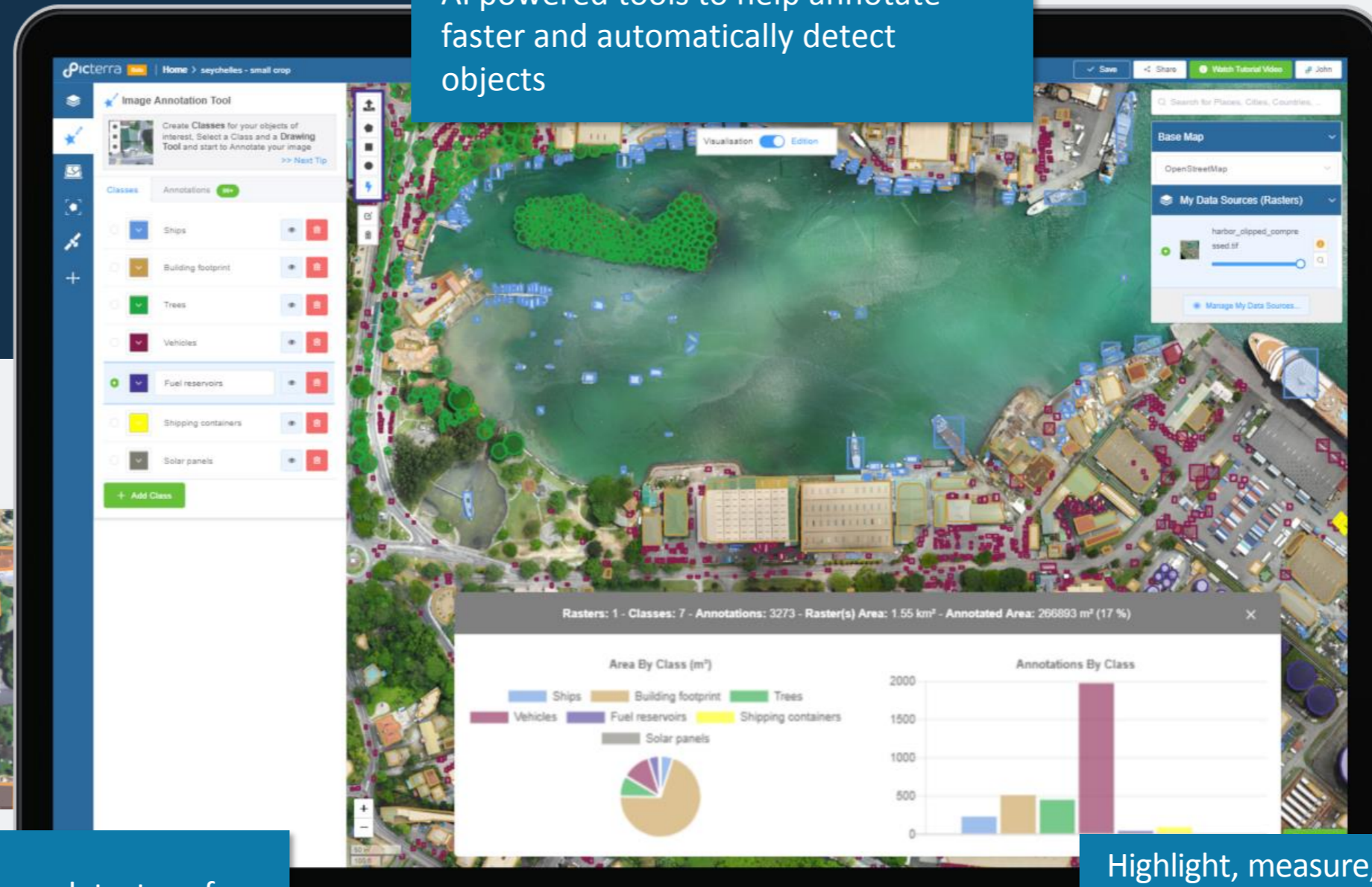
**humanity  
& inclusion**



# PICTERRA PLATFORM

SELF-SERVE TOOL  
OFFERING USERS  
ACCESS AND CONTROL

AI powered tools to help annotate  
faster and automatically detect  
objects

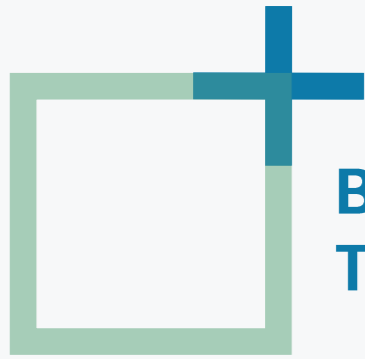


Build a custom detector of  
your objects of interest

Highlight, measure,  
count objects & share your  
projects

ANNOTATION TOOLKIT    DETECTOR LIBRARY    CUSTOM DETECTION





# BRIDGING THE GAP

**We Robotics**

Robotics for the Benefit of All

Open AI Challenge for the South Pacific



**ETH zürich**

Finalist team:  
Karla Saldaña and  
Guo Zifeng

Picterra **Beta** | Home > Coconuts

Saving | Share | John

### Image Annotation Tool

Create **Classes** for your objects of interest, Select a Class and a **Drawing Tool** and start to Annotate your image >> Next Tip

Classes Annotations **99+**

- default
- coconuts

+ Add Class

Export | Show Statistics

Visualisation  Edition

Search for Places, Cities, Countries, ...

Base Map

OpenStreetMap

My Data Sources (Rasters)

- 5b1b6fb2-5024-4681-a175-9b667174f48c\_sub\_north.tif

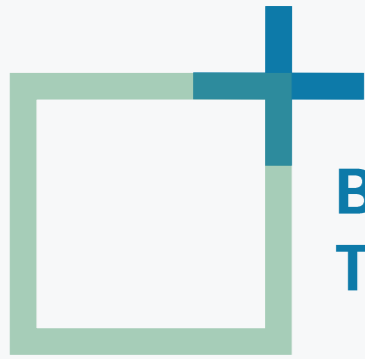
Manage My Data Sources...

100 m / 300 ft

Ask Us

Leaflet | © OpenStreetMap contributors





# BRIDGING THE GAP

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Robotics for the Benefit of All

Open AI Challenge for the South Pacific



