



Pipeline inspections using Machine Learning

Our Human in the Loop approach

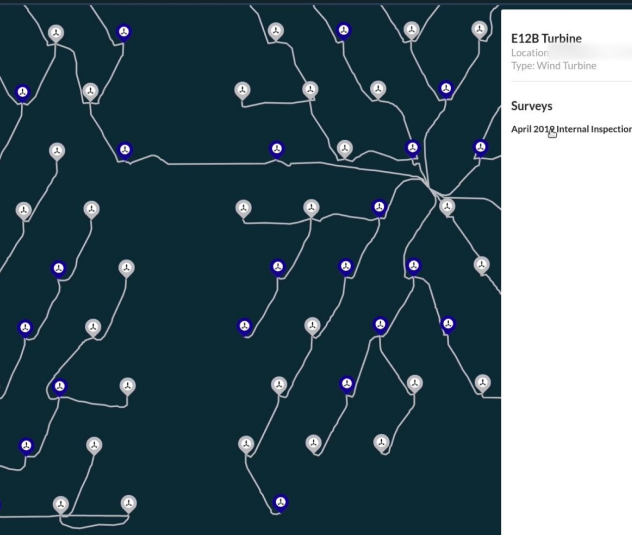
Mike Gallo
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Overview

Rovco is a leading ROV services and technology provider, creating the technological foundations that will make Truly Autonomous Survey a reality.

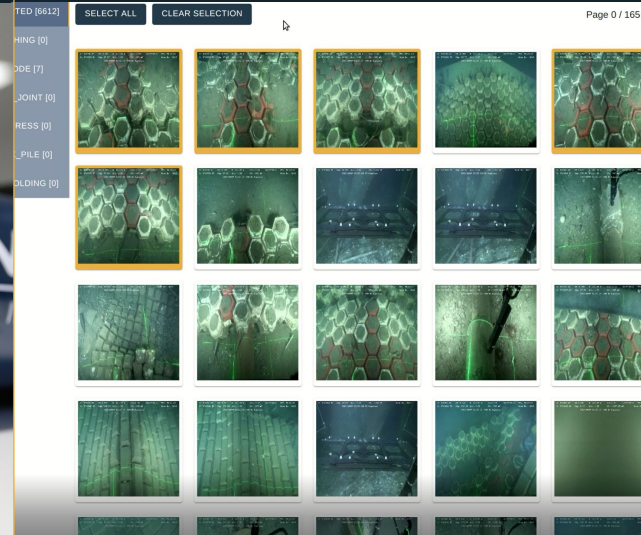
Intelligent Data Platform



Real Time Imaging System



Machine Learning



ROV Services



- Technology provider company Vaarst to be launched in Q1 2021
- SubSLAM X2 is a perception system for robotic platforms, Close Range Autonomous Navigation development path
- Currently operating in Subsea Energy Sector, plan to expand to air and other industries
- The Intelligent Data Platform to be launched in Q1 '21, will be gradually developed into a platform system for Cloud Robotic controlling
- Global reach - Investing in US and APAC locations to support clients in those emerging markets
- ROV services provision since 2016, worked on over 50% of operational OWF in the UK
- £5m Series A investment enabling accelerated growth with financial surety
- Based in the UK, with offices in Bristol and Edinburgh – Contributing to growing Local Content targets

