



PROPHESSEE

METAVISION FOR MACHINES

SOLUTIONS

MACHINE LEARNING

DETECTION INFERENCE

NEW

DETECTION TRAINING

NEW

EVENT SIMULATOR

NEW

DETECTION KPI

NEW

OPTICAL FLOW INFERENCE

NEW

OPTICAL FLOW TRAINING

ANALYTICS

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OBJECT TRACKING

VIBRATION MONITORING

SPATTER MONITORING

HIGH-SPEED COUNTING

CALIBRATION

CALIBRATION

COMPUTER VISION 3D

NEW

EDGELET TRACKING

COMPUTER VISION

OPTICAL FLOW

CORE

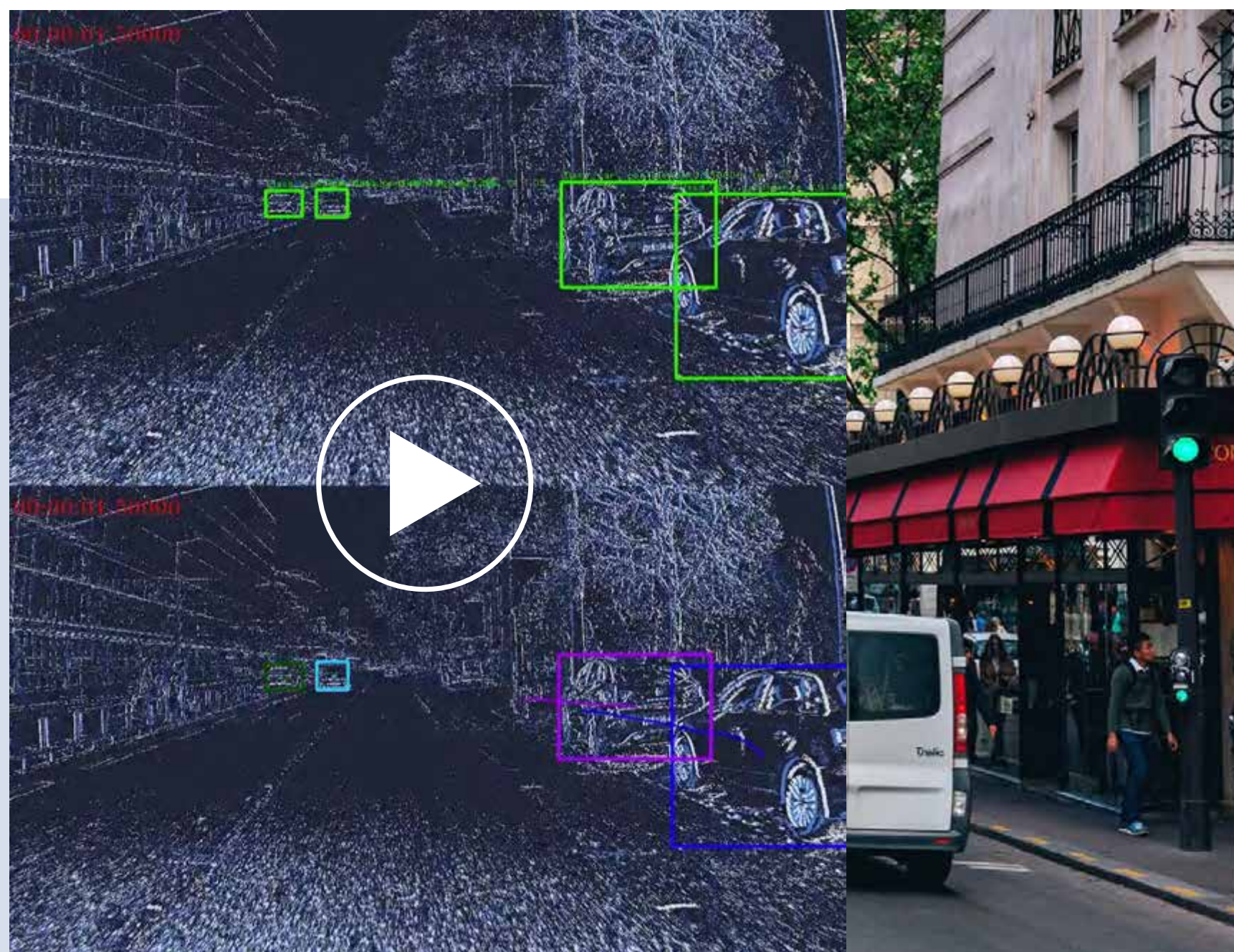
ULTRA SLOW MOTION

XYT VISUALIZATION

DATA RATE VISUALIZATION



MACHINE LEARNING - *DETECTION INFERENC*



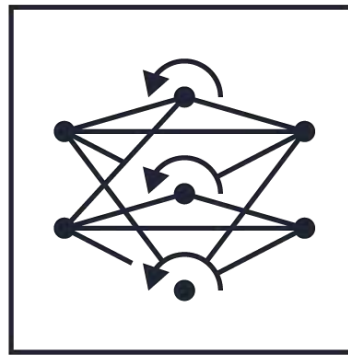
Unlock the potential of Event-Based machine learning, with a set of dedicated tools providing everything you need to start execution of Deep Neural Network (DNN) with events.

Leverage our pretrained automotive model written in pytorch, and experiment live detection & tracking using our c++ pipeline. Use our comprehensive python library to design your own networks.

Pretrained network trained on a 15h and 25M labels automotive dataset

Live detection and tracking **@100Hz**

NEW



DETECTION
TRAINING

PROFESSIONAL

MACHINE
LEARNING

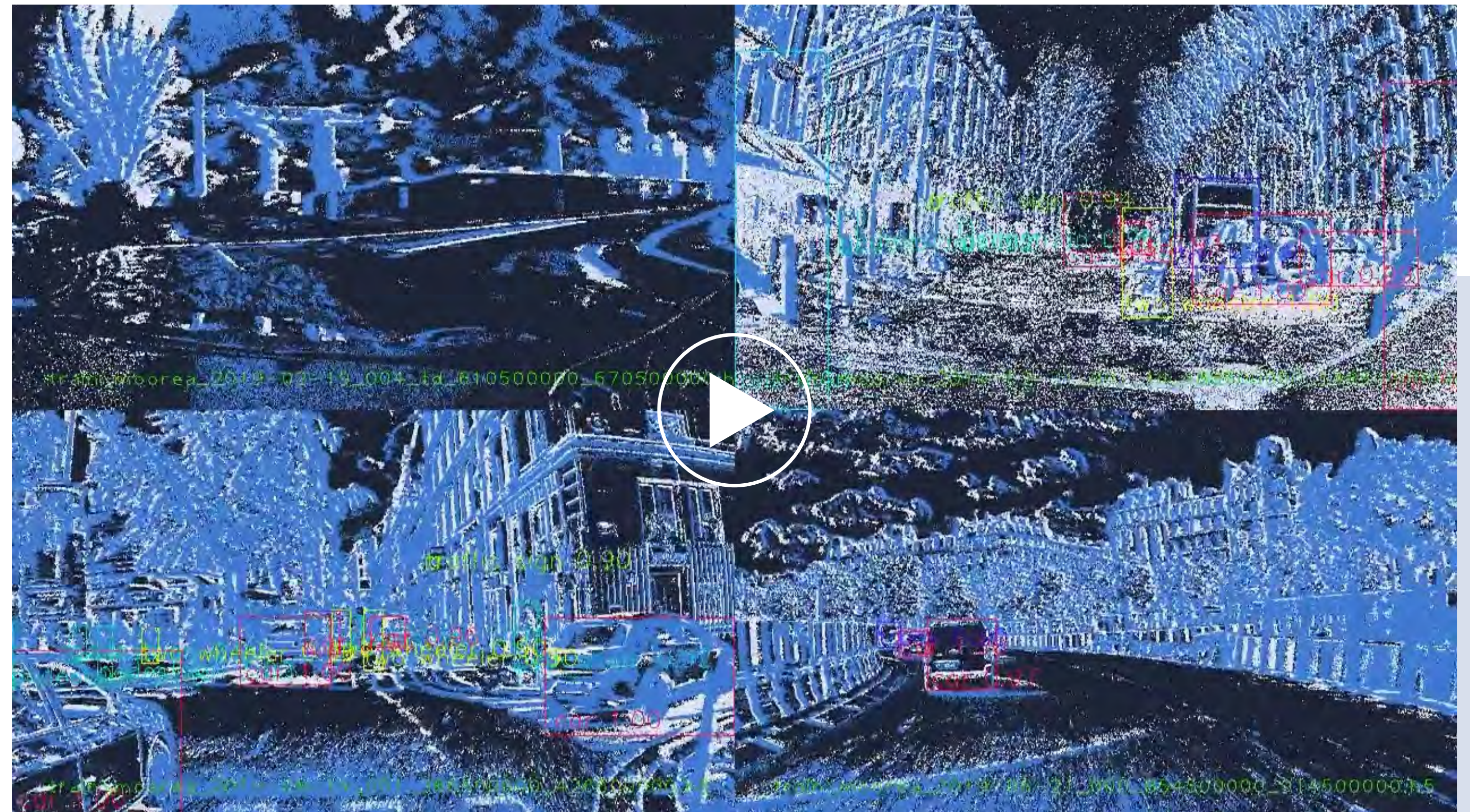
MACHINE LEARNING - *DETECTION TRAINING*

Train your own Object Detection application with our ready-to use training framework. Explore Event-Based Tensor representation, and train network topology suited for event-based Data

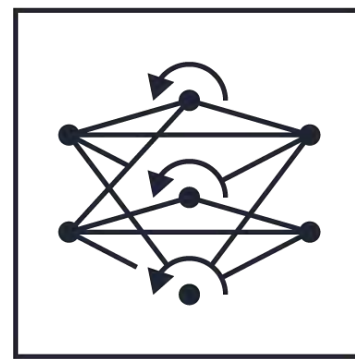
4 pre-built tensor representation (binary frame, histogram, time surface, event cube)

