

GLOBAL AI STUDENT CONFERENCE

Scaling rivers protection through AI and IoT

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AICONF.EDUCATION



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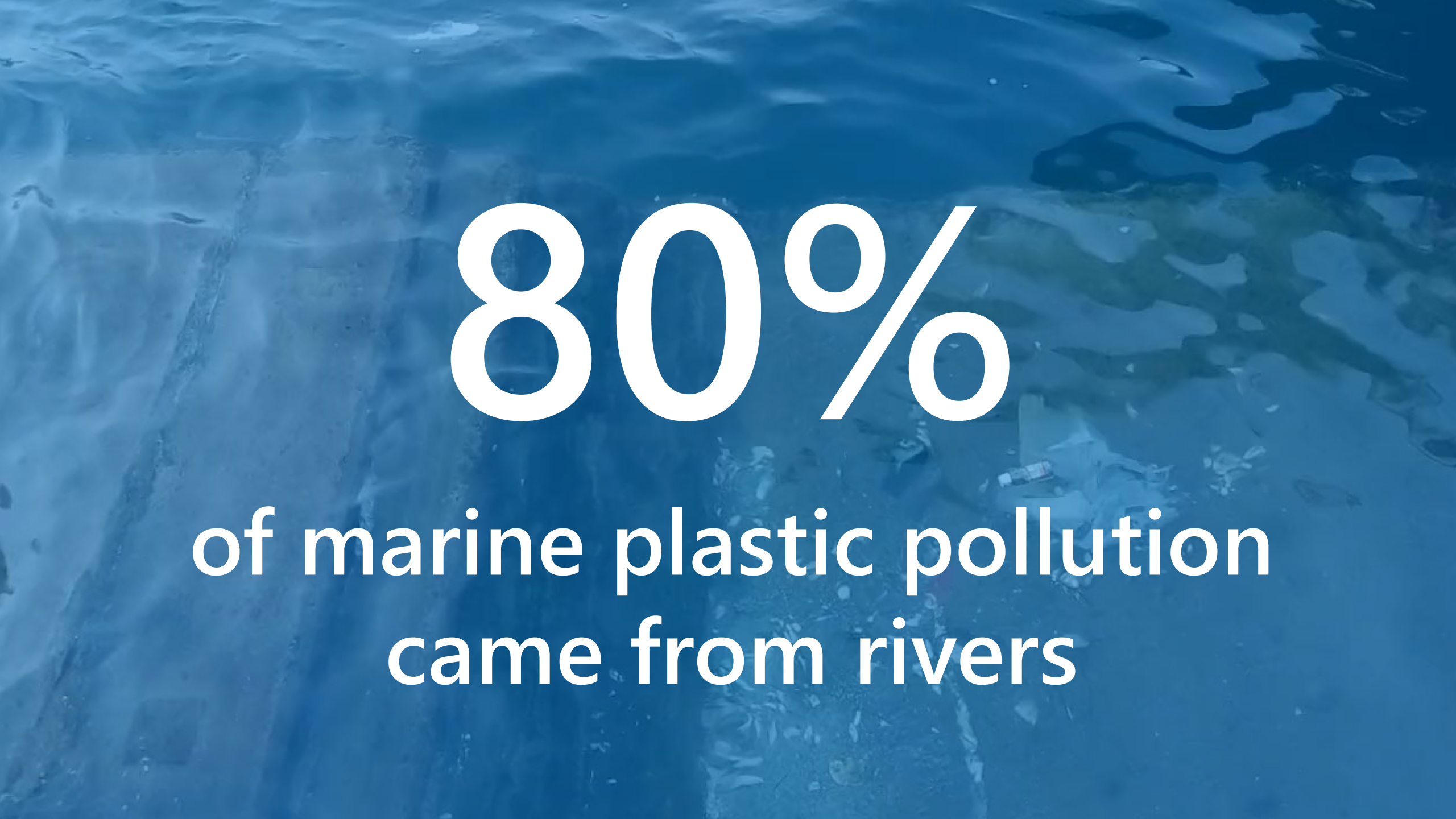




SURFRIDER
FOUNDATION EUROPE





An underwater photograph showing a large amount of plastic waste, including bags and bottles, floating in the water. The scene is dimly lit, with a blueish tint, emphasizing the environmental impact of plastic pollution.