## ETH zürich

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Karla Saldaña and Guo Zifeng

**Image Annotation Tool**

Create Classes for your objects of interest, Select a Class and a Drawing Tool and start to Annotate your image >>> Next Tip

Classes: Annotations 99+

- default
- coconuts

+ Add Class

Visualisation  Edition

Images: 1 - Classes: 1 - Annotations: 3538 - Image(s) Area: 0.61 km<sup>2</sup> - Annotated Area: 0.12 km<sup>2</sup> (20 %)

**Area By Class (m<sup>2</sup>)**

coconuts

**Annotations By Class**





CUSTOM  
DETECTOR

2





# CUSTOM DETECTOR

## 2. Define your training areas

Use the buttons below to create multiple **Training Areas** over **representative regions** of your image, at least one of them has to contain instances of your object of Interest.



Draw areas



Delete areas

You can click on training areas to edit them

[Previous Step <<](#)

[>> Next Step](#)





CUSTOM  
DETECTOR

2

Picterra








## CUSTOM DETECTOR

### 3. Annotate the objects inside your training areas

Use the **drawing tools** (top-left corner of the map) to annotate **every instance** of your class intersecting your training area(s).

 **Review all your training areas** and make sure not to miss anything, this would lower the quality of your results.

 Loop trough my training areas (Review)

[Previous Step <<](#)

[>> Next Step](#)