Automated HDF5 dataset generation

Comprehensive training toolbox, including pretrained network, dataset, and more



NEW



SIMULATOR

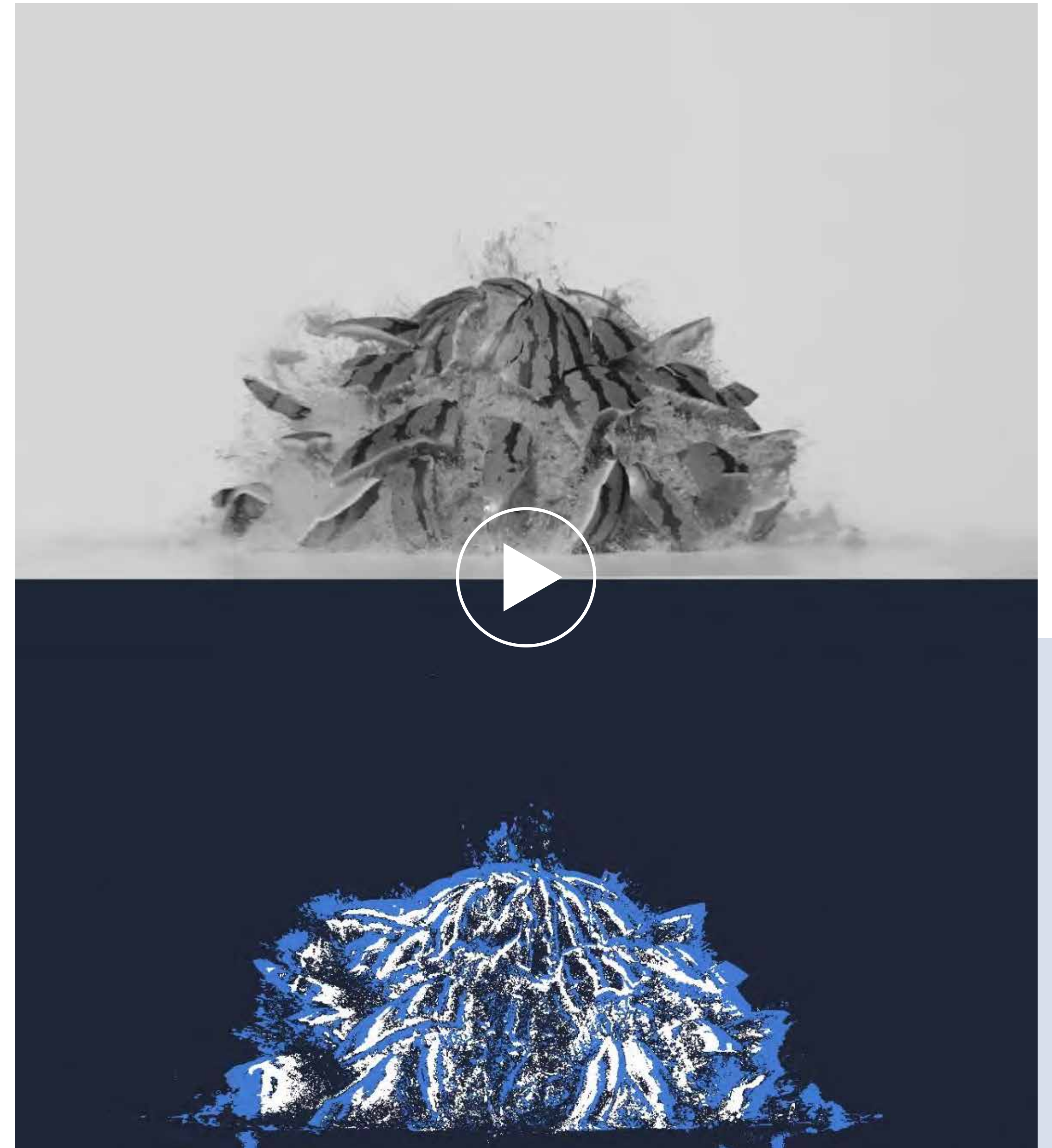
PROFESSIONAL

MACHINE
LEARNING

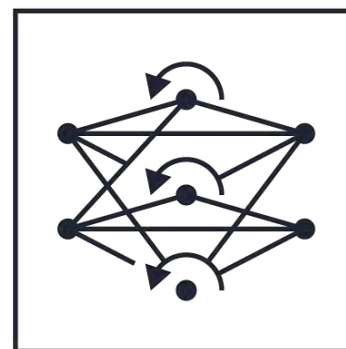
EVENT SIMULATOR

Bridge frame-based and event-based worlds with our events- simulator.
Generate synthetic data to augment your dataset, and partially reuse existing references.

Off the shelf, ready to use Event simulator



NEW



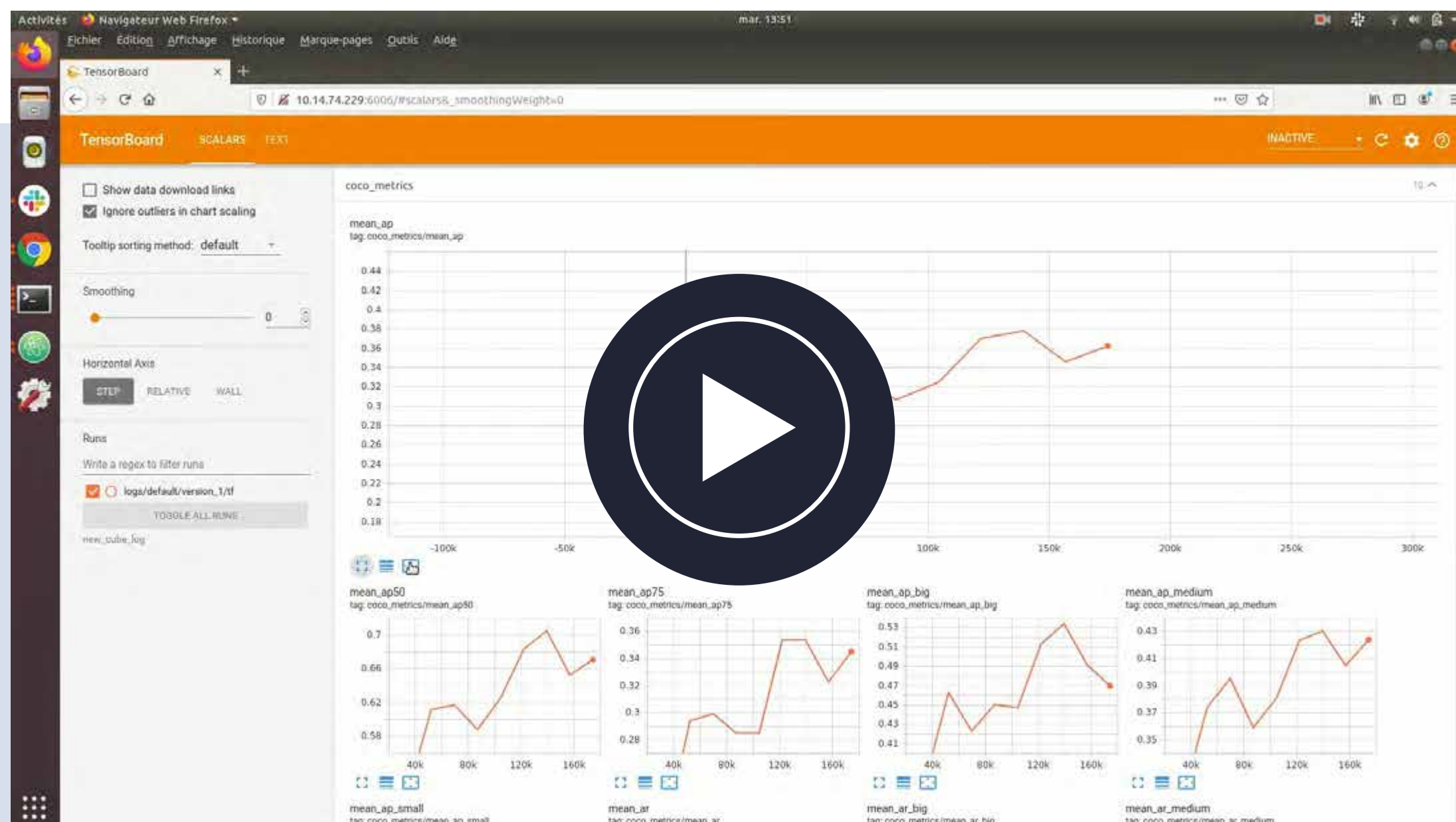
DETECTION
KPI

MACHINE
LEARNING

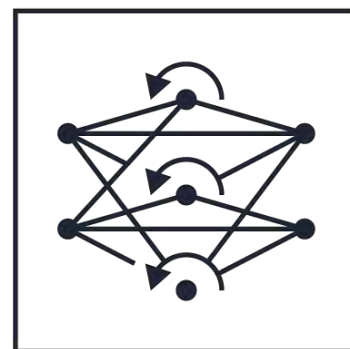
MACHINE LEARNING - *DETECTION KPI*

Evaluate your detection performance with our Object Detection KPI toolkit in line with the latest COCO API.