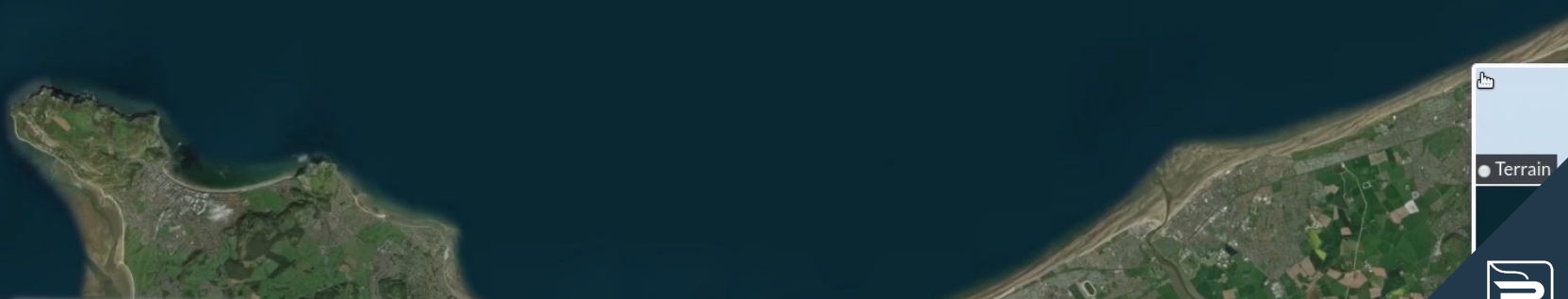
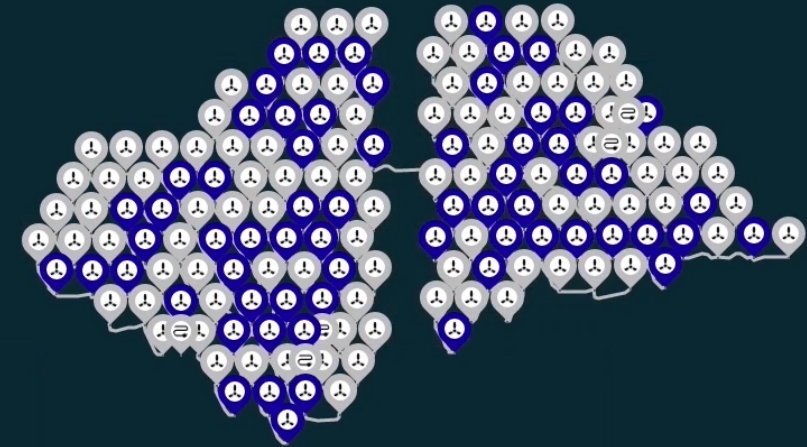
Smart Data Collection





Intelligent Data Platform

- Industry changing survey data
- Automatic, instant analysis
- Live reporting
- Increased collaboration
- Quantifiable metrics of risk
- Data transmitted live to shore

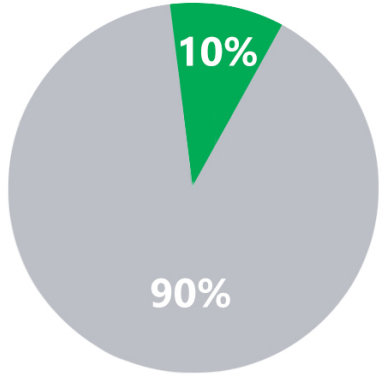


Latitude:

Intelligent Data Platform

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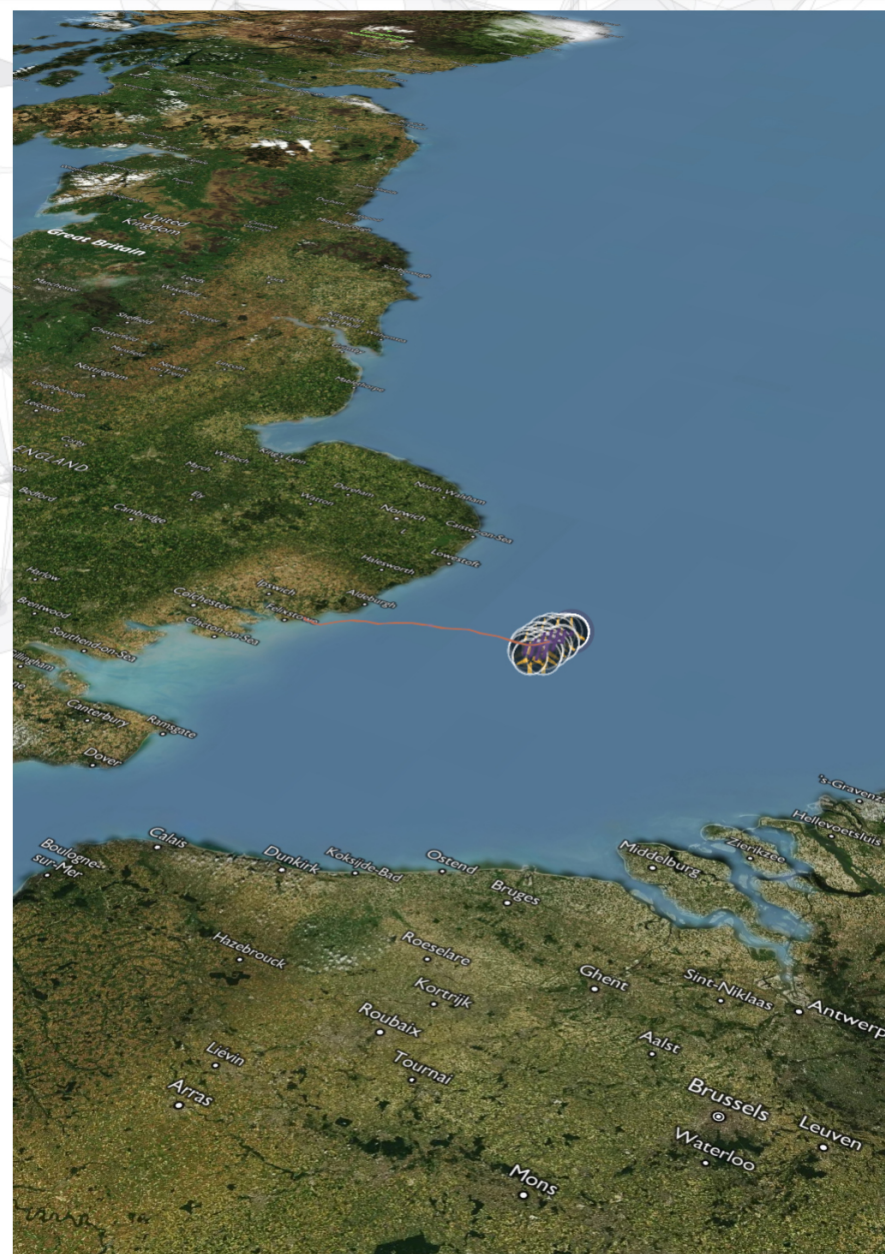
Campaign