CUSTOM  
DETECTOR





# BANDGLADESH



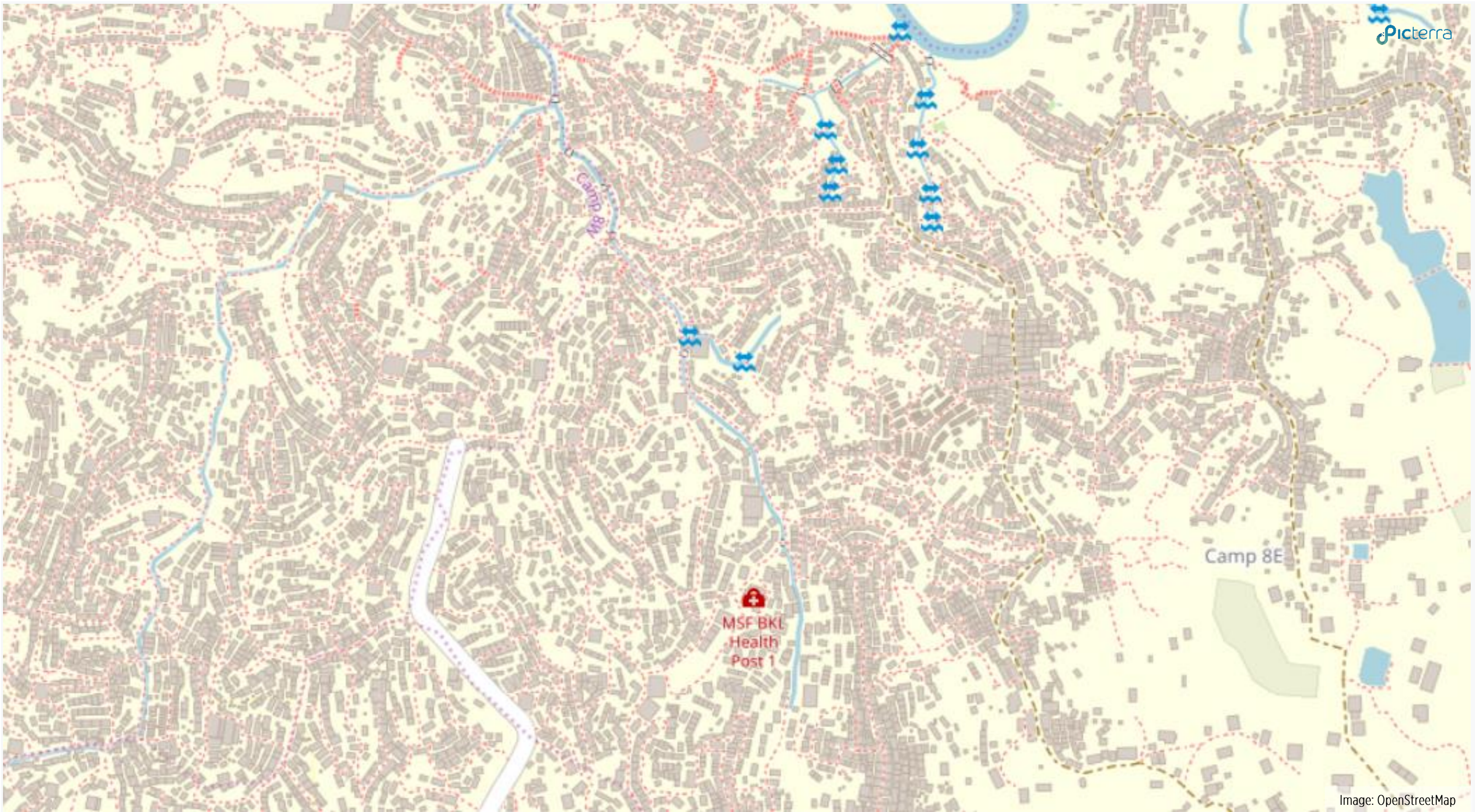




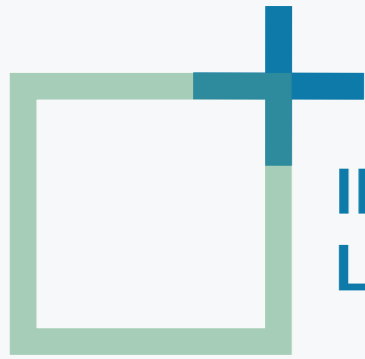




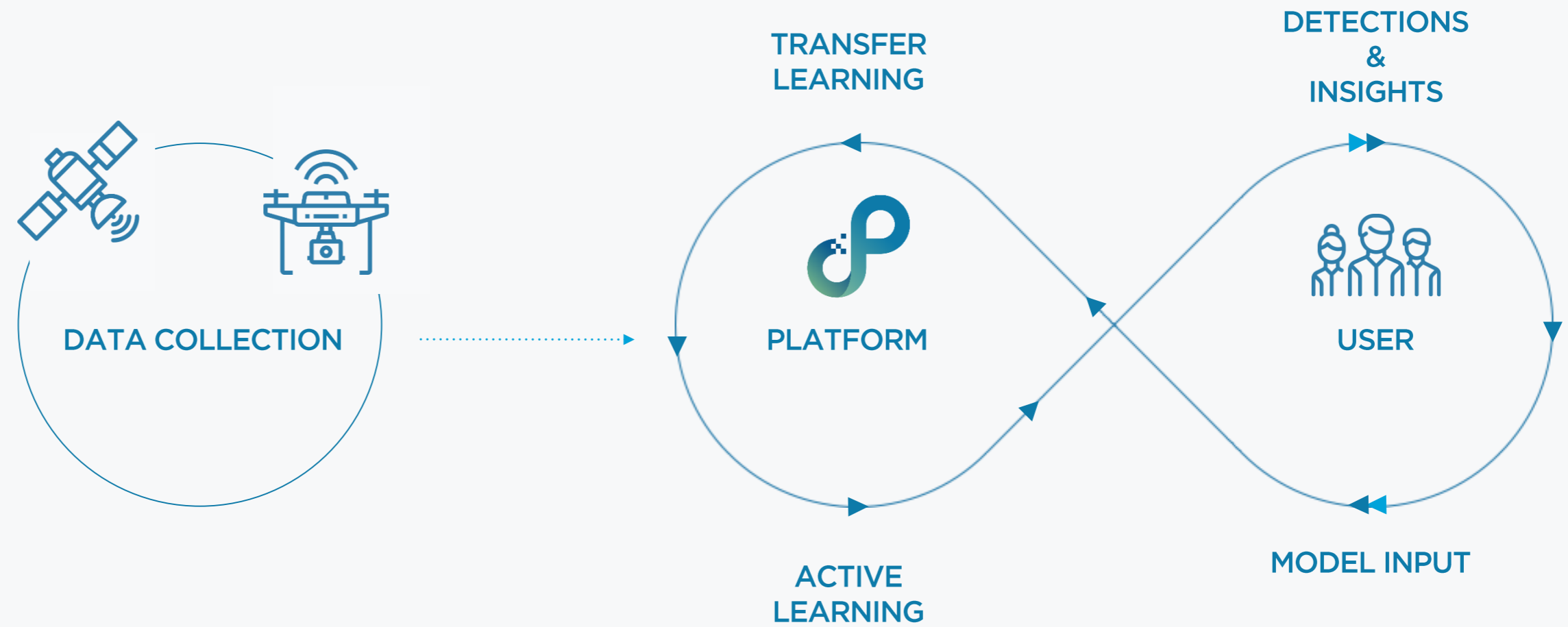






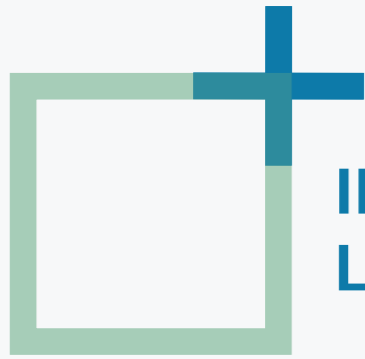


## INTERACTIVE LEARNING



GENERATE CUSTOMIZED  