80%

of marine plastic pollution
came from rivers







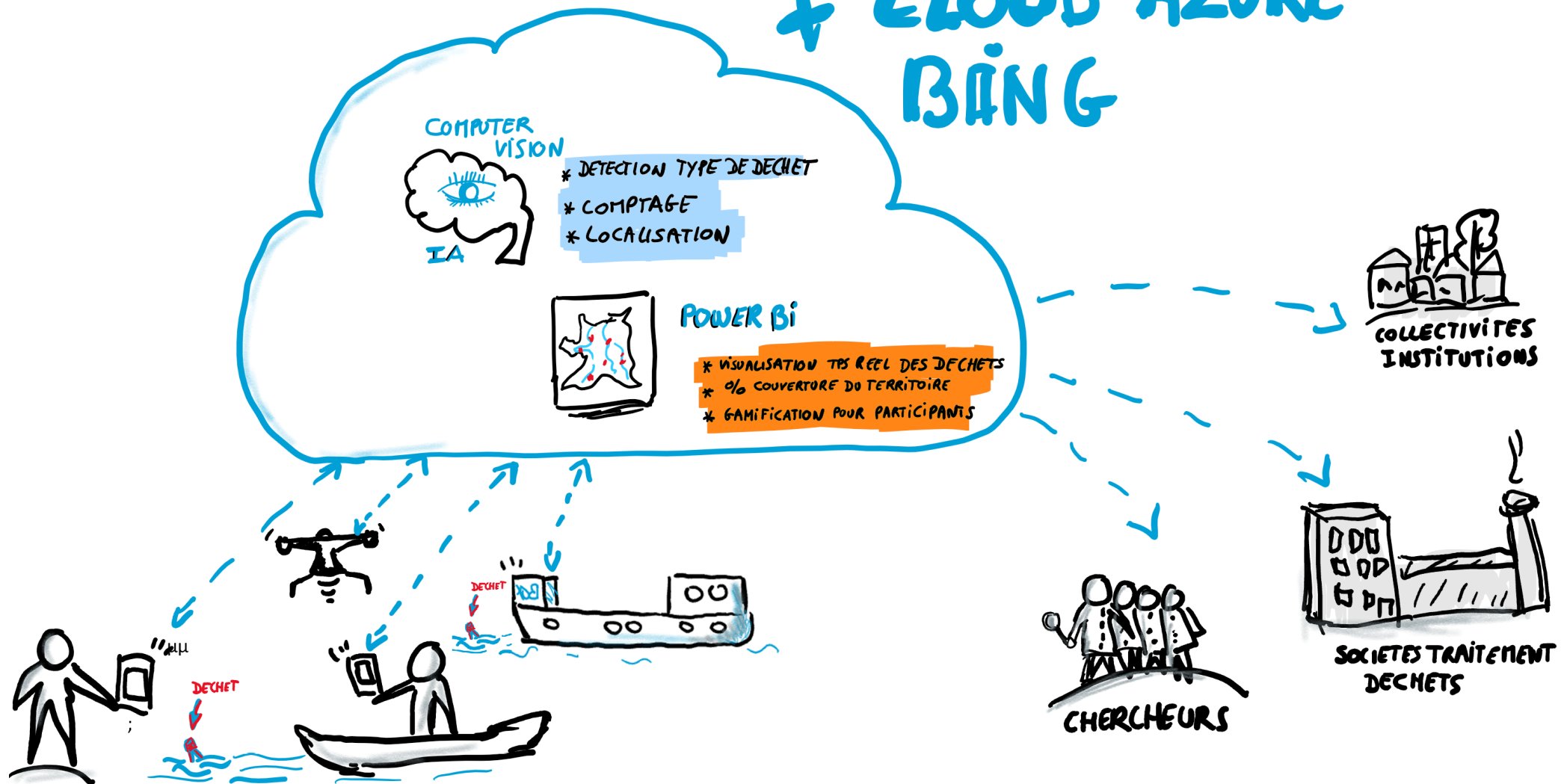


Map 100% of French rivers
in **1 year!**

+157 000 Km



+ CLOUD AZURE BING



Where to start?