mAP, mAR and their variants included



NEW

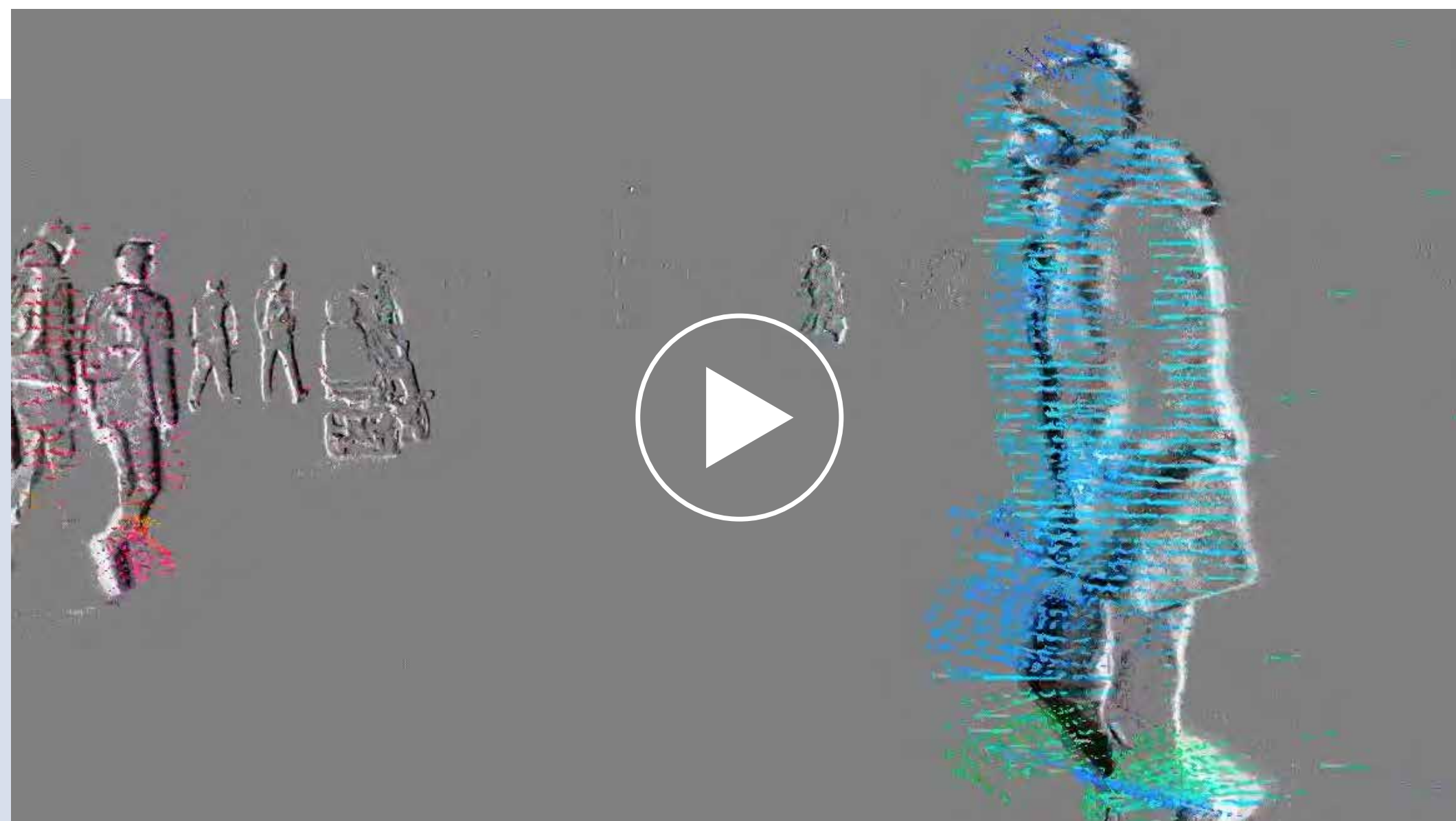


OPTICAL FLOW
INFERENCE

PROFESSIONAL

MACHINE
LEARNING

MACHINE LEARNING - *OPTICAL FLOW INFERENCE*

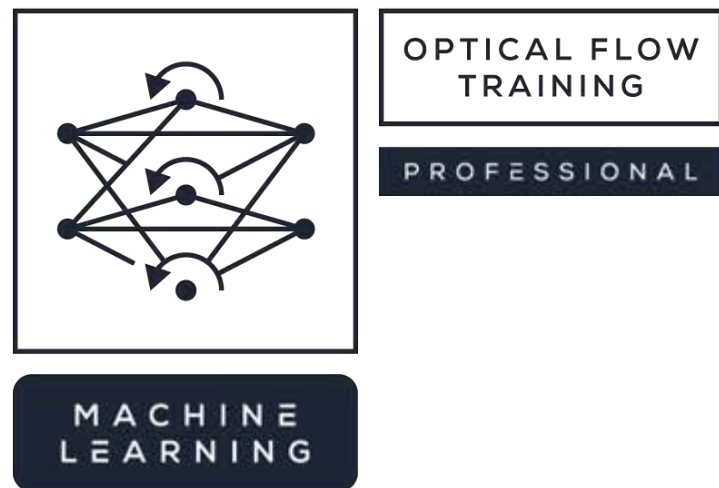


Predict optical flow from Event-Based data leveraging our pretrained Flow Model, customized data loader and collections of loss function and visualization tools to set up your flow inference pipeline.

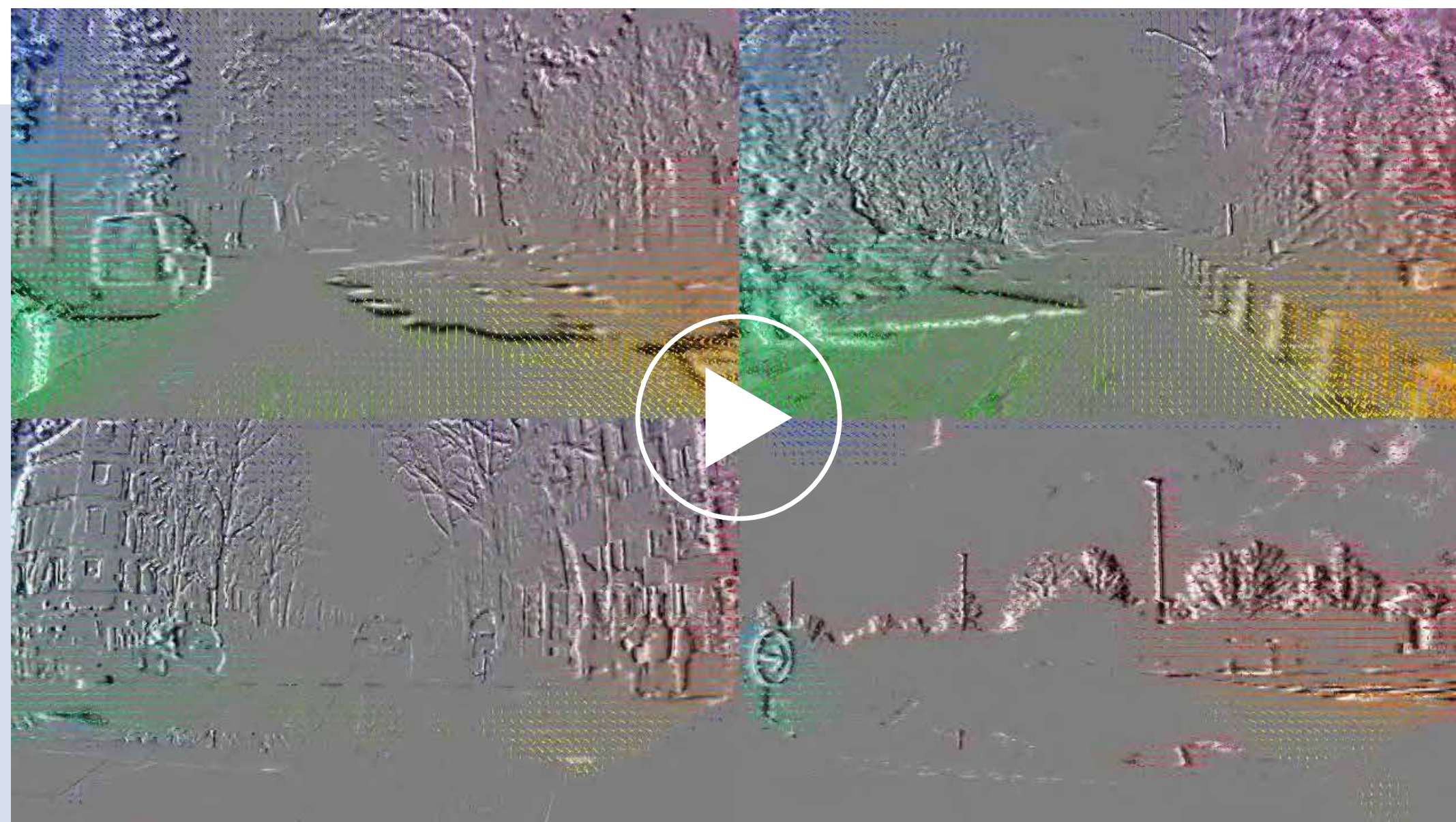
Self-supervised Flownet architectures

Lightweight model

NEW



MACHINE LEARNING - *OPTICAL FLOW TRAINING*

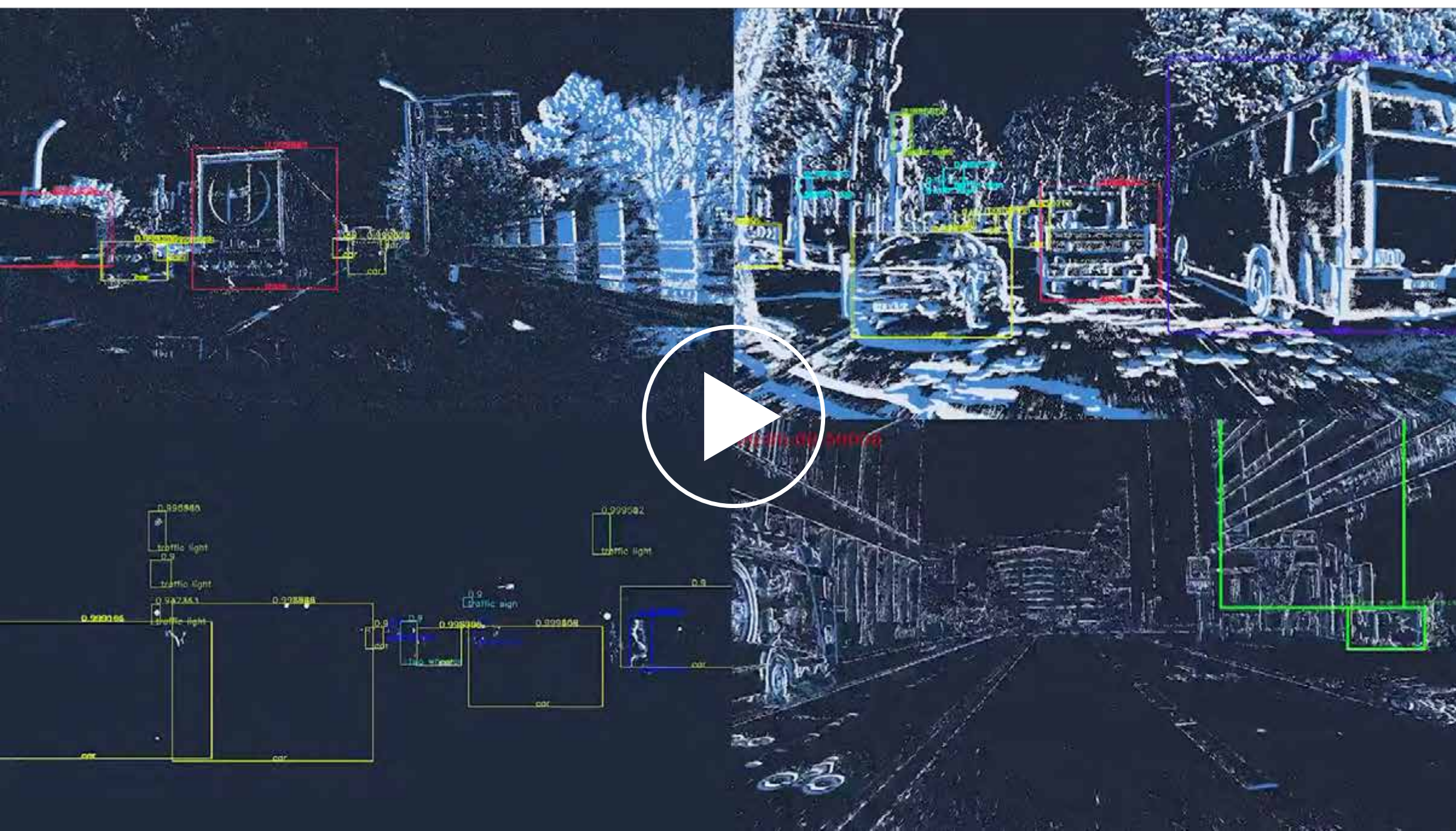


No ground truth? Leverage our self-supervised architecture. Train your Optical Flow application with our custom-built FlowNet training framework. Experiment with 4 pre-built Flow Networks tailor-made for your Event-based data.

