

Revolutionising Track and Asset Monitoring Using AI-Enabled Fiber Optic Sensing



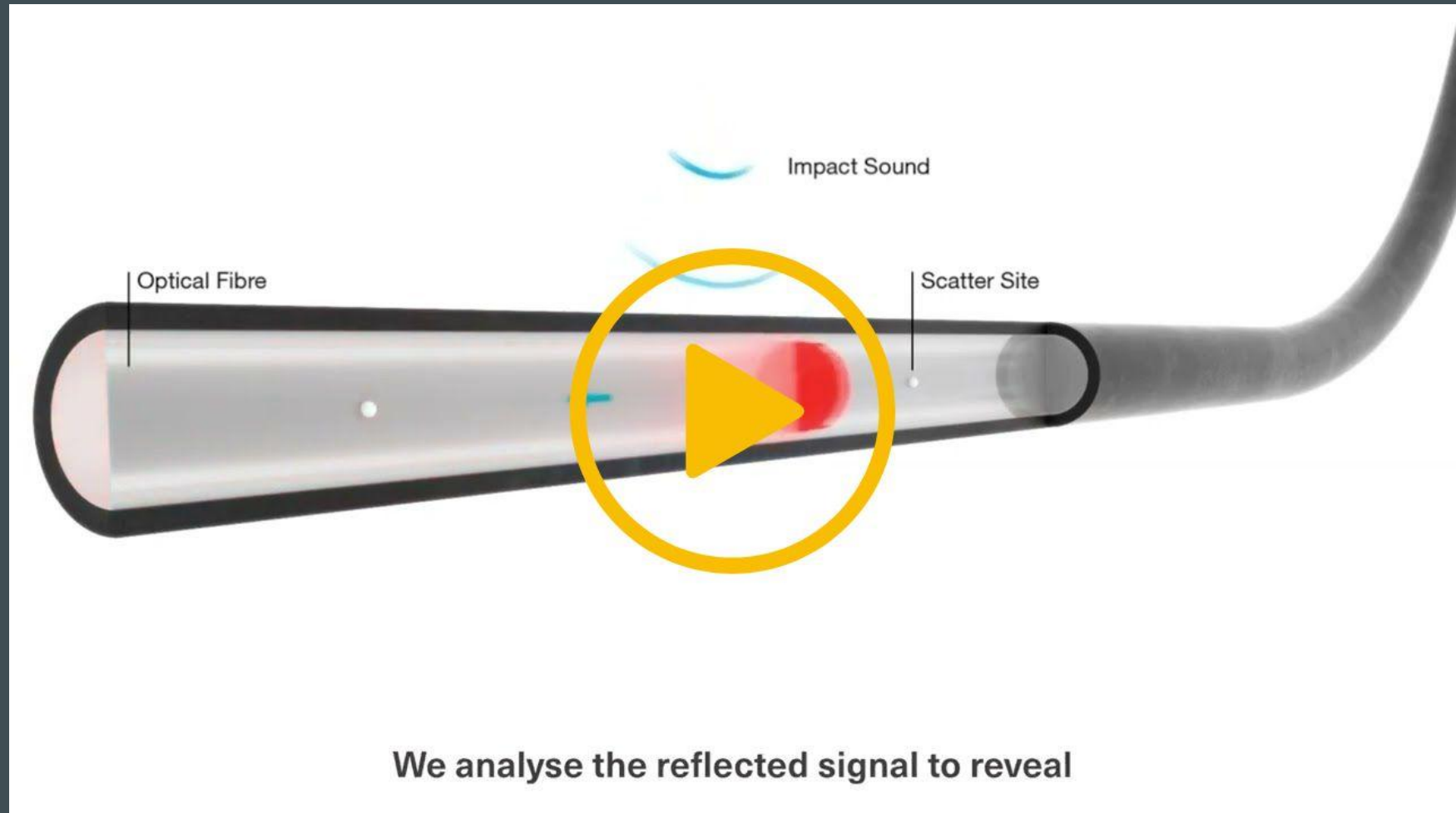
Watch our video introduction



Distributed Acoustic Sensing (DAS)

Operating Principle

- Laser light pulse reflections measure vibration and its location along fiber length
- Uses standard single mode optical fiber
- 2 x 40km range
- No additional sensors needed on track or train
- Listens to ground vibrations 24/7
- Sensitive enough to detect quiet events such as people walking