A first PoC

Start with nothing

300 unlabelled images

No database

No infrastructure

No Developers / data scientists

No drones

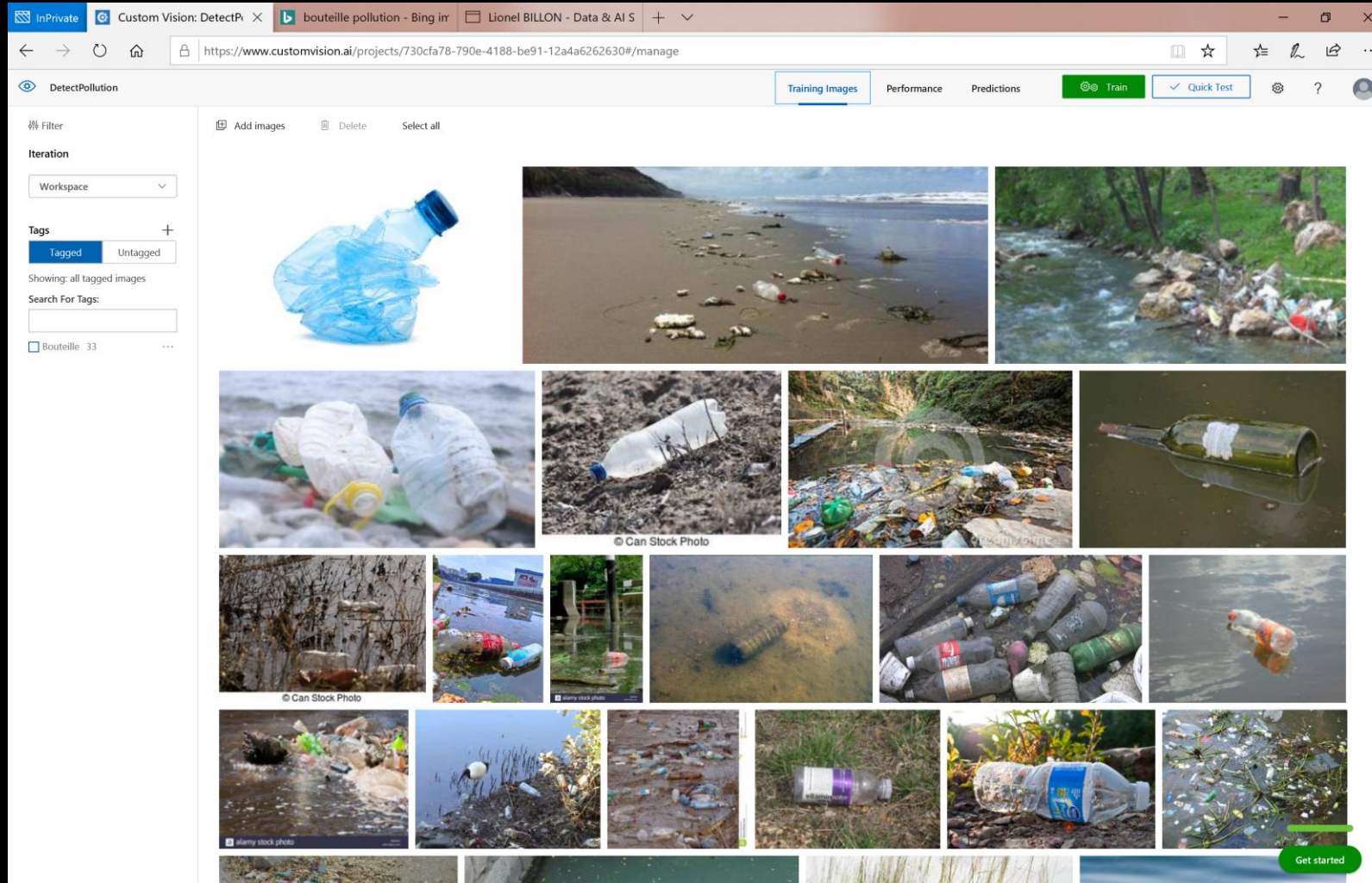
C'est quoi le Machine Learning?

$$f(x) \rightarrow y$$

C'est quoi le Machine Learning?

$$f(\text{img}) \rightarrow \text{dog}$$

Doing AI without knowing anything



Doing AI without knowing anything

Iterations

Probability Threshold: 50%

Overlap Threshold: 30%

Iteration 3
Trained : 9 minutes ago
with General domain

Iteration 2
Trained : 45 minutes ago
with General domain

Iteration 1
Trained : 54 minutes ago
with General domain

Prediction URL

Make default

Delete

Export

Quick Test

Regions Shown



Image URL

Enter Image URL

Browse local files

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Predicted Object Filter

Probability Threshold: 40%

Predictions

Predictions are shown in red

Tag	Probability
Bouteille	95.3%

Doing AI without knowing anything

Custom Vision: DetectPi × pollution plastic bottle water Lionel BILLON - Data & AI S