Comprehensive flow training toolbox, including different network topologies, various loss functions and visualization mode



MACHINE LEARNING – *LARGEST EVENT-BASED VISION DATASET*



Our model, spotlighted at NeurIPS, outperforms by a large margin feed-forward event-based architectures.

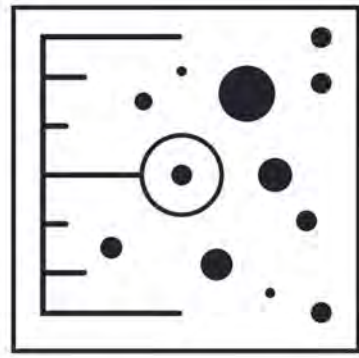
Moreover, our method does not require any **reconstruction of intensity images** from events, showing that training directly from raw events is possible, **more efficient**, and **more accurate** than passing through an intermediate intensity image.

Experiments on the algorithmically generated dataset introduced in this work, for which events and gray level images are available, show **performance on par** with that of highly tuned and studied frame-based detectors.

25M bounding boxes
15H recording
1MP resolution

[DOWNLOAD FREE](#)

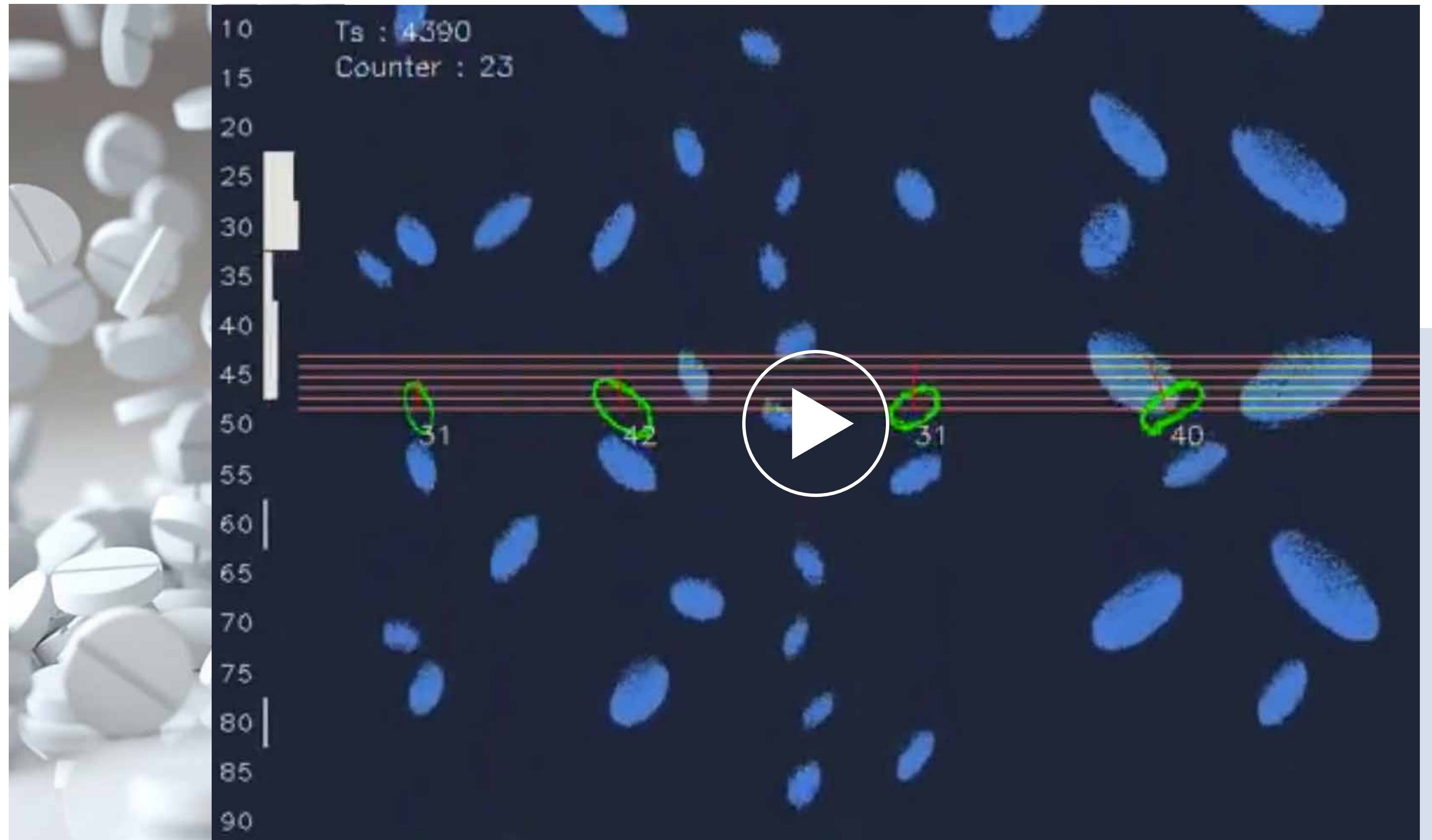
NEW



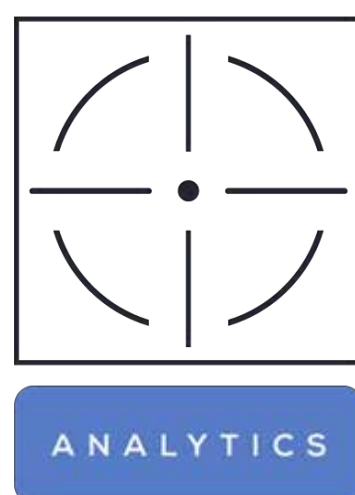
PARTICLE/OBJECT SIZE MONITORING

Control, count and measure the size of objects moving at very high speed in a channel or a conveyor.
Get instantaneous quality statistics in your production line, to control your process.

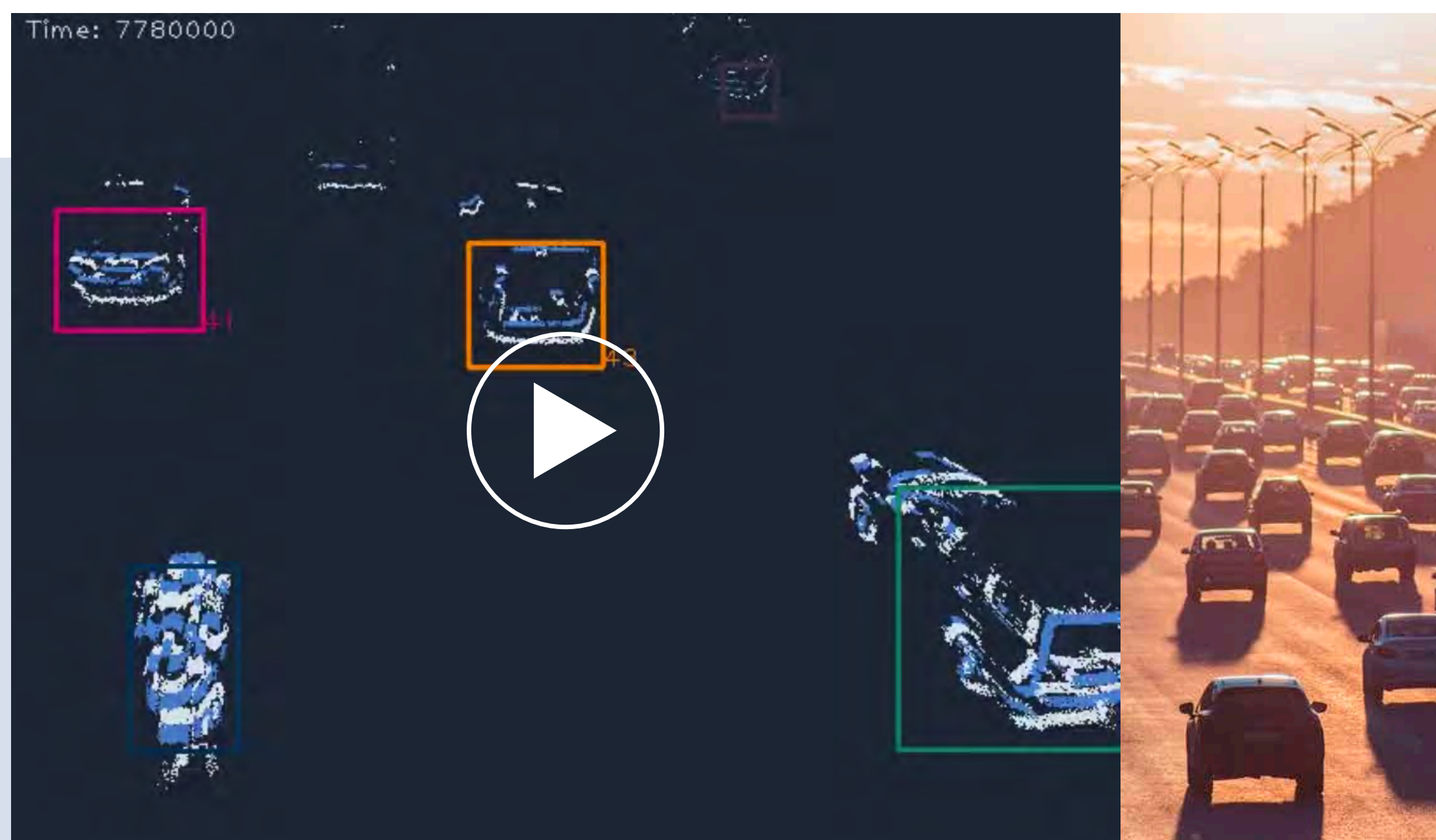
Up to 500 000 pix/s speed
99% counting precision



Typical use cases: High speed counting, Batch homogeneity & Gauging



OBJECT TRACKING



Track moving objects in the field of view.
Leverage the **low data-rate and sparse information** provided by event-based sensors to track objects with **low compute power**.

Continuous tracking in time: no more "blind spots" between frame acquisitions
Native segmentation: analyze only motion, ignore the static background



ANALYTICS

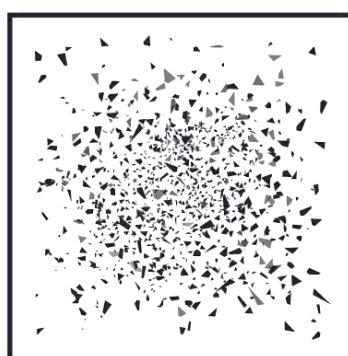
VIBRATION MONITORING



Monitor vibration frequencies continuously, remotely, with pixel precision, by tracking the temporal evolution of every pixel in a scene.