[Click to open video explainer on YouTube](#)

Distributed Acoustic Sensing (DAS)



Technology Platform

- Common hardware platform for all applications
- 80kms route coverage from one small unit
- Over 150 measurement locations per kilometre
- Flexible installation options (Cloud-based / Online / on-premises)
- On device AI-processing



Technology Applications

Continuous Monitoring



Track Condition Monitoring

Monitor changing asset condition to enable early interventions and targeted maintenance



Security

Detect trespass, digging, animal intrusion and cable events



Landslide & Rockfall

Provides alerts for rockfall & landslide events



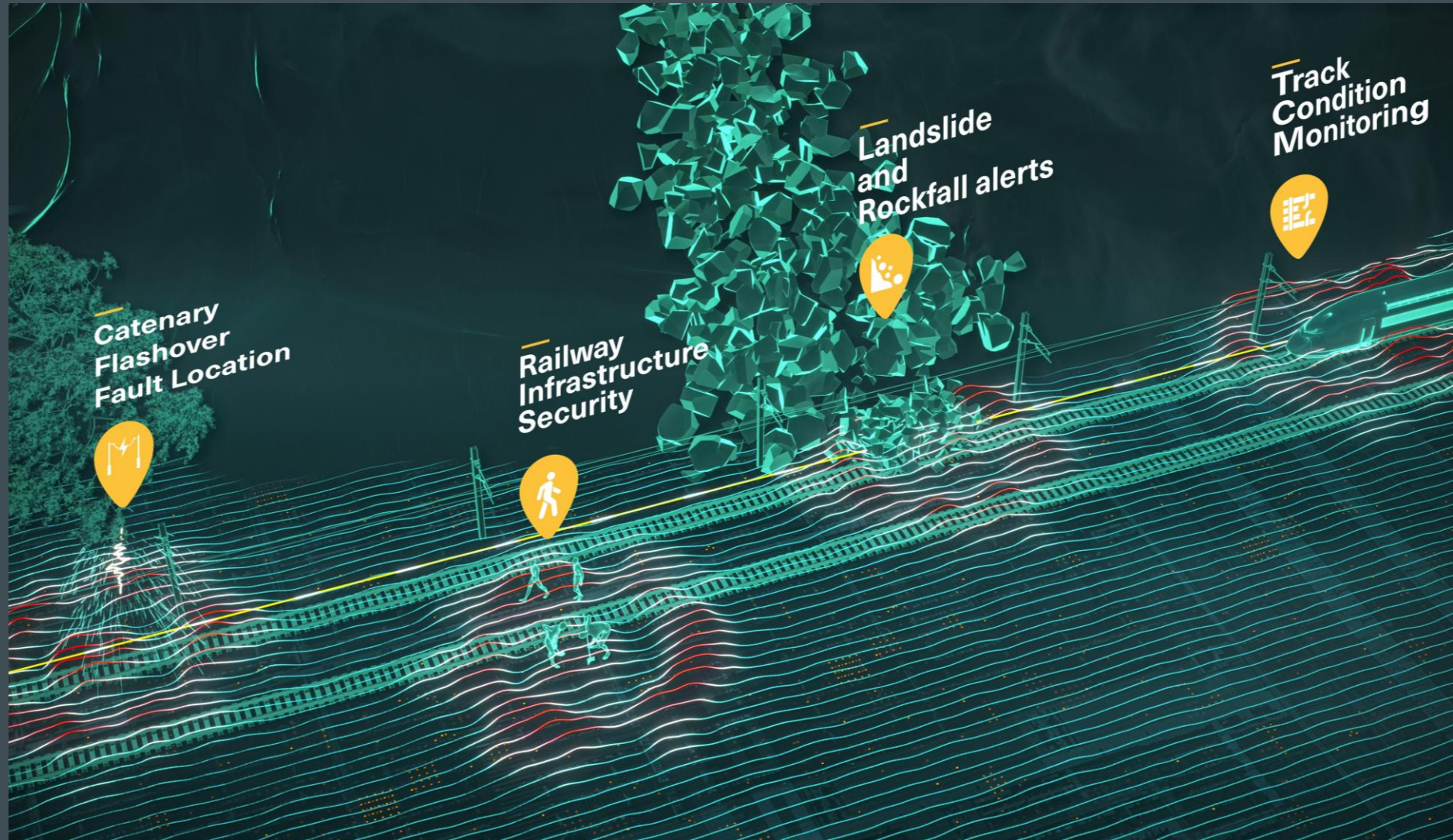
Flashover Location

Direct teams straight to site for preventive inspection and repair with high spatial accuracy

