



 **ezako**
time series solutions

Ezako

L'entreprise

Startup basée à Paris et Sophia-Antipolis

L'activité

Séries temporelles, spectrogrammes, audio

Big Data & IA

Industries

Défense, Automotive, Télécom, Energie...



L'expérience d'Ezako avec le CNES

Expériences avec le CNES

R&T

- Amélioration de la détection d'anomalies dans la télémétrie satellite par machine learning

Nostradamus

- Performance assessment of NOSTRADAMUS & other machine learning-based telemetry monitoring systems on a spacecraft anomalies database, (Fuertes et al., 2018)
- Improving Spacecraft Health Monitoring with Automatic Anomaly Detection Techniques, (Fuertes et al., 2016)

ESA-BIC

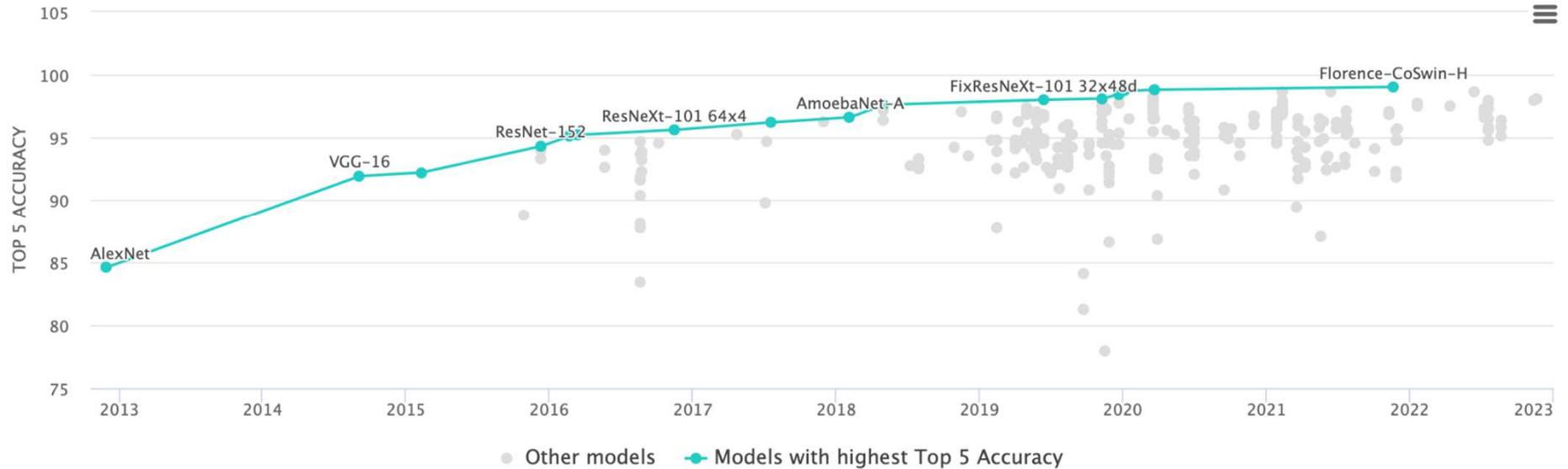


**business
incubation
centre**
Sud France



Labelliser, l'axe clé d'amélioration de vos IA

Précision des algorithmes de classification d'images - Etat de l'Art



Nos leviers: dataset en entrée et les processus d'optimisation

<https://paperswithcode.com/sota/image-classification-on-imagenet>



Pourquoi labelliser?