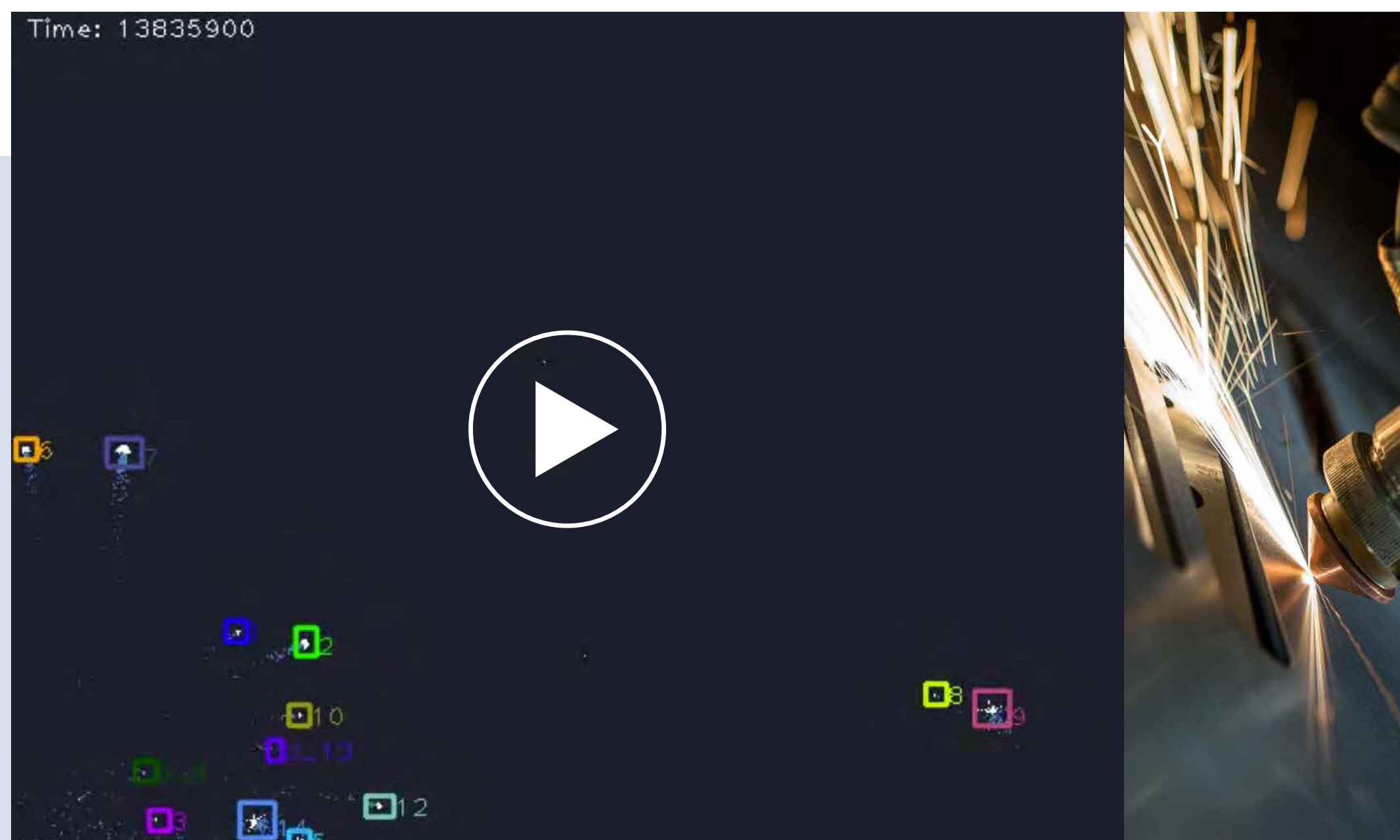
For each event, the pixel coordinates, the polarity of the change and the exact timestamp are recorded, thus providing a **global, continuous** understanding of vibration patterns.

From **1Hz to kHz** range
1 Pixel Accuracy



ANALYTICS

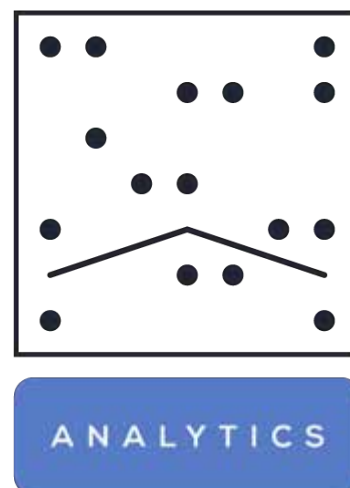
SPATTER MONITORING



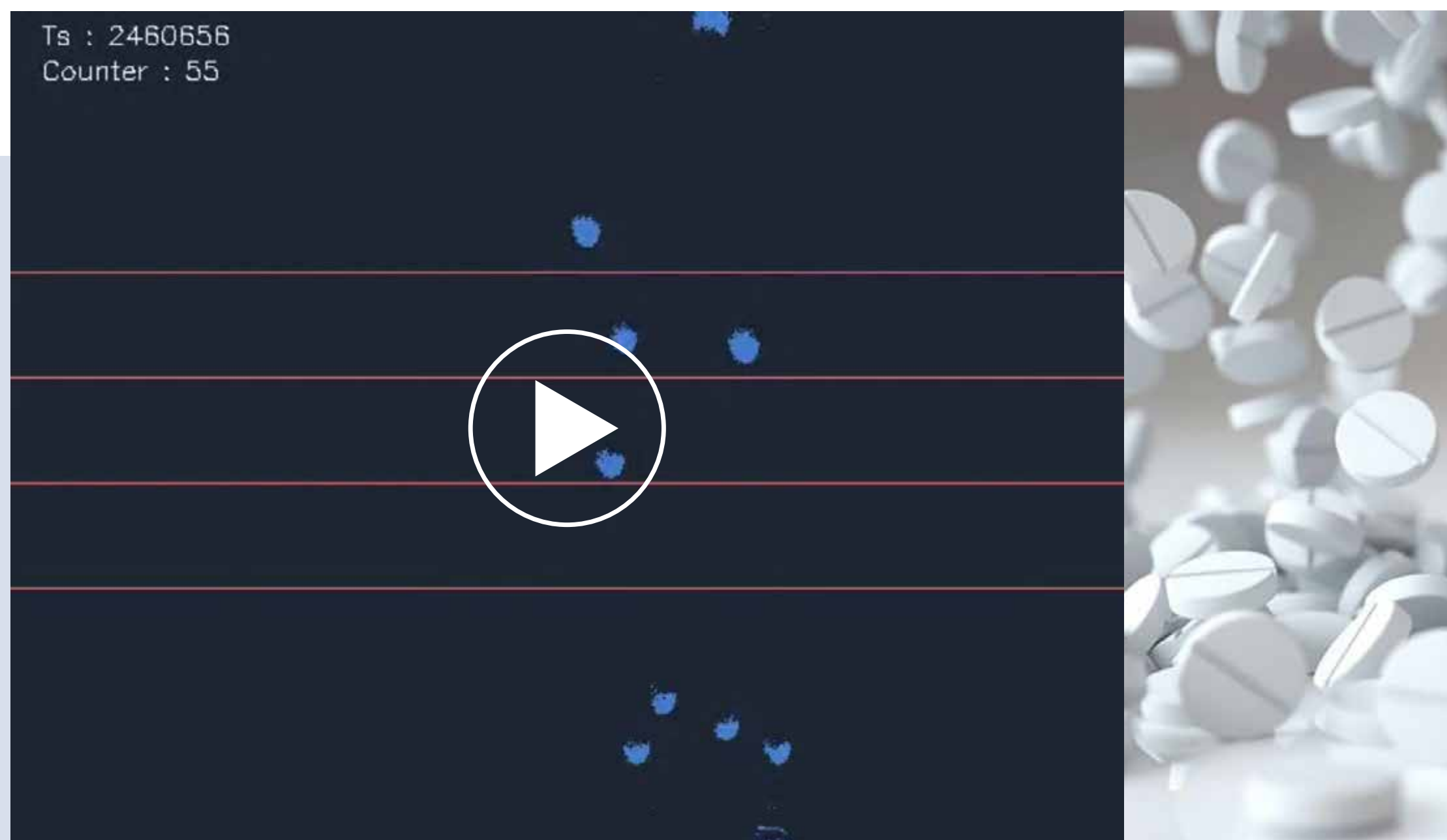
Track small particles (typ. size 10pixels) with spatter-like motion.

Thanks to the **high time resolution** and **dynamic range** of our Event-Based Vision sensor, small particles can be tracked in the most difficult and demanding environment.

Up to **200k fps rendering** (5 μ s time resolution)
Simultaneous XYT tracking of all particles



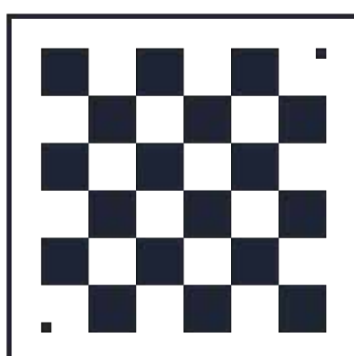
HIGH-SPEED COUNTING



Count objects at unprecedented speeds, high accuracy, generating less data and without any motion blur.