Realtime Events and Alert based Monitoring

Technology Applications

-  Track Condition Monitoring
-  Security
-  Natural Hazards
-  Catenary Flashover Location



Technology Applications



Track Condition Monitoring

- SonicTwin® generated of rail infrastructure
- Data generated from every train
- Changing vibration signature = Change in asset condition

Examples of track defects detected by increasing vibration



Wheel burn



Squat



Broken rail / weld



Loose bolts / joint

Technology Applications

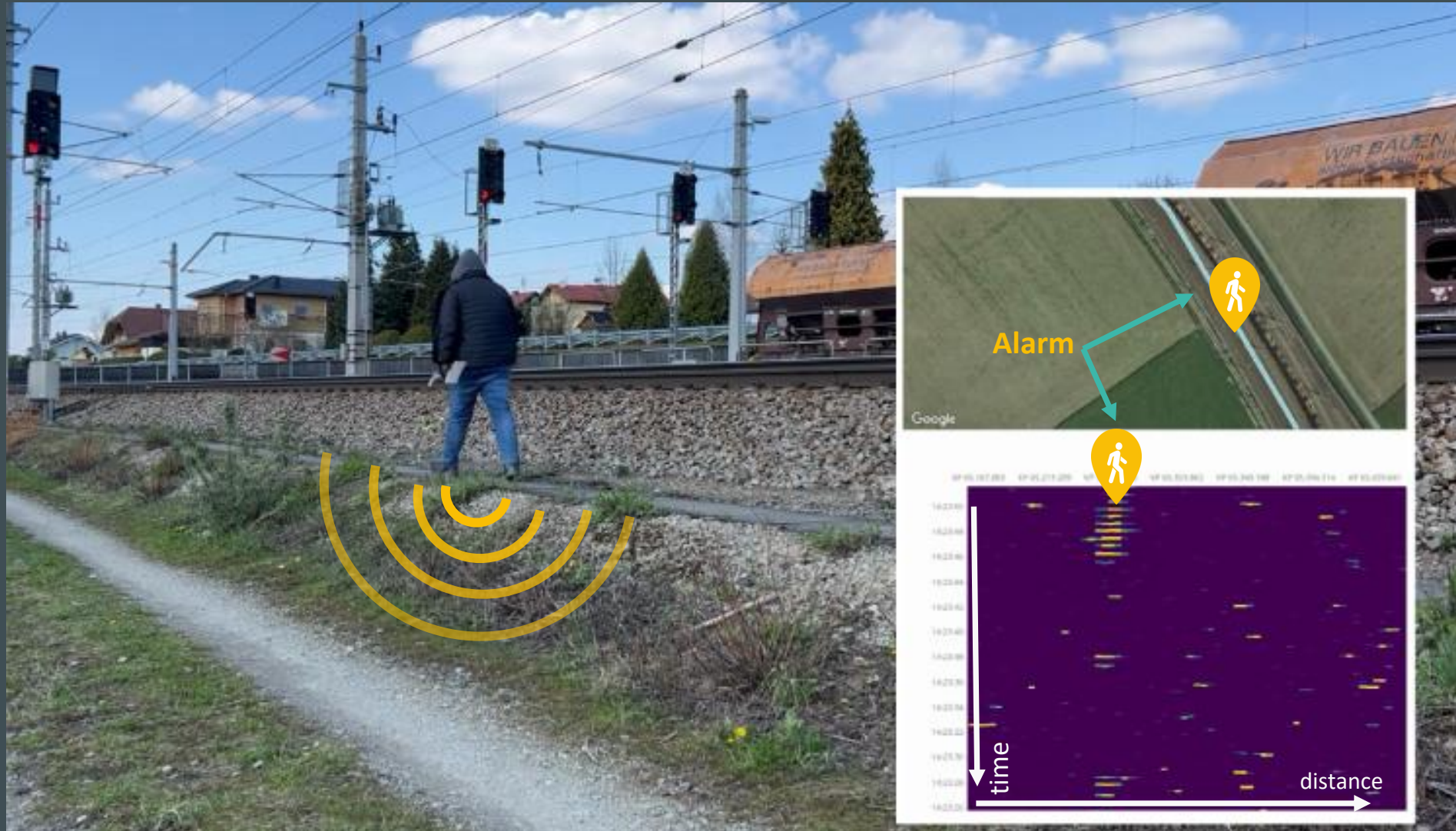


Security

- Real-time detection and classification of activities
 - Trespass / Walking
 - Digging
 - Cable events
- Accurate geolocation
- Integrates with CCTV
- See it in action