DetectPollution Training Images Performance Predictions Train Quick Test

Filter Delete

Iteration
Iteration 3

Tags
Showing: all predicted images
Search For Tags:

☐ Bouteille

Sort
☒ Suggested
☐ Newest
☐ Oldest

Quick Test ☒ Regions Shown

Image URL
 →

or

File formats accepted: jpg, png, bmp
File size should not exceed: 4mb

Predicted Object Filter
Probability Threshold: 17% ①

Predictions
Predictions are shown in red

Tag	Probability
Bouteille	85.4%
Bouteille	77.5%
Bouteille	70%
Bouteille	69.4%
Bouteille	52.4%

De l'IA sans rien y connaître...

SurfRider2

Filter

Iteration

Workspace

Tags

Tagged Untagged

Showing: all tagged images

Search For Tags:

baches 44

bouteilles 12

Add images Delete Tag images Select all

Training Images Performance Predictions

SurfRider2

Training Images Performance

Iterations

Prediction URL

Probability Threshold: 50%

Iteration 1

Finished training on 2/21/2019, 2:34:37 PM using General domain

Classification type: Multilabel (Multiple tags per image)

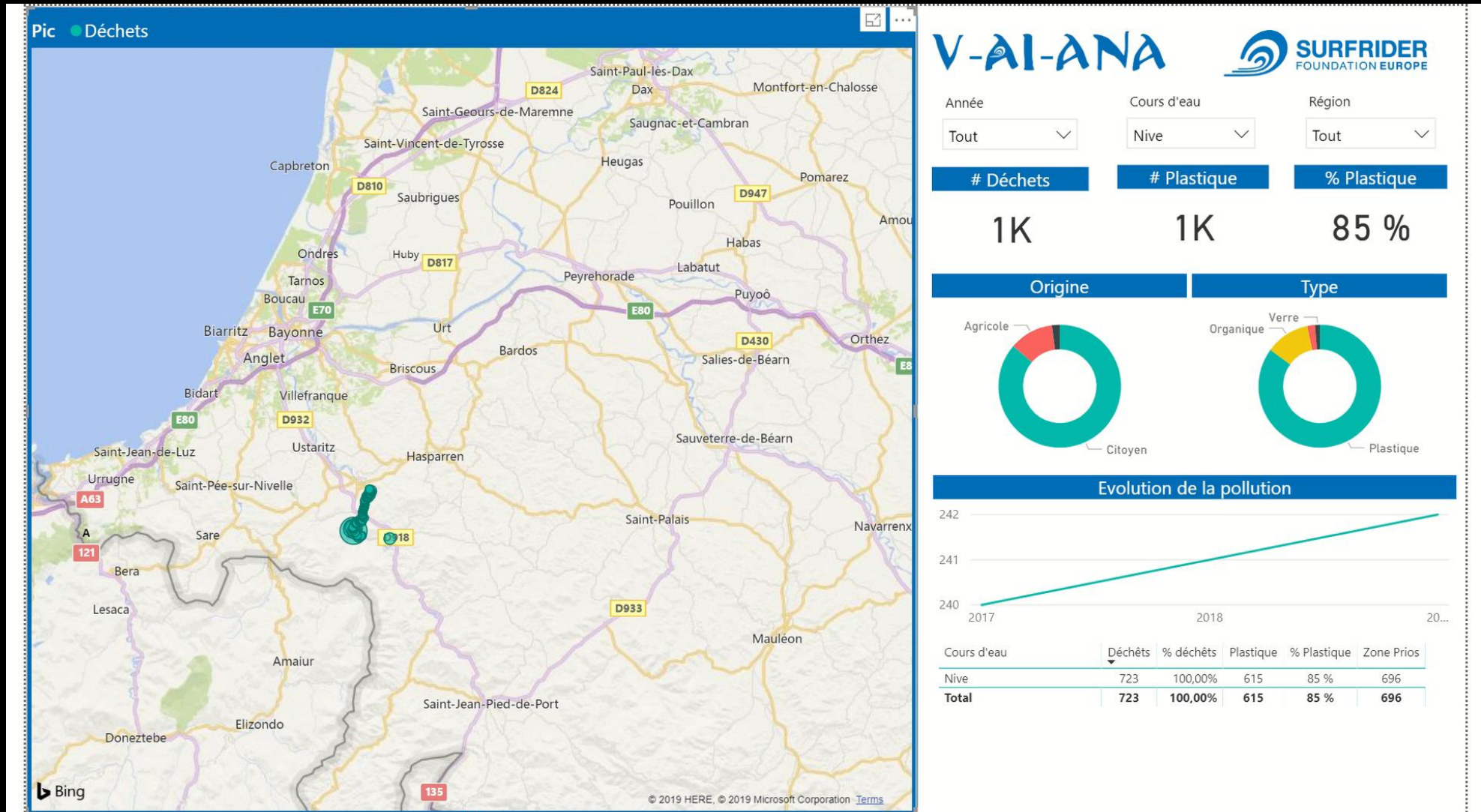
Precision 81.6%