Avantages du non supervisé:

Détection d'événements nouveaux

Pas de nécessité de dataset équilibré : "On a pas d'anomalies dans notre historique"

Principalement une activité de data science

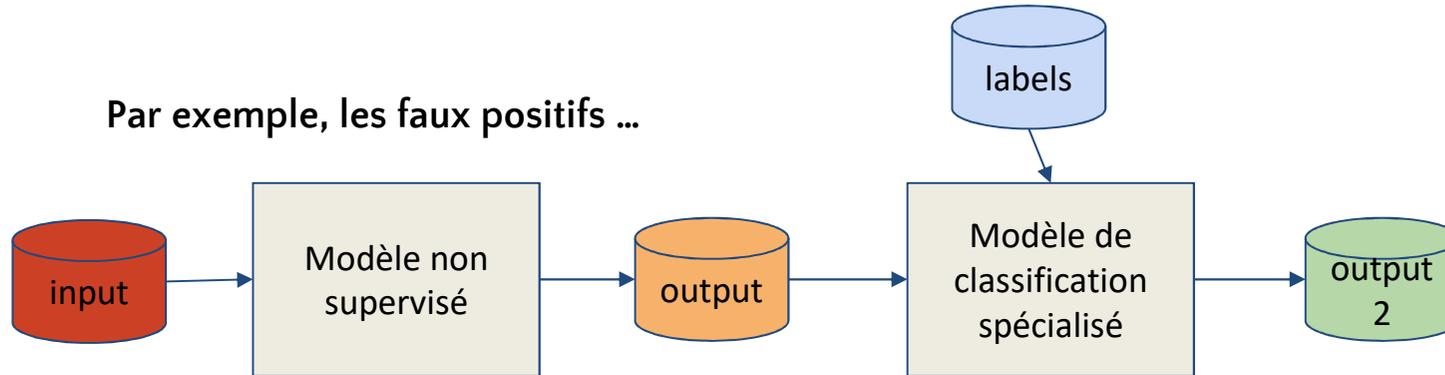
Limitations:

Précision nettement inférieure au supervisé

Faible contrôle sur la prédiction: choix des descripteurs, des seuils

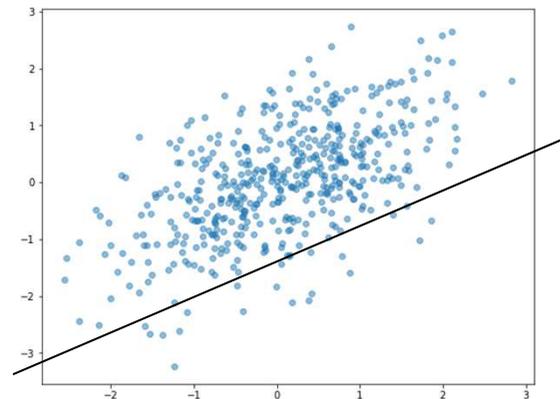
Quelques labels ont un impact énorme

Par exemple, les faux positifs ...

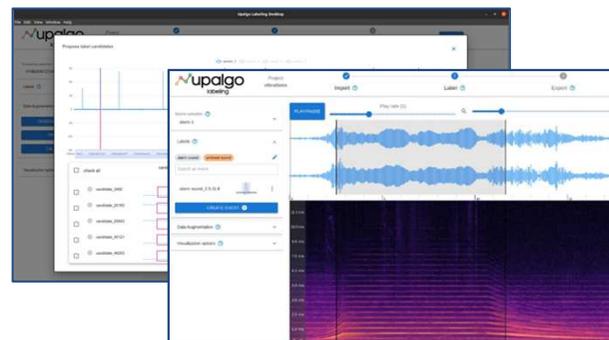


... sont souvent des clusters difficiles à isoler en non-supervisé,

Mais facile à classifier avec quelques labels!



Les solutions Ezako



Synthetic Data



Mais labelliser est complexe ...

Label	Time	Node 1	Node 2
	12.3	-2.55E-06	-1.79E-06
	12.4	-3.52E-06	-5.58E-07
	12.5	-4.62E-06	8.61E-07
	12.6	-5.87E-06	2.46E-06
	12.7	-7.19E-06	4.19E-06
	12.8	-8.53E-06	5.95E-06
	12.9	-9.76E-06	7.59E-06
	13	-1.08E-05	8.97E-06
	13.1	-1.14E-05	9.95E-06
	13.2	-1.17E-05	1.04E-05