Click to open video playlist on YouTube



Technology Applications



Natural Hazards

- Real-time detection of Rockfall and Landslide
- Automated alerts
- Automatic re-arm
- Up to 80km / 50 miles protection per unit
- See it in action



*Click to open video playlist
on YouTube*



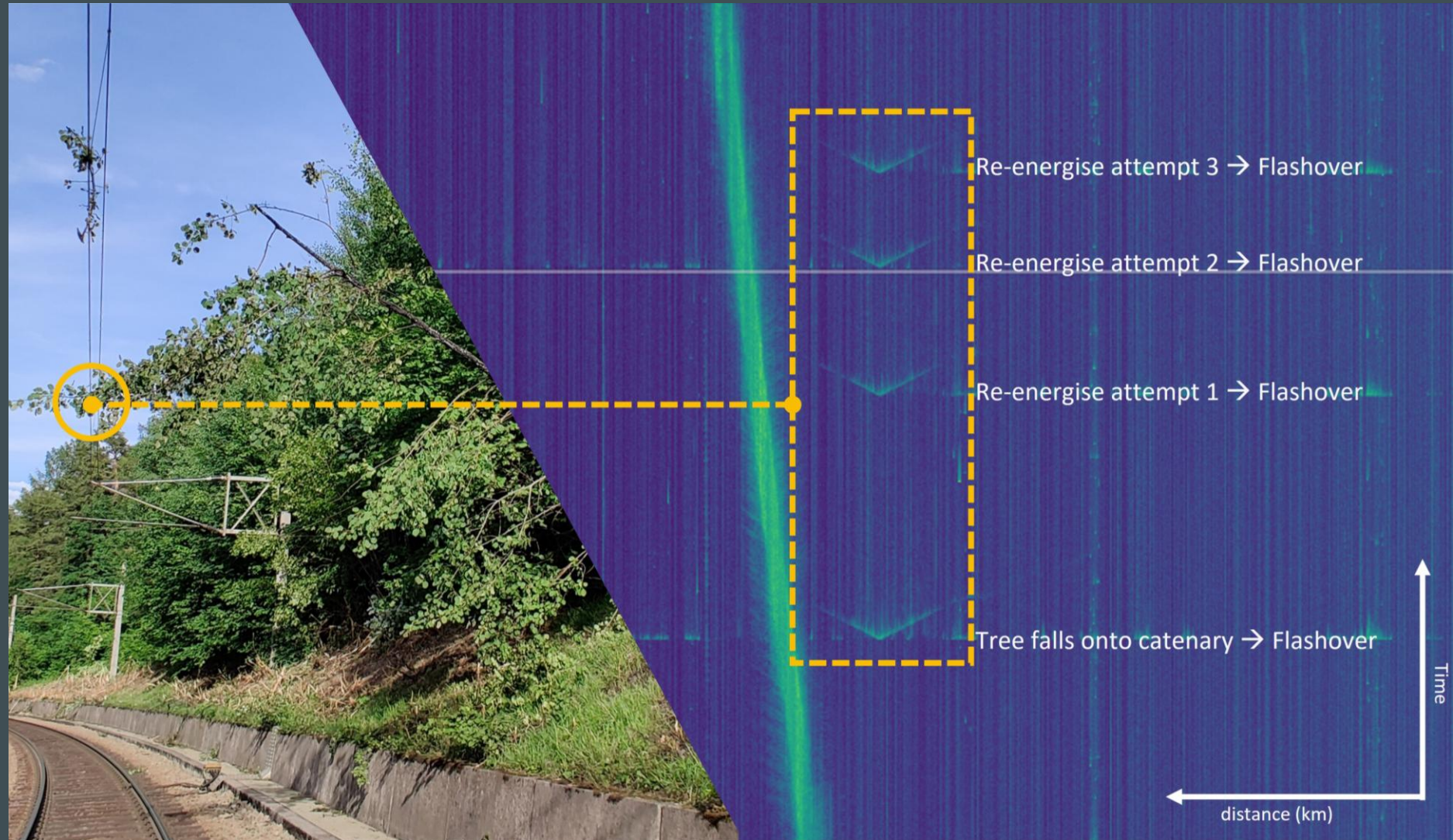
Technology Applications



- Accurate location of flashover faults ($\pm 10\text{m}$ typical)
- Up to 80km / 50 miles protection per unit
- Find and fix faults faster
- Inspect only incident area
- See it in action