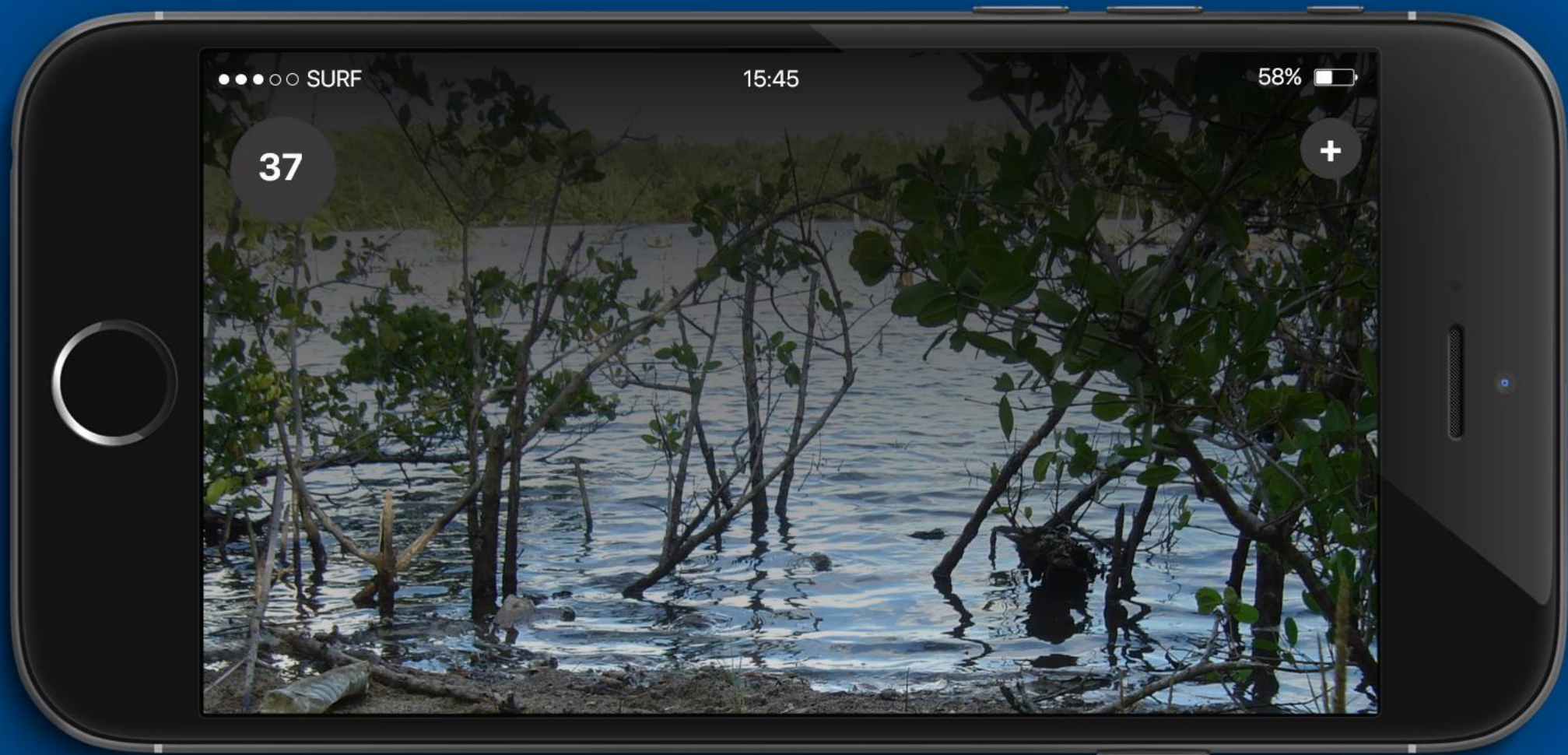
Recall 78.6%

Performance Per Tag

Tag	Precision	Recall	Image count
baches	98.2%	94.7%	56
bouteilles	94.4%	93.3%	12

...and creating a first mapping





Scale

or how to cover the remaining 156 950km



// the work

Create a bigger training dataset

Create a custom AI

Create an open rivers & trash database

Create a mapping service

SURFRIDER V-TEAM

Une équipe pluridisciplinaire

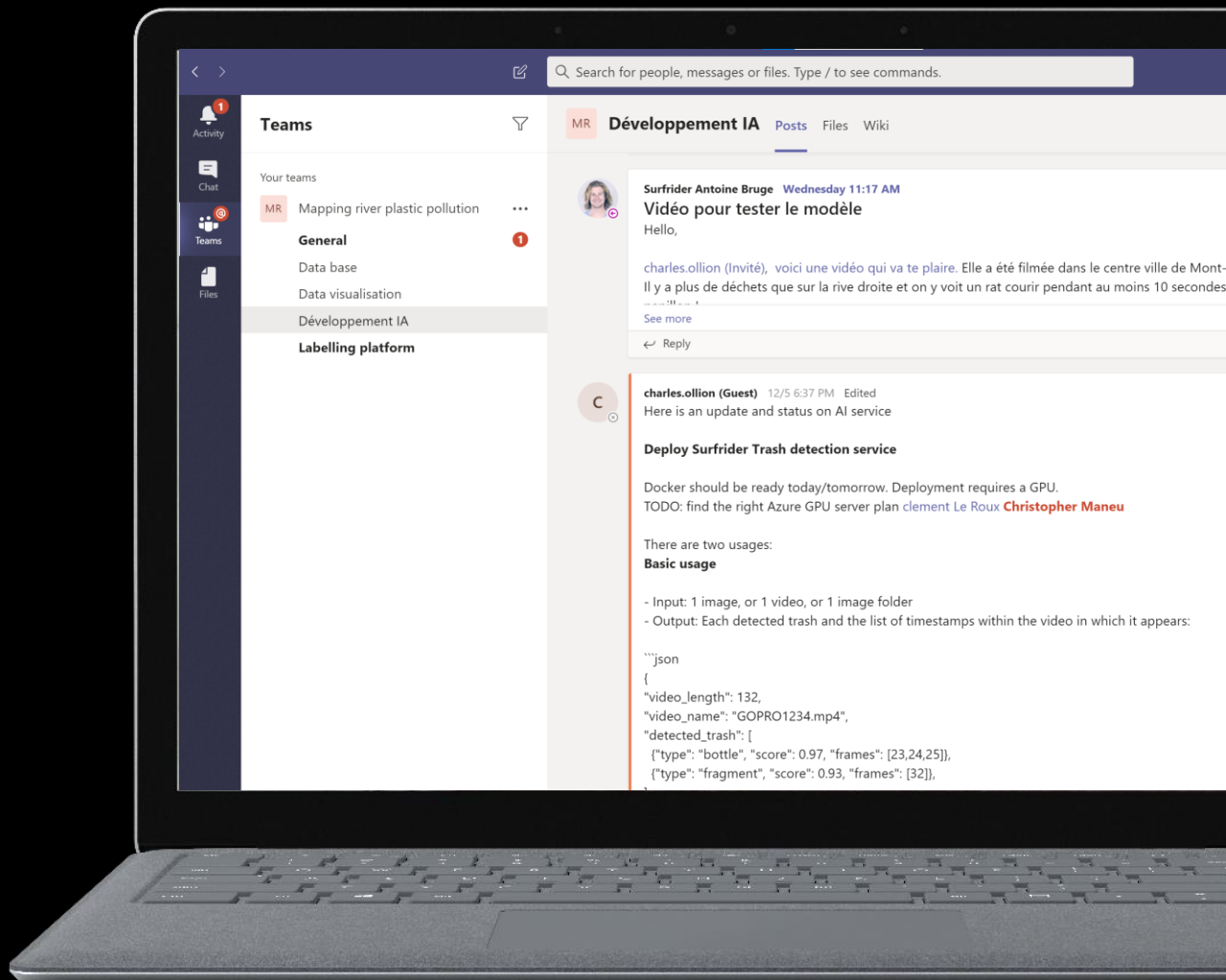
Surfrider

IA Microsoft / Simplon School

Heuritech / Azeo / ...