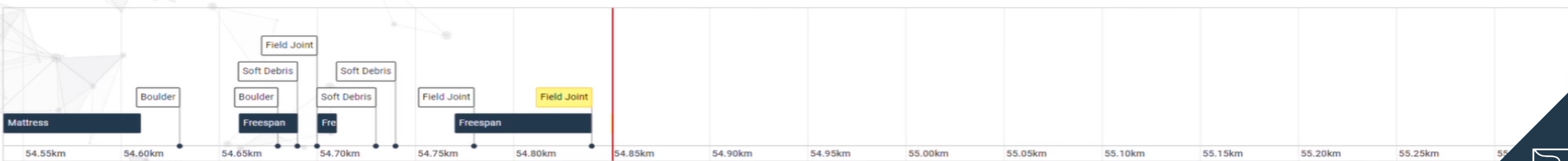
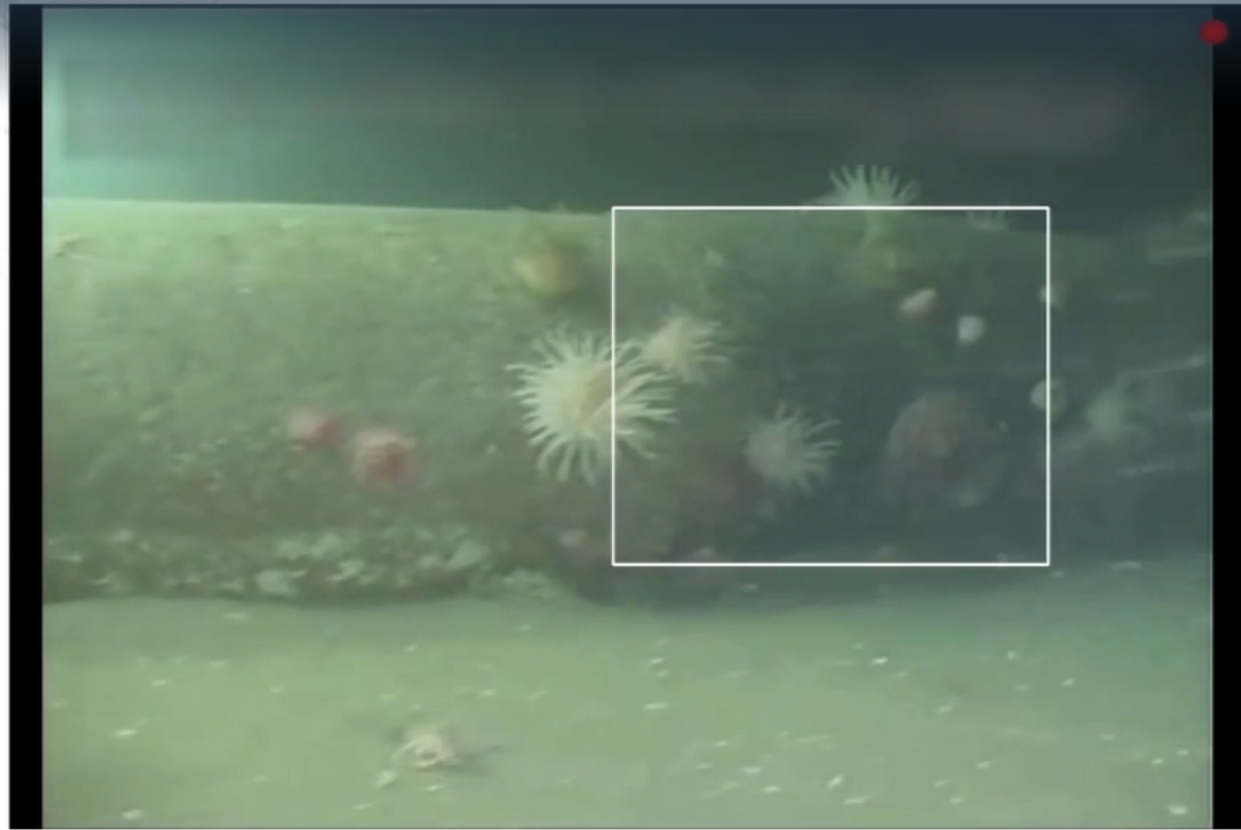
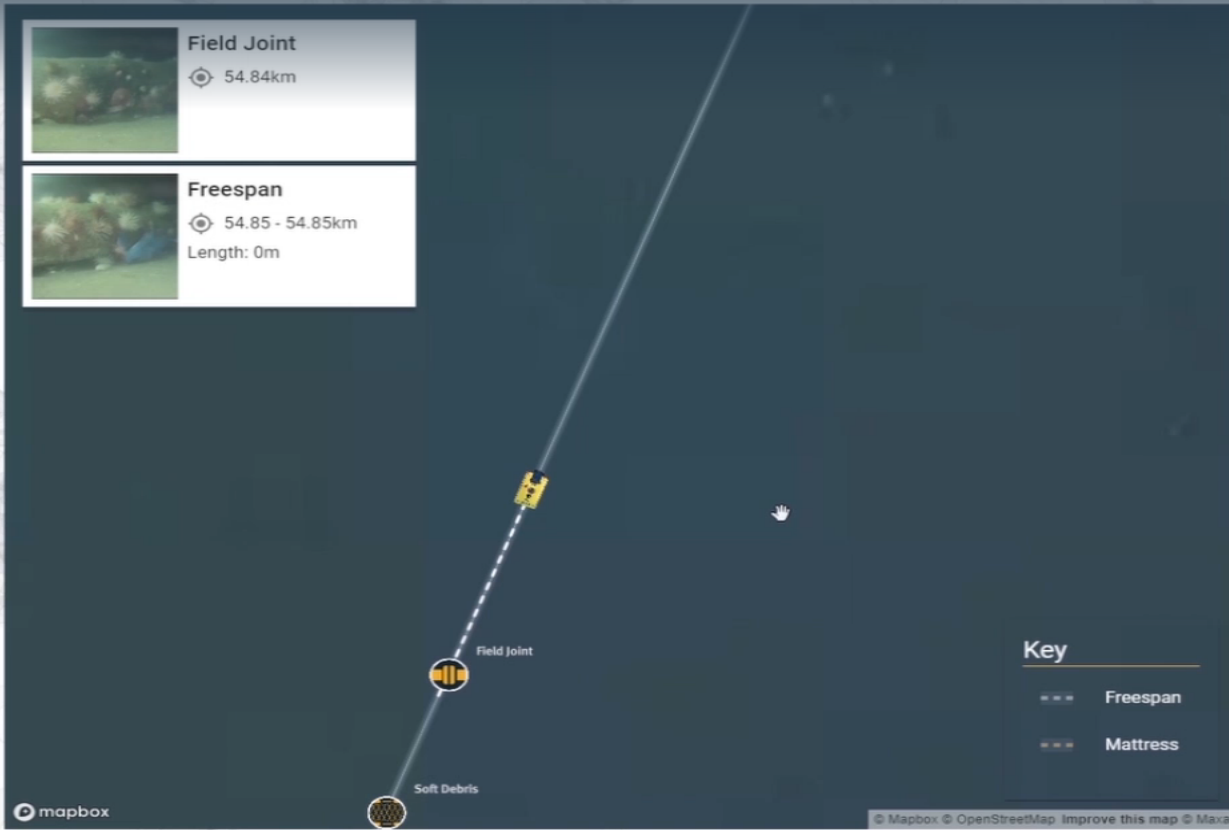
10% Completed
90% Remaining