Long

Coûteux

Fastidieux

Non valorisant

Erreur prone

Labellisation manuelle

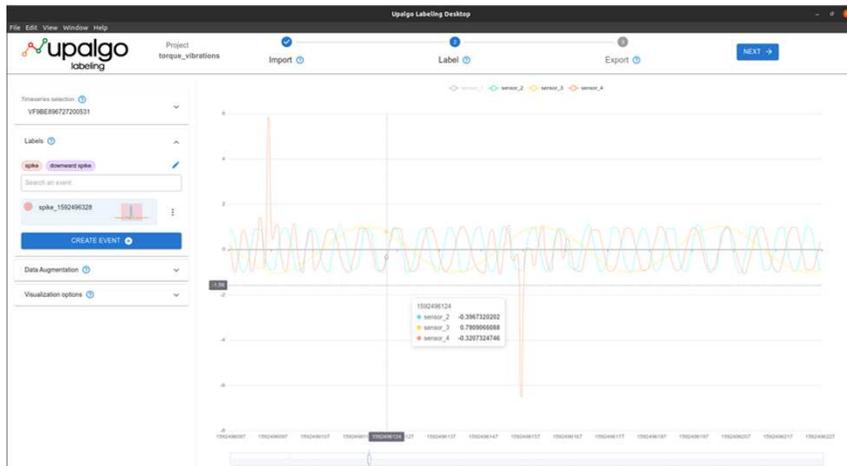
Label	Time	Node 1	Node 2
	12.3	-2.55E-06	-1.79E-06
	12.4	-3.52E-06	-5.58E-07
	12.5	-4.62E-06	8.61E-07
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	13.2	-1.17E-05	1.04E-05



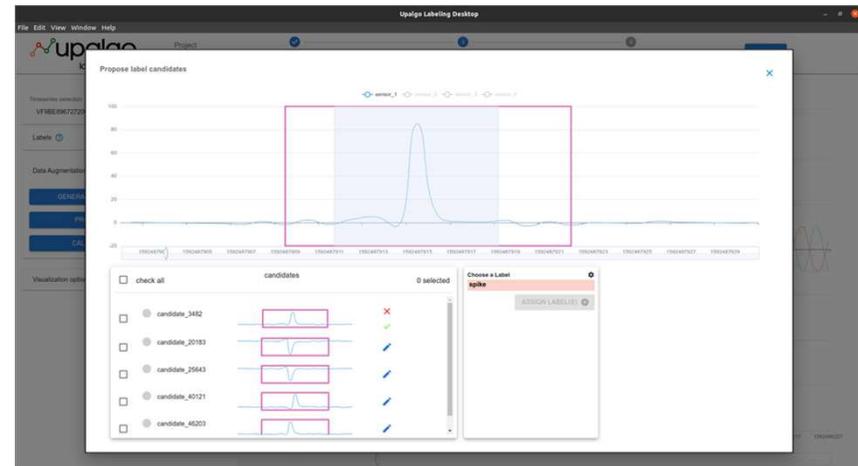
Label	Time	Node 1	Node 2
0	12.3	-2.55E-06	-1.79E-06
0	12.4	-3.52E-06	-5.58E-07
1	12.5	-4.62E-06	8.61E-07
1	12.6	-5.87E-06	2.46E-06
1	12.7	-7.19E-06	4.19E-06
0	12.8	-8.53E-06	5.95E-06
0	12.9	-9.76E-06	7.59E-06
0	13	-1.08E-05	8.97E-06
0	13.1	-1.14E-05	9.95E-06
0	13.2	-1.17E-05	1.04E-05

Upalgo Labeling résout ce problème!