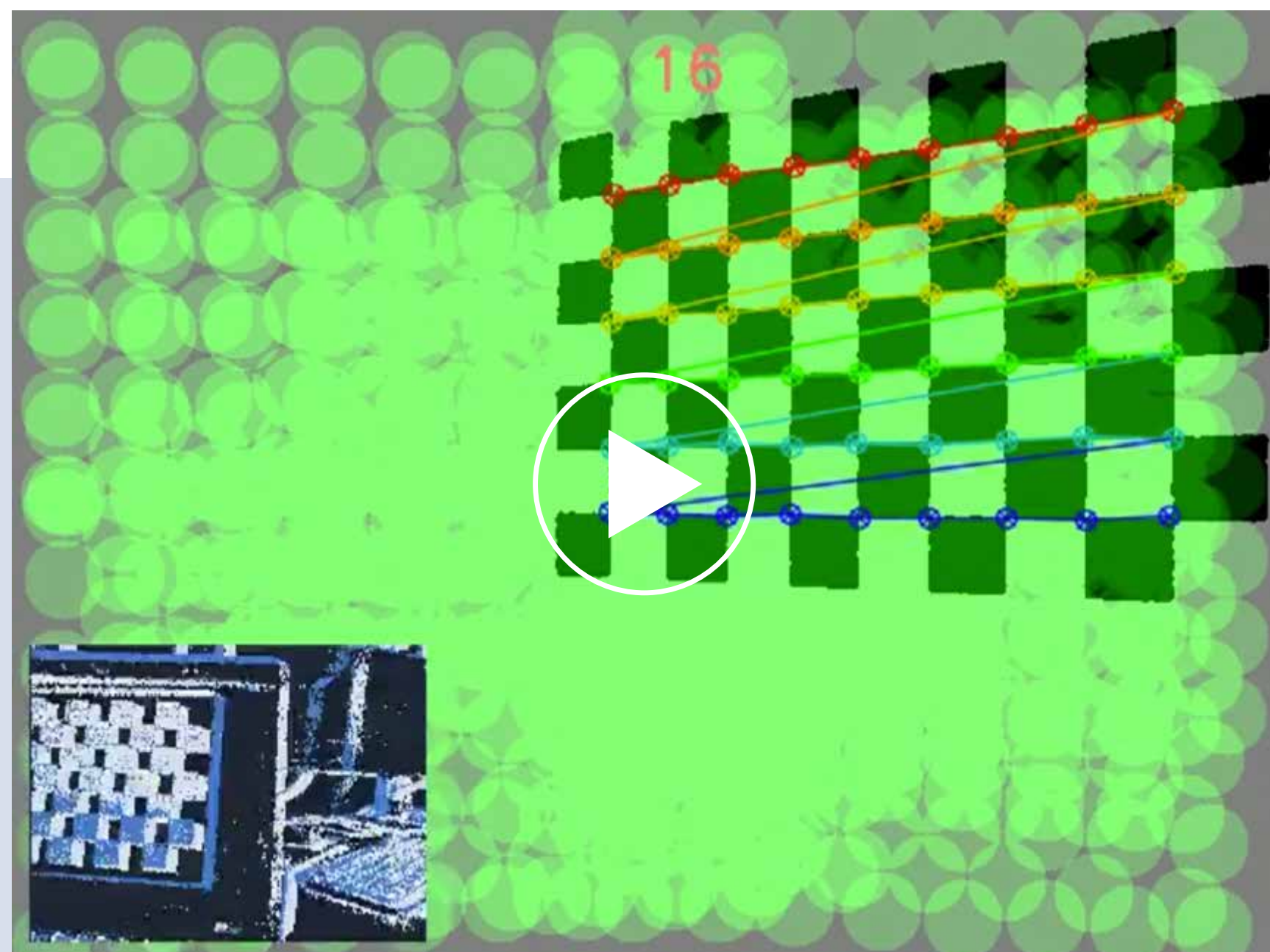
Objects are counted as they pass through the field of view, triggering each pixel independently as the object goes by.

>1,000 Obj/s. Throughput
>99.5% Accuracy @1,000 Obj/s.



CALIBRATION

CALIBRATION TOOLS

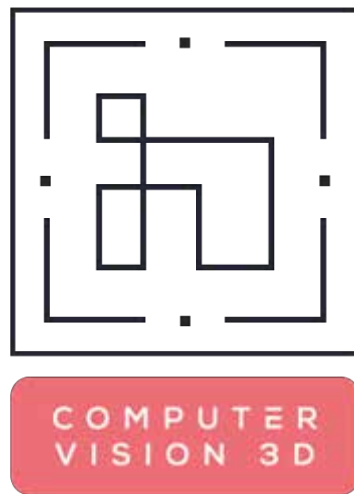


Deploy your applications in **real-life environments** and control all the optical parameters of your event-based systems.

Calibrate your cameras and adjust the **focus** with a suite of pre-built tools. Extend to your specific needs, and **connect** to **standard calibration routines** using our algorithmic bricks.

Automatic **intrinsic** camera calibration
Lens focus assessment

NEW



EDGELET TRACKING

Track 3D edges and/or Fiducial markers for your AR/VR application. Benefit from the high temporal resolution of Events to increase accuracy and robustness of your edge tracking application.

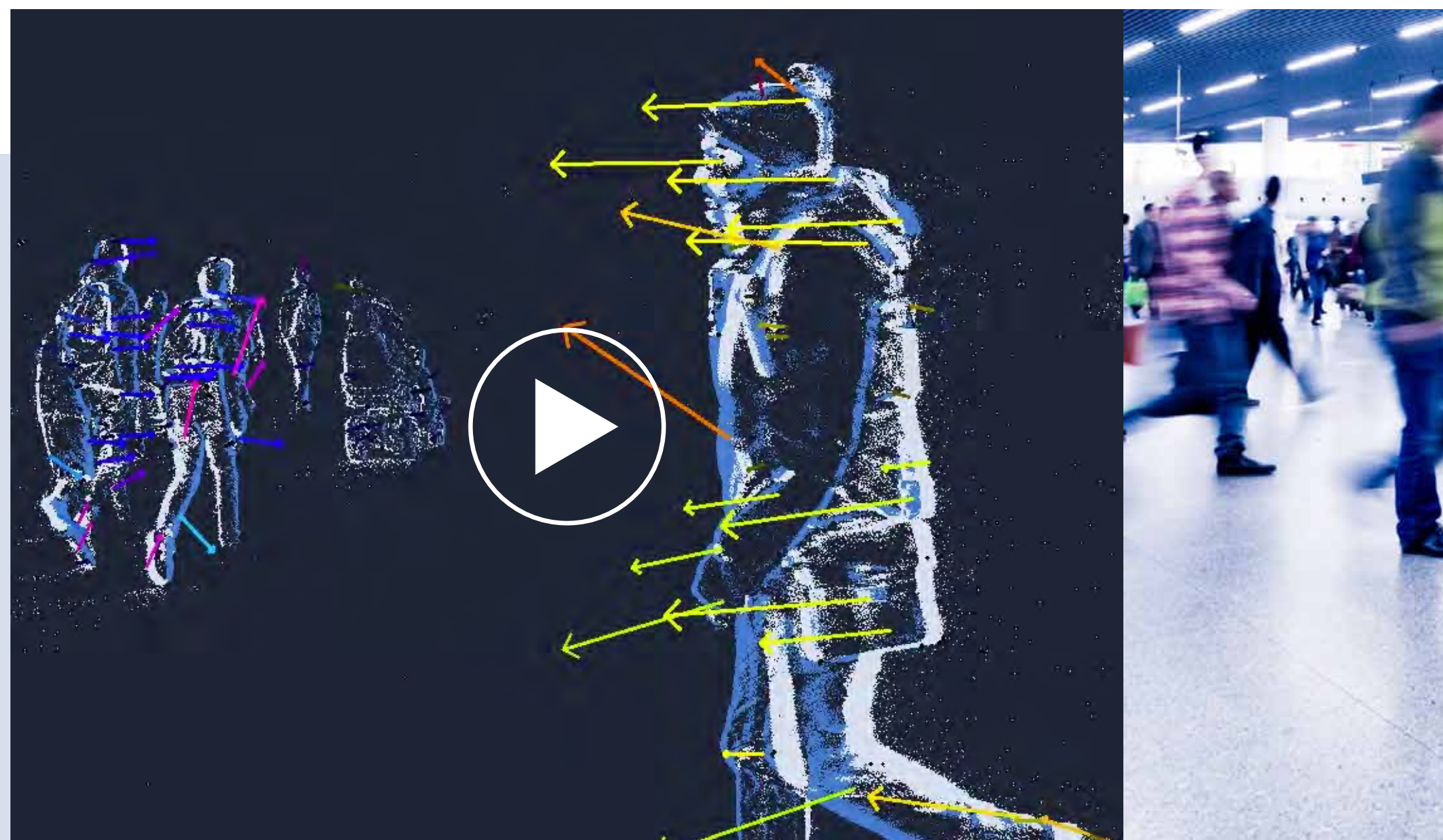
Automated 3D object detection, with geometrical prior
3D object real-time tracking



Typical use cases: High speed location, Guiding and fitting for pick & place



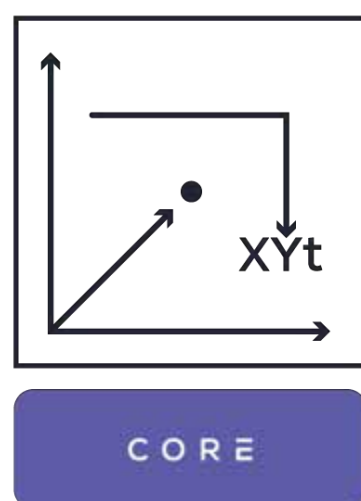
OPTICAL FLOW



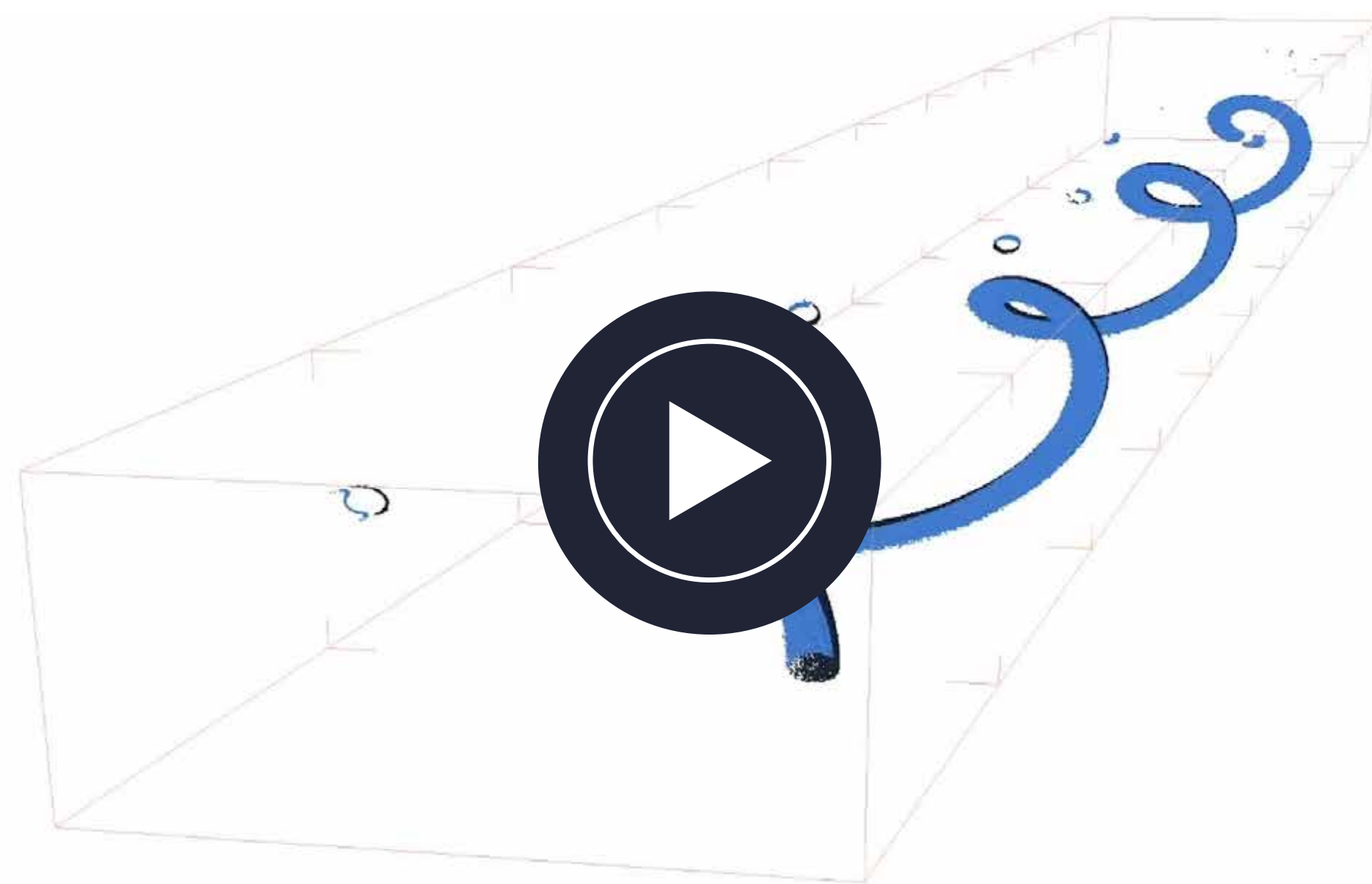
Rediscover this fundamental computer vision building block, but with an event twist.

