Novel technologies to boost the shipyard industry

Artificial Intelligence and Digital Platform Enabling FSW of Steel

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ORGANIZED BY THE EU HORIZON 2020 PROJECTS:

FIBRE4YARDS SHIPYARD FOR THE FUTURE

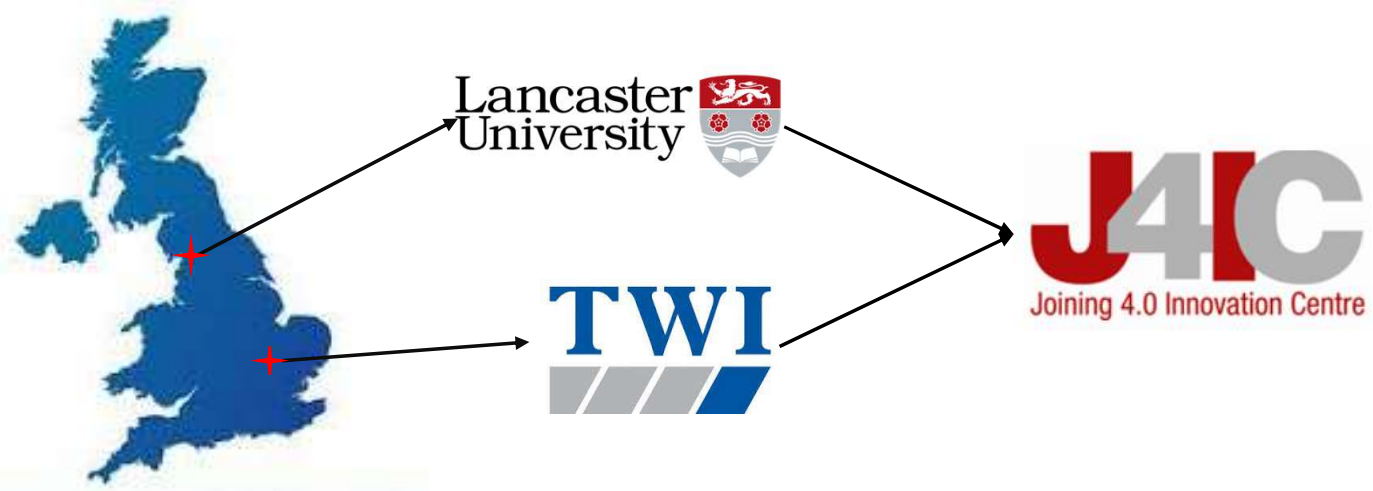
RESURGAM

MARI4YARD MARI4ALLIANCE

30th and 31st May 2023, RTD Innovation Dock, Rotterdam

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements n° 101006860 (FIBRE4YARDS), n° 101007005 (RESURGAM), and n° 101006798 (Mari4_YARD).

J4IC Overview



Our Expertise

- Artificial Intelligence
- Cloud Computing
- Advance Control Engineering
- Software Engineering
- Manufacturing Technologies
- Big Data

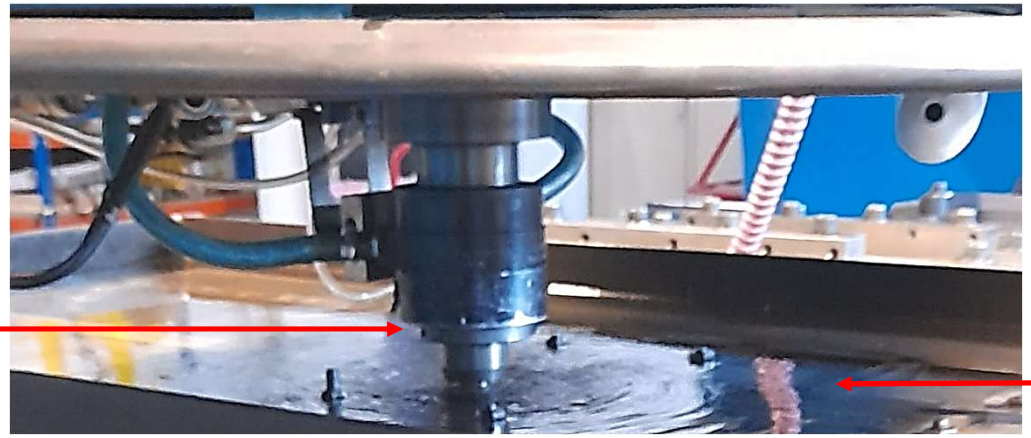
J4IC's Role

Robotic Survey Repair and Agile Manufacturing.

- **Development of Fault Detection Procedure using Artificial Intelligence.**

- **Industry 4.0 Compliant Data Integration Software**

Development of Fault Detection Procedure using Artificial Intelligence.



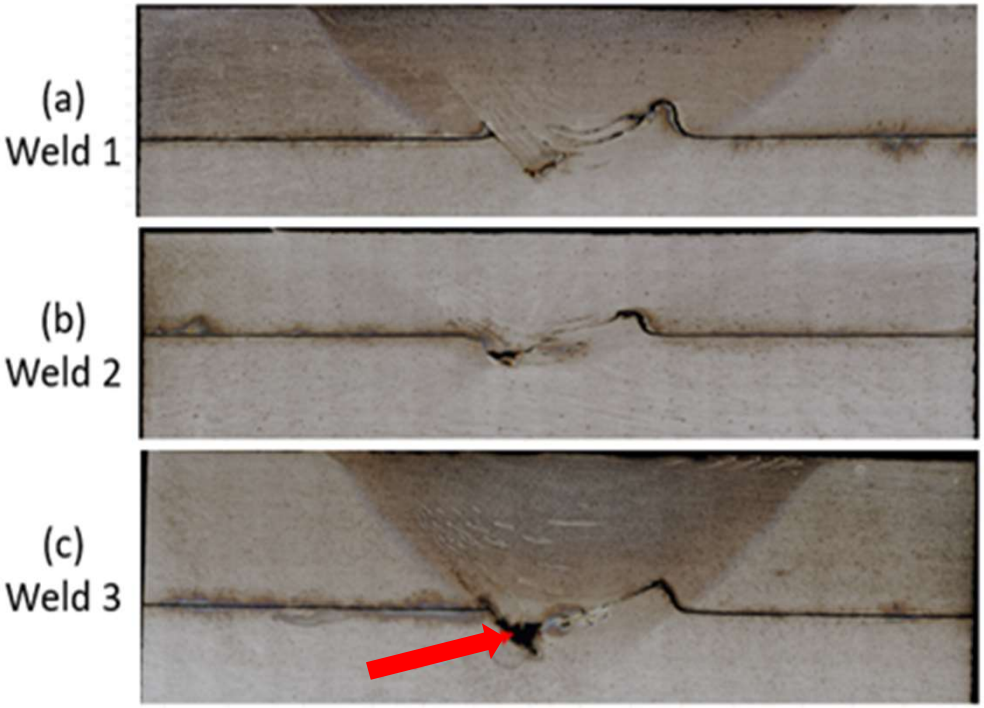
Problem:

- Operator need to track the condition indicators regularly during the welding process to flag out abnormal behaviour.
- Manually tracking is challenging
- Automate the damage detection procedure with Machine Learning (ML) algorithms

Approach:

- Use a combination of two Machine Learning algorithms in series to suggest damages.
- Recommend of the to avoid the occurrence of damages
- Industry 4.0 compliant technology