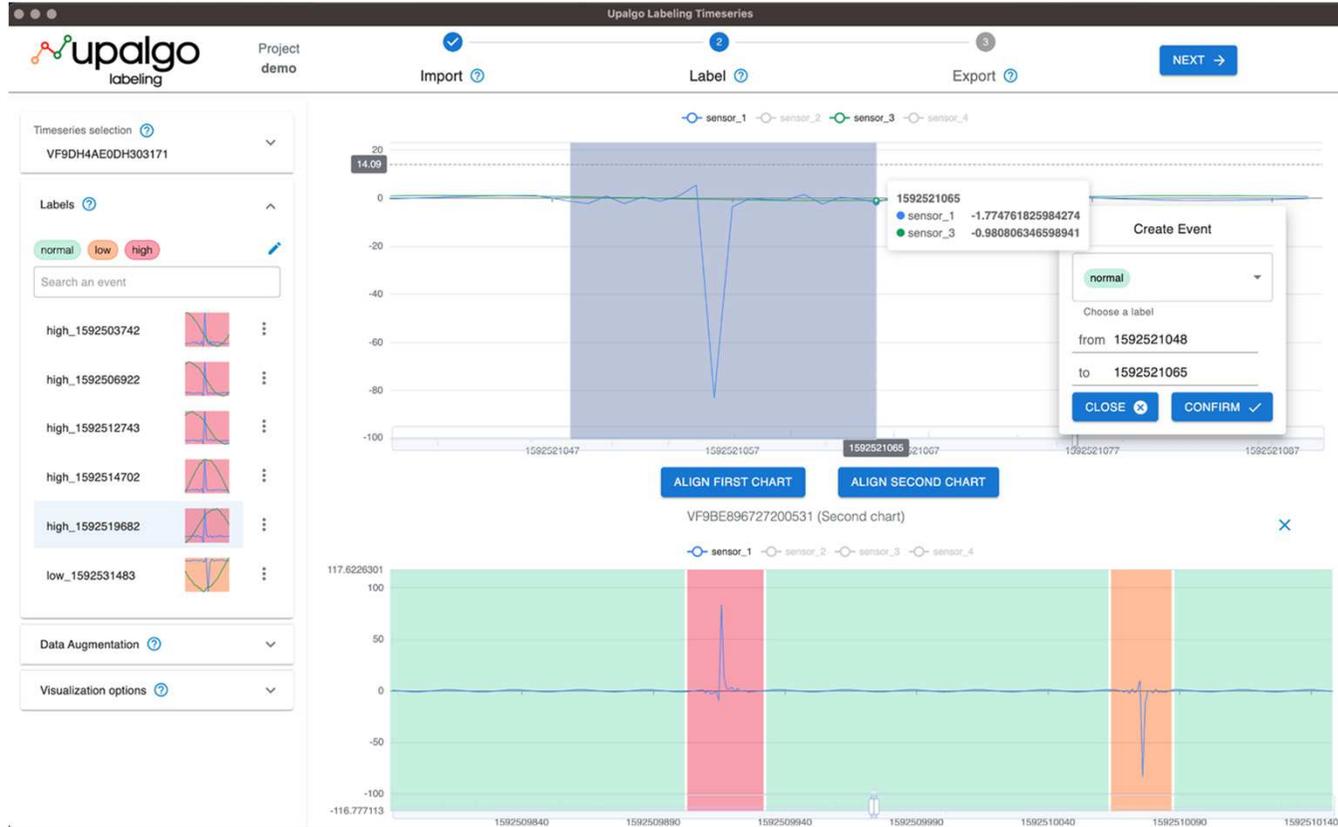
Ergonomie



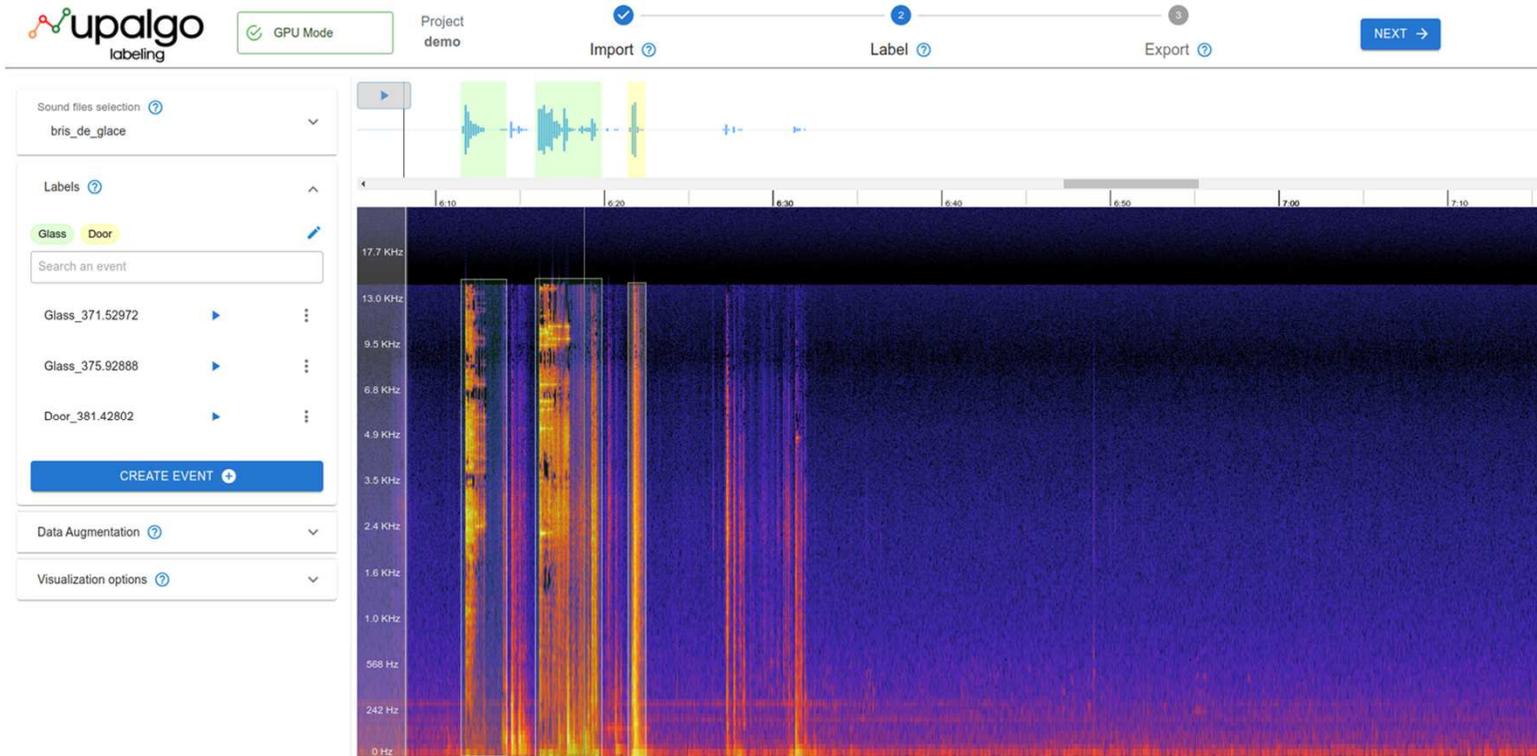
Assister avec de l'IA



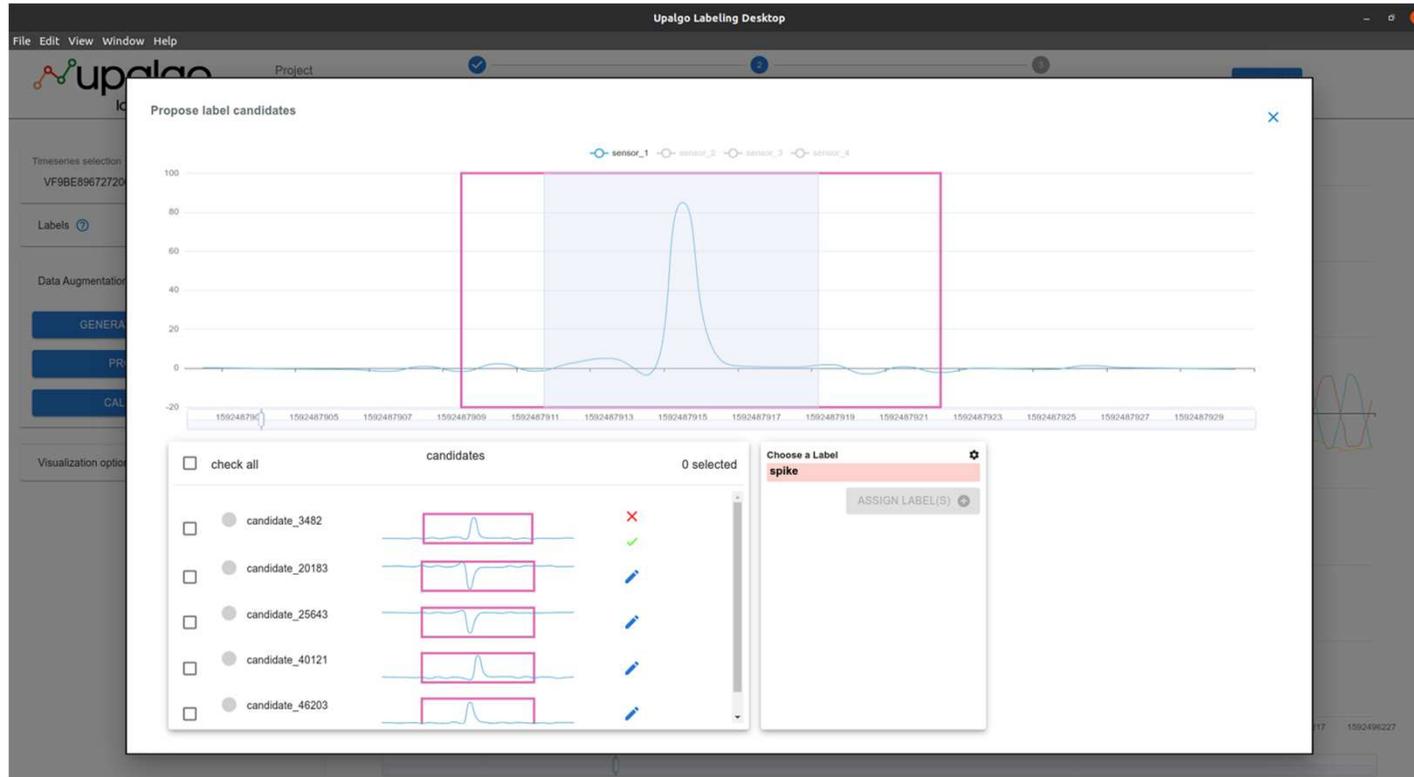
Faciliter la labellisation



Présenter les données pour la labellisation



L'IA pour assister la labellisation



Recherche de pattern

The screenshot shows the 'Upalgo Labeling Timeseries' application interface. The main window is titled 'Search similar patterns' and displays a waveform for 'Pattern 2458'. The waveform is a blue signal with a pink box highlighting a specific segment. Below the waveform, there is a list of similar patterns with their respective scores and labels.

Displayed Timeseries: subject_5.csv

acc_chest_x - acc_chest_y - acc_chest_z - ele_signal_1 - ele_signal_2 - acc_left_ankle_x - acc_left_ankle_y - acc_left_ankle_z - gyro_left_ankle_x - gyro_left_ankle_y - gyro_left_ankle_z