Understand motion much more efficiently, through continuous pixel-by-pixel tracking and not sequential frame by frame analysis anymore.

17x less power compared to traditional image-based approaches
Get features **only on moving objects**

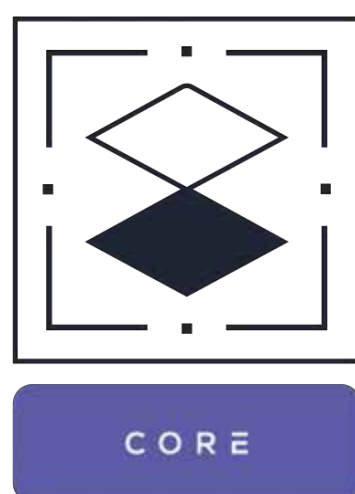


XYT VISUALIZATION



Discover the power of time – space continuity for your application by visualizing your data with our XYT viewer.

See between the frames
Zoom in time and understand motion in the scene

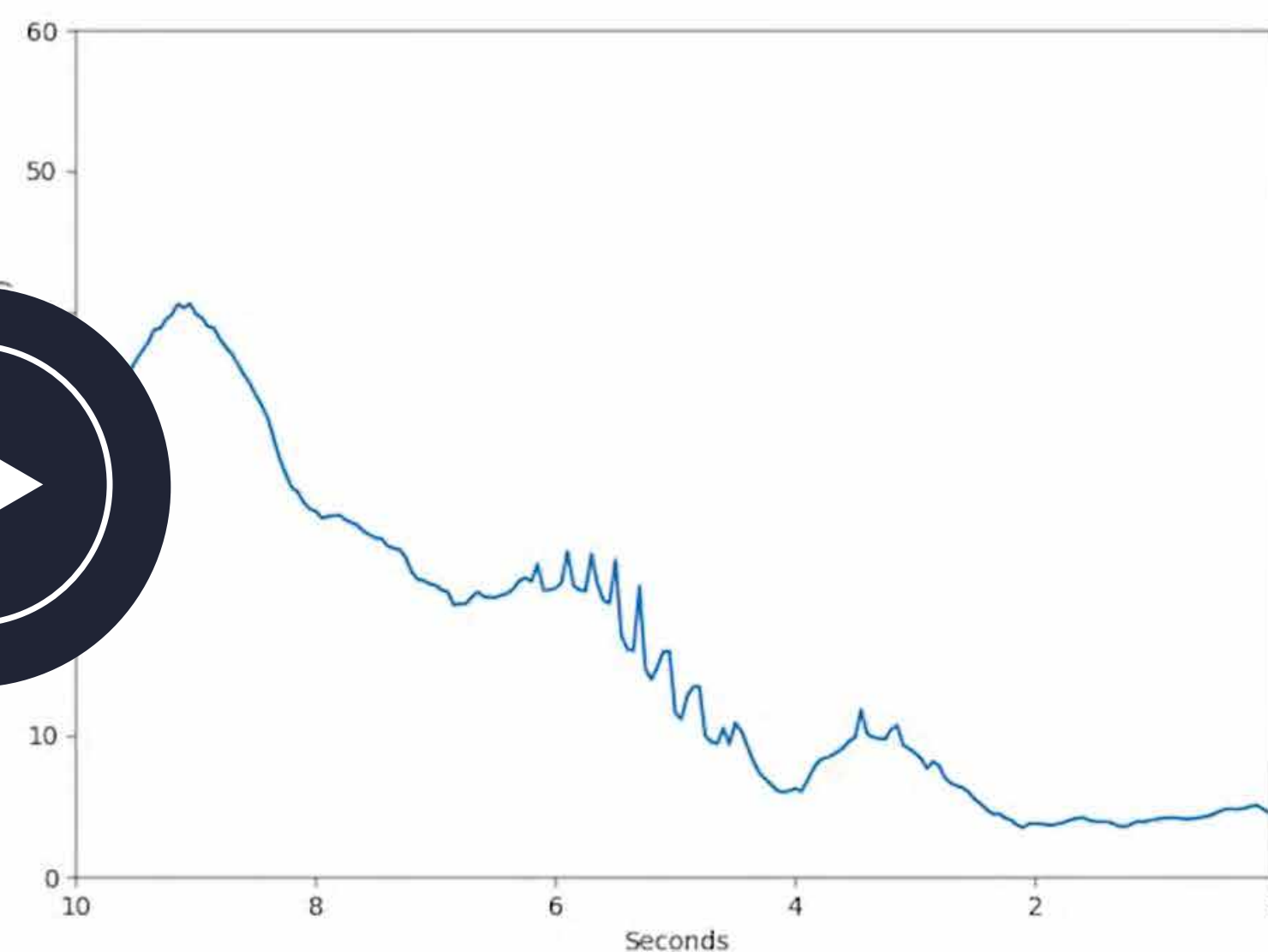
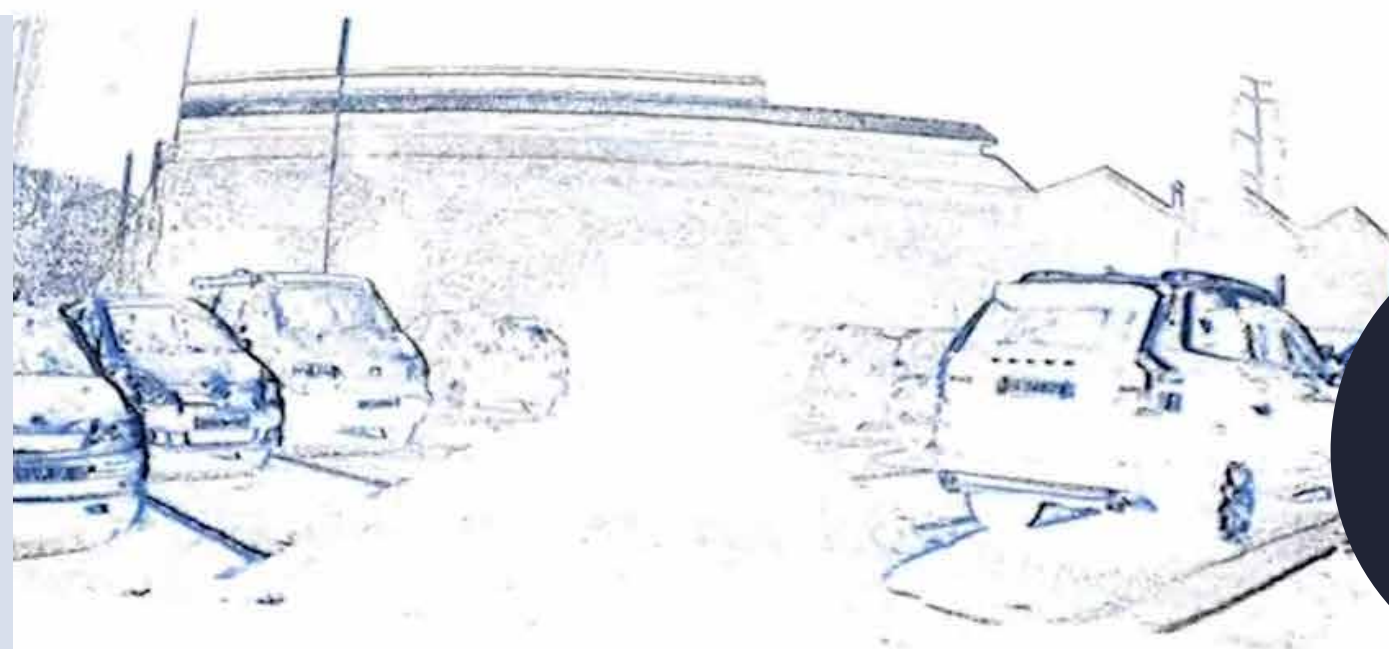


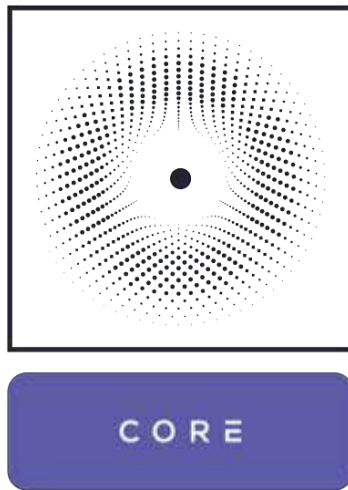
DATARATE VISUALIZATION

Understand the process of event generation over time, visualize data and generate plots with the power of python.