**GEO-SPATIAL**  
INFORMATION

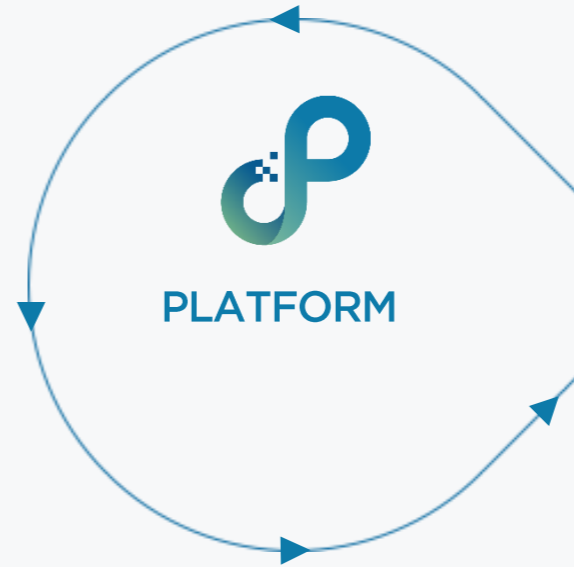




# INTERACTIVE LEARNING

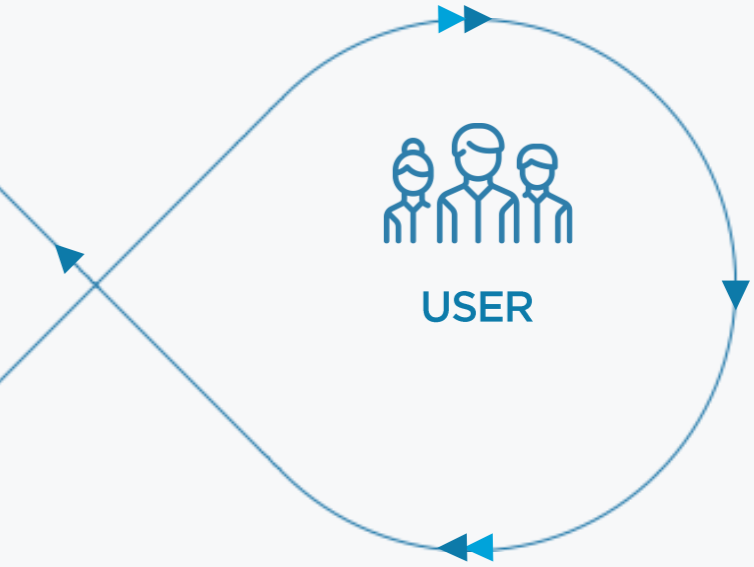


TRANSFER LEARNING

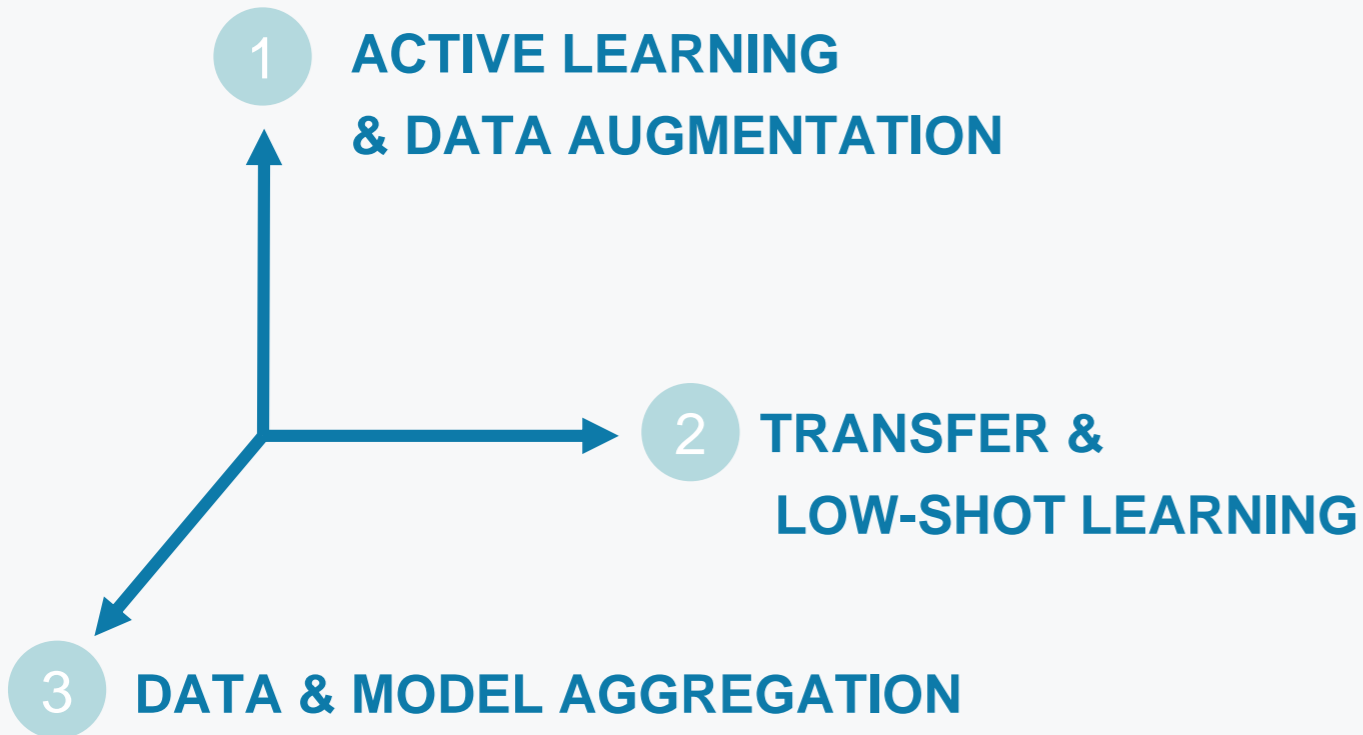


ACTIVE LEARNING

DETECTIONS & INSIGHTS

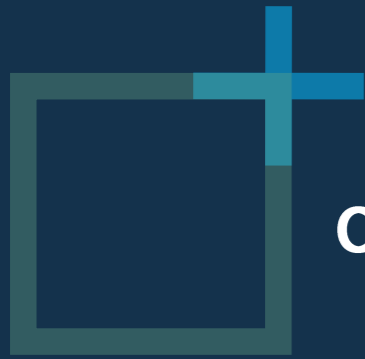


MODEL INPUT



GENERATE CUSTOMIZED  
**GEO-SPATIAL**  
**INFORMATION**





## CONTACT

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 *[/picterra](https://www.linkedin.com/company/picterra)*