Similar patterns

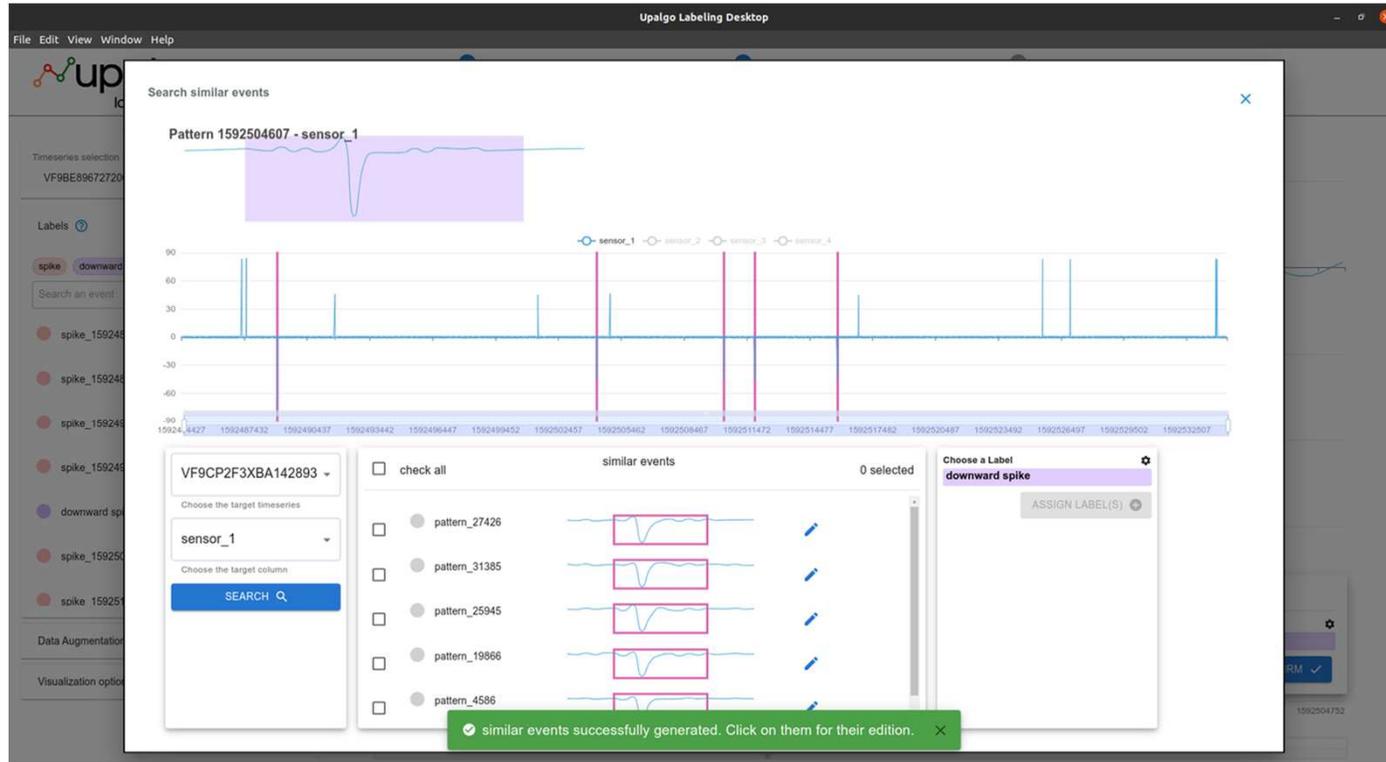
Check	Pattern ID	Score	Label	Actions
<input type="checkbox"/>	27998-32525_subject_3...	87%		✎ ✕
<input type="checkbox"/>	25039-28110_subject_5...	83%		✎ ✕
<input type="checkbox"/>	2206-5273_subject_5.csv	81%		✎ ✕
<input type="checkbox"/>	18434-21501_subject_9...	78%		✎ ✕
<input type="checkbox"/>	6145-9213_subject_9.csv	78%		✎ ✕