Click to open video playlist on YouTube





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More about

Sensonic

About Sensonic

Pioneers in Fiber Optic Sensing for Railways

2019

Foundation as spin off
Frauscher Sensor Technology

10+ years

experience with
100% focus on railways

49

Employees

Core
Competence



Information Provider based
holistic 24/7 monitoring



Creating a Digital Twin that
hosts unlimited information

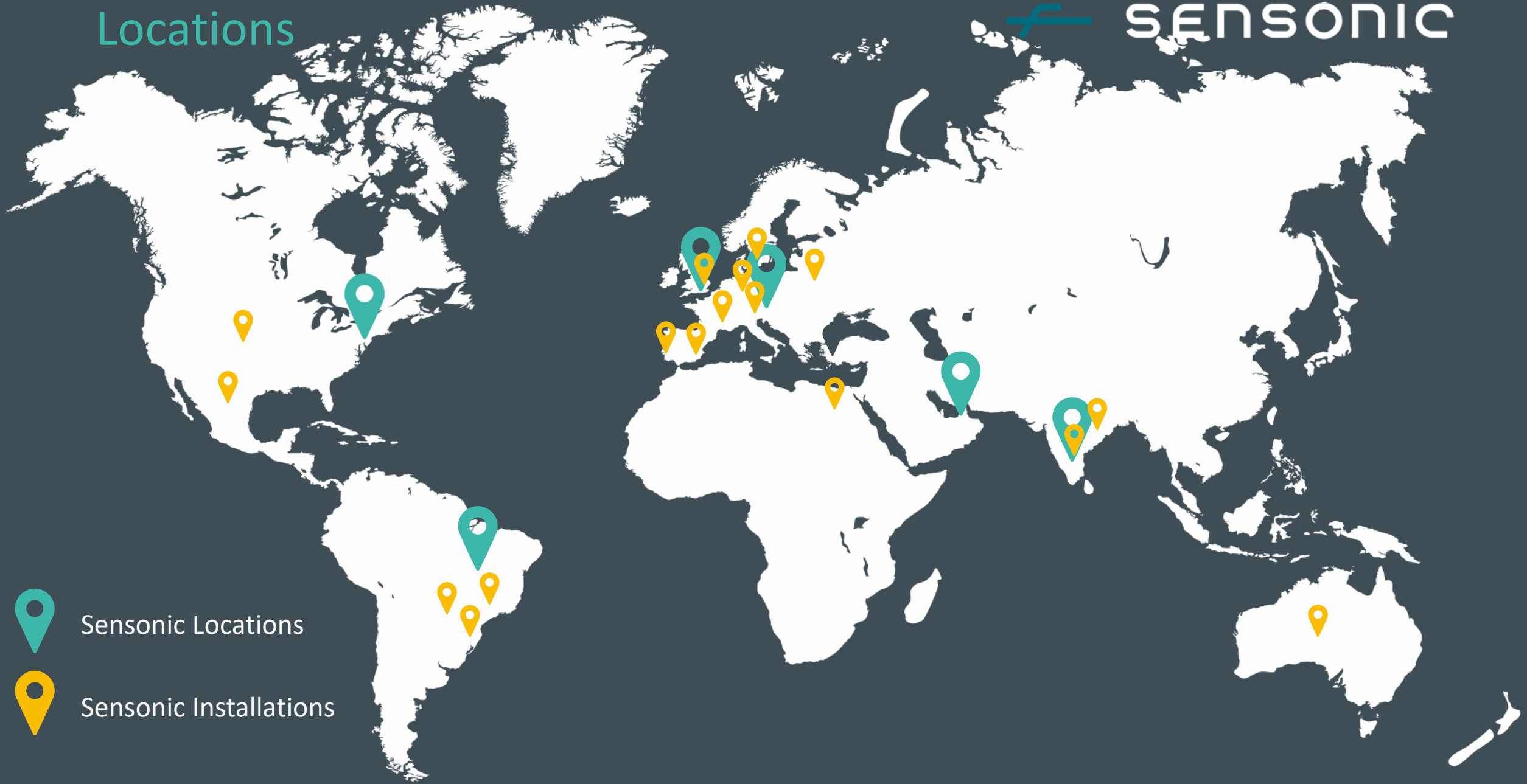
Deriving insights based on data
driven solution and AI