Volunteers

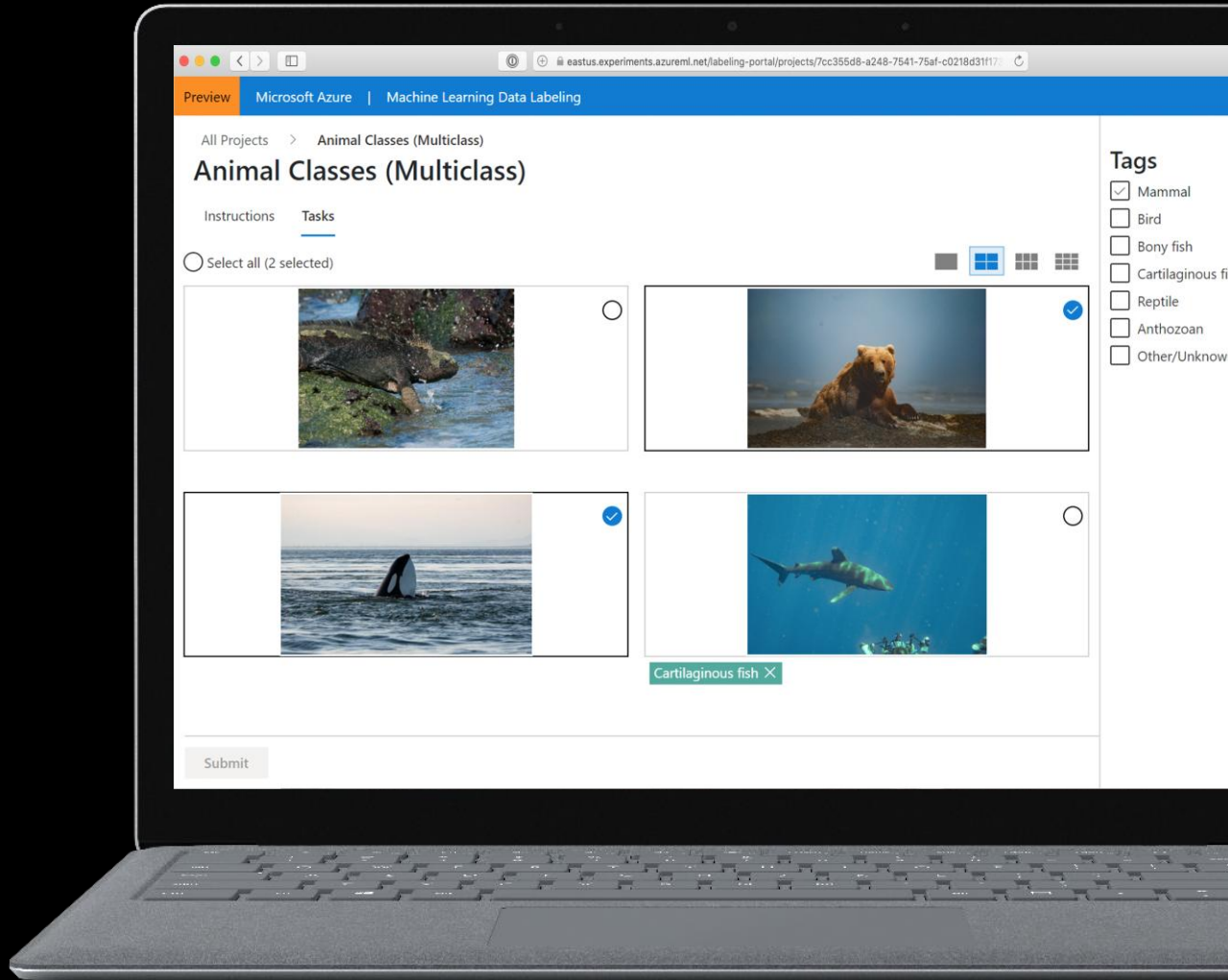
Microsoft



Label dataset

Custom solution

Azure Machine Learning Data Labeling



FUTURE

A “rider-box”