VIEW CAMPAIGN DATA

Asset	Progress	Anomalies	Status
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Task 2	<div style="width: 0%;"></div> 0%	0	
Task 3	<div style="width: 0%;"></div> 0%	0	
Task 4	<div style="width: 46%;"></div> 46%	0	●
Task 5	<div style="width: 0%;"></div> 0%	0	
Task 6	<div style="width: 81%;"></div> 81%	3	●
Task 7	<div style="width: 0%;"></div> 0%	0	
Task 8	<div style="width: 0%;"></div> 0%	0	
Task 9	<div style="width: 0%;"></div> 0%	0	



Pipeline Inspection – ML detection v1.0



IDP – Machine Learning

The Machine Learning conundrum

ML systems will improve over time but need to be used to do so. However, to become widely adopted, performance must be 'as good', or better than the human operator.

These systems will detect common events, but how can you get them to spot rare events that may not appear in the training data, such as physical damages, heavy corrosion, coating issues?

bar_anode
[MARINE_GROWTH: LOW]
[DEPLETION: 0-25%]

bar_anode
[MARINE_GROWTH: LOW]
[DEPLETION: 0-25%]



IDP – Machine Learning

Human in the Loop Approach

The screenshot displays the ROVCO Ocean Insight software interface. At the top, the ROVCO logo and navigation tabs (CAMPAIGN, FILE BROWSER, QUALITY CONTROL, INSPECT) are visible. The main interface is titled 'Inspect' and features a sidebar with filters for 'UNSORTED [6612]', 'NOTHING [0]', 'ANODE [7]', 'FIELD_JOINT [0]', 'MATTRESS [0]', 'ROCK_PILE [0]', and 'SCAFFOLDING [0]'. The central area shows a grid of 25 video frames, each with green laser lines overlaid. A 'Page 0 / 165' indicator and navigation arrows are present. A larger, detailed view of a single frame is shown on the right, featuring a data overlay with coordinates (E: 424746.81, N: 6702869.08), depth (D: 238.69 m), and other parameters. Below the detailed view are 'JUMP BACKWARD' and 'JUMP FORWARD' buttons. The background of the interface is decorated with a network diagram of interconnected nodes and lines.

- Simplify and accelerate ML engine training
- Speed up eventing operations at the same time
- Verify correct interpretation of ML, and add missed events manually, if required
- In time, human interaction will not be required, but the user will still have the benefit of a QC step in the eventing process

IDP Machine Learning

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Solution: Combine human operator and Machine Learning capabilities

- Simplify and accelerate Machine Learning engine training
- Speed up eventing operations at the same time
- Verify correct interpretation of Machine Learning, and add missed events manually, if required
- In time, human interaction will not be required, but the user will still have the benefit of a QC step in the eventing process
- Creation of an "interactive deliverable" which can be easily reviewed for spotting issues and planning future campaigns







THANK YOU


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