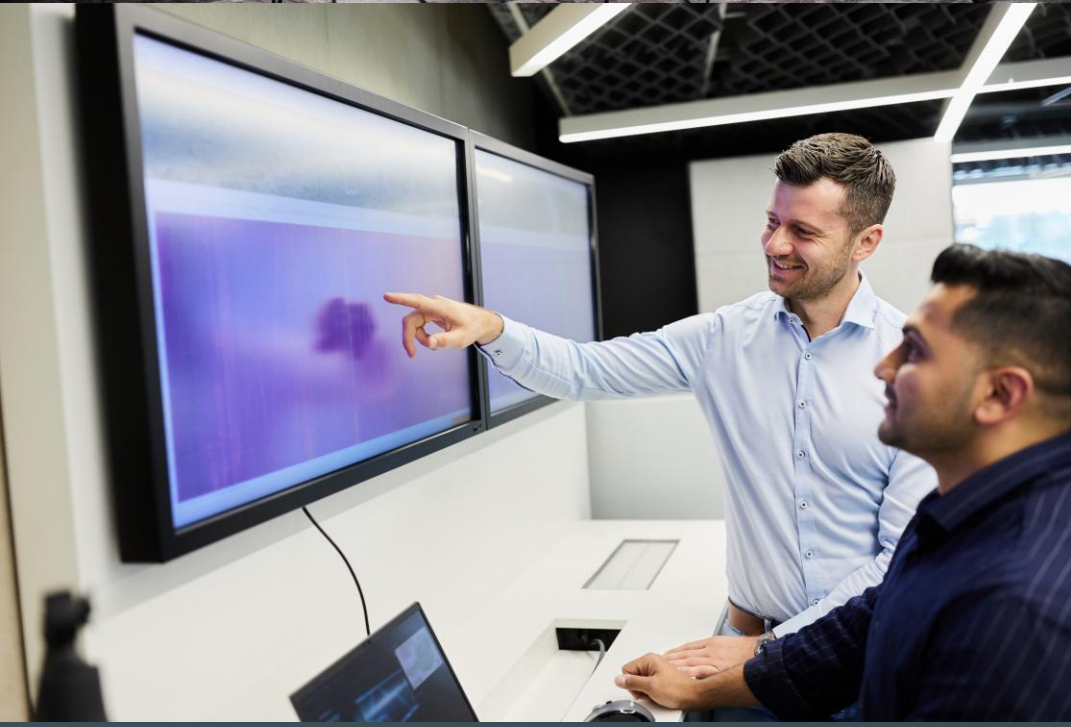


SENSONIC

Locations

-  Sensonic Locations
-  Sensonic Installations





Our Vision

To lead a revolution in better railway decision-making powered by fiber optic sensing insights

Our Mission

To build a customer centric business powered by ground-breaking technologies and passionate people

Customer Achievements



Launch of Track Condition Monitoring (TCM) application



First critical defect identified by TCM application.

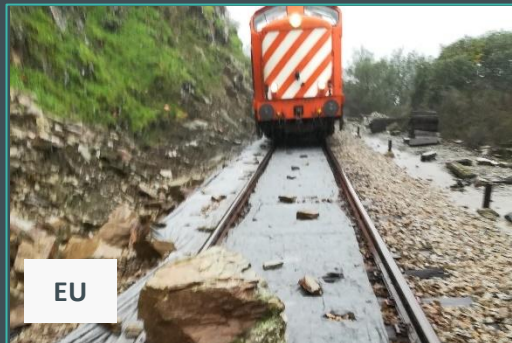


Demonstration of security detection



2022

2023



First accident prevented by a Sensonic rockfall alert.



Successful validation of rockfall detection.

Customer Achievements



Integration of CCTV into Security application



Launch of AI on device capability (AI on Edge)



Demonstration of cable theft security detection



2024



Elephant detection contract win, and delivery commenced in India



Assessment of capabilities at TTC with CSX / ENSCO / Alstom