Local AI Execution

Model trained in Azure Cloud

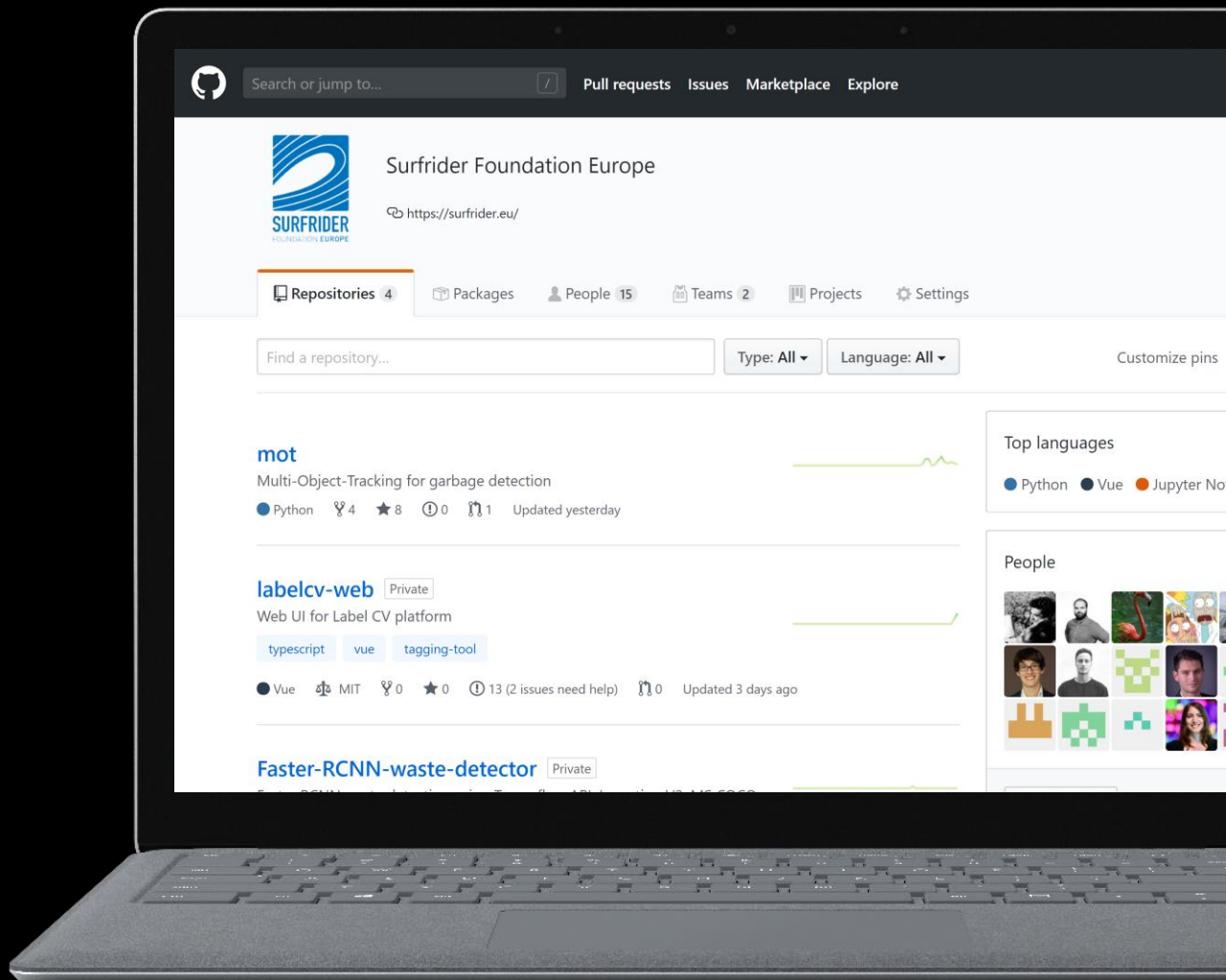
All rider boxes are managed by Azure IoT



OPENSOURCE

Follow the project

<https://github.com/surfriderfoundationeurope>



How to start your IoT Projects?

TAKEAWAYS

Microsoft Learn IoT

<https://aka.ms/learn-iot>

Intelligent video analytics at the edge

<https://github.com/toolboc/Intelligent-Video-Analytics-with-NVIDIA-Jetson-and-Microsoft-Azure>

Get the slides

<https://aka.ms/chris/slides>





Thanks!

Q&A