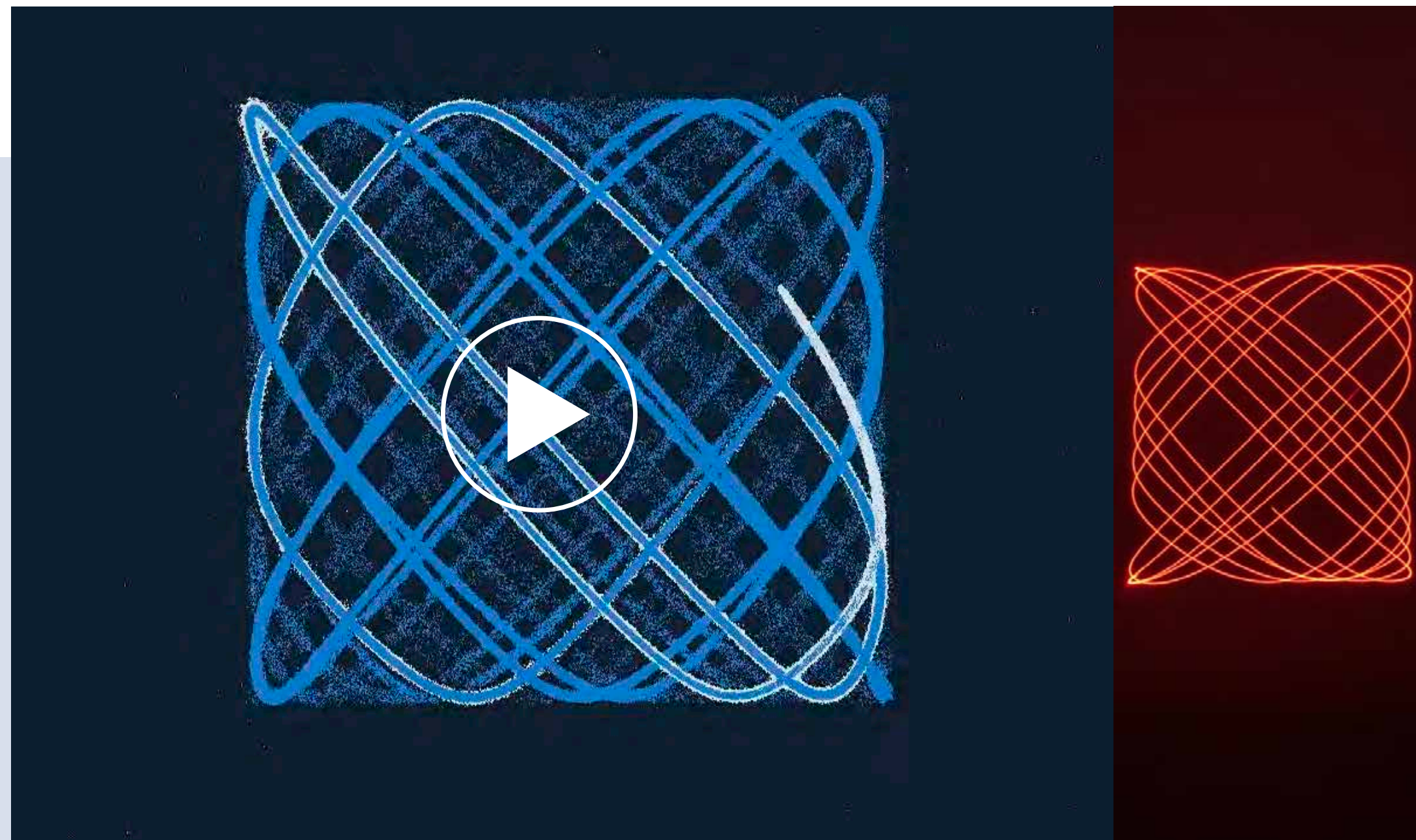
Ready-to-use Python environment

Interface with **recordings & live cameras**





ULTRA SLOW MOTION

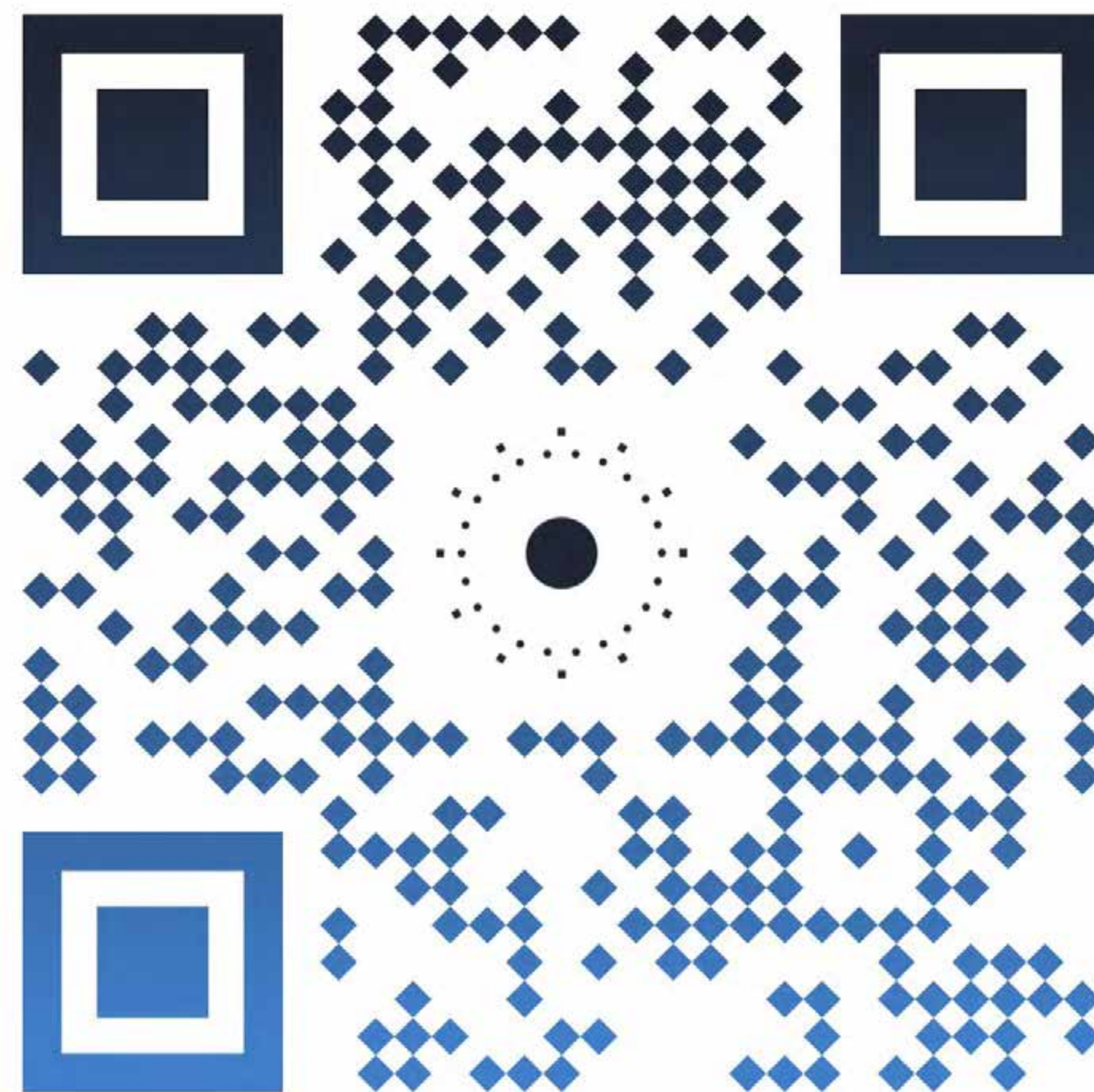


Slow down time, down to the time-resolution equivalent of **over 200,000+ frames per second**, **live**, while generating orders of magnitude **less data** than traditional approaches.

Understand the **finest motion dynamics** hiding in ultra fast and fleeting events.

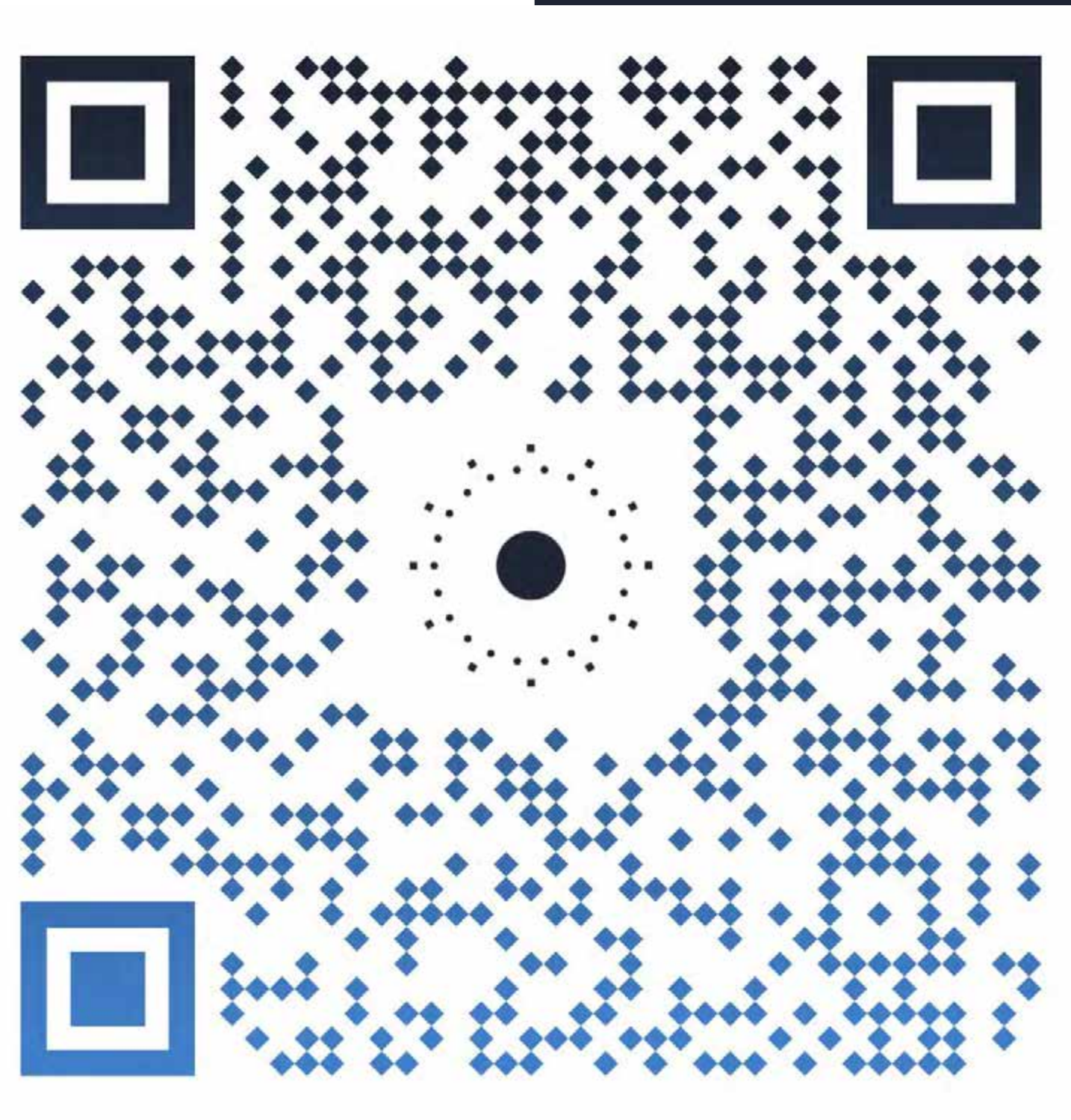
Up to **200,000 fps** (time resolution equivalent)

THANK YOU



www.prophesee.ai

THANK YOU



ID: Prophesee_China