Running

Choose a label

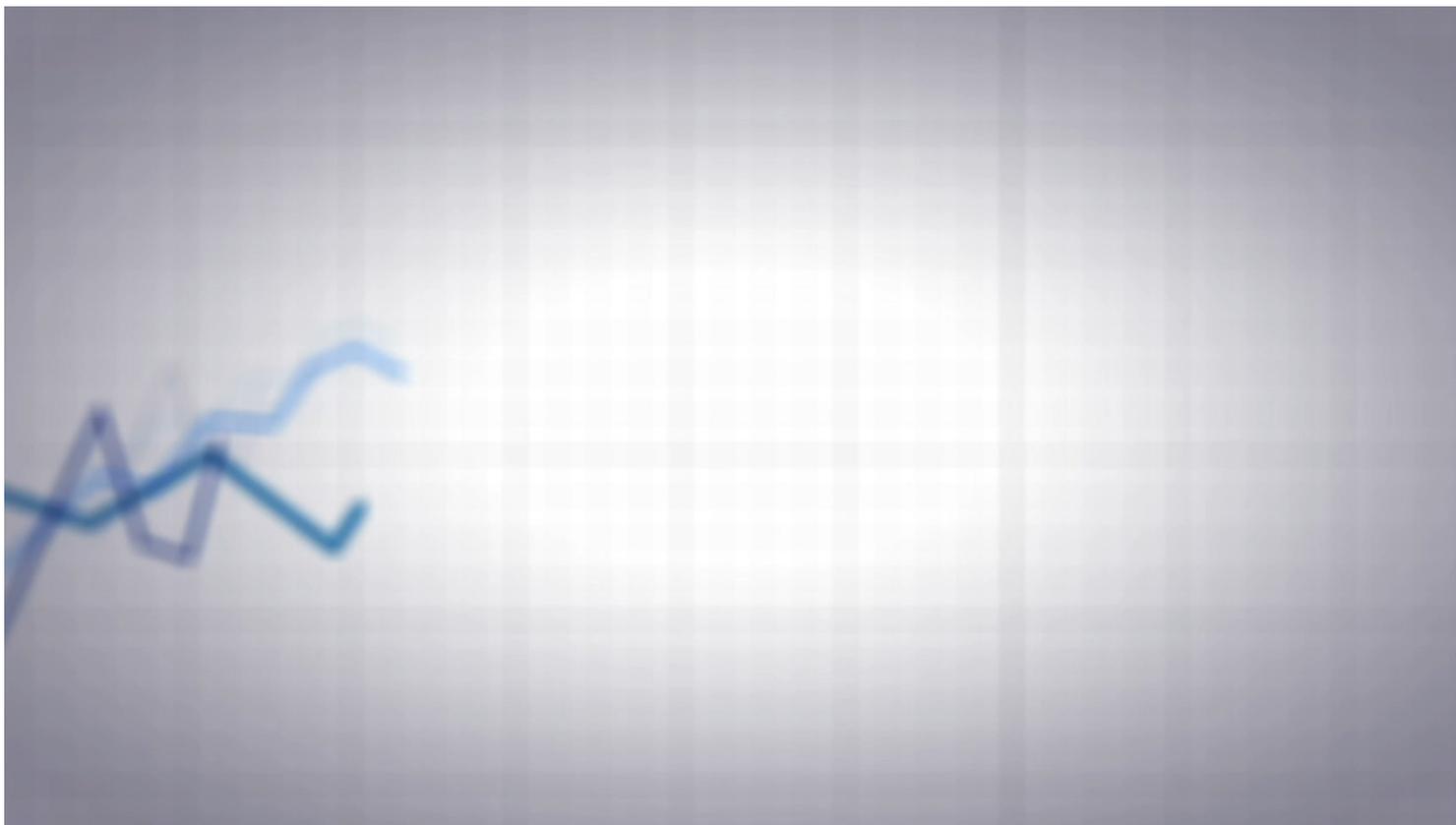
ASSIGN LABEL(S)

La propagation de labels dans Upalgo Labeling



The screenshot shows the Upalgo Labeling Desktop application interface. A "Search similar events" dialog box is open, displaying a waveform for "Pattern 1592504607 - sensor_1" with a purple highlight. Below the waveform is a time-series plot showing multiple sensors (sensor_1, sensor_2, sensor_3, sensor_4) over time. The dialog includes a search bar with the ID "VF9CP2F3XBA142893", a dropdown for "sensor_1", and a "SEARCH" button. A list of similar events is shown, including "pattern_27426", "pattern_31385", "pattern_25945", "pattern_19866", and "pattern_4586". A "Choose a Label" dropdown is set to "downward spike", and an "ASSIGN LABEL(S)" button is visible. A green notification bar at the bottom states: "similar events successfully generated. Click on them for their edition."

Upalgo Labeling démo





Julien Muller
+33 65 06 64 66
julien.muller@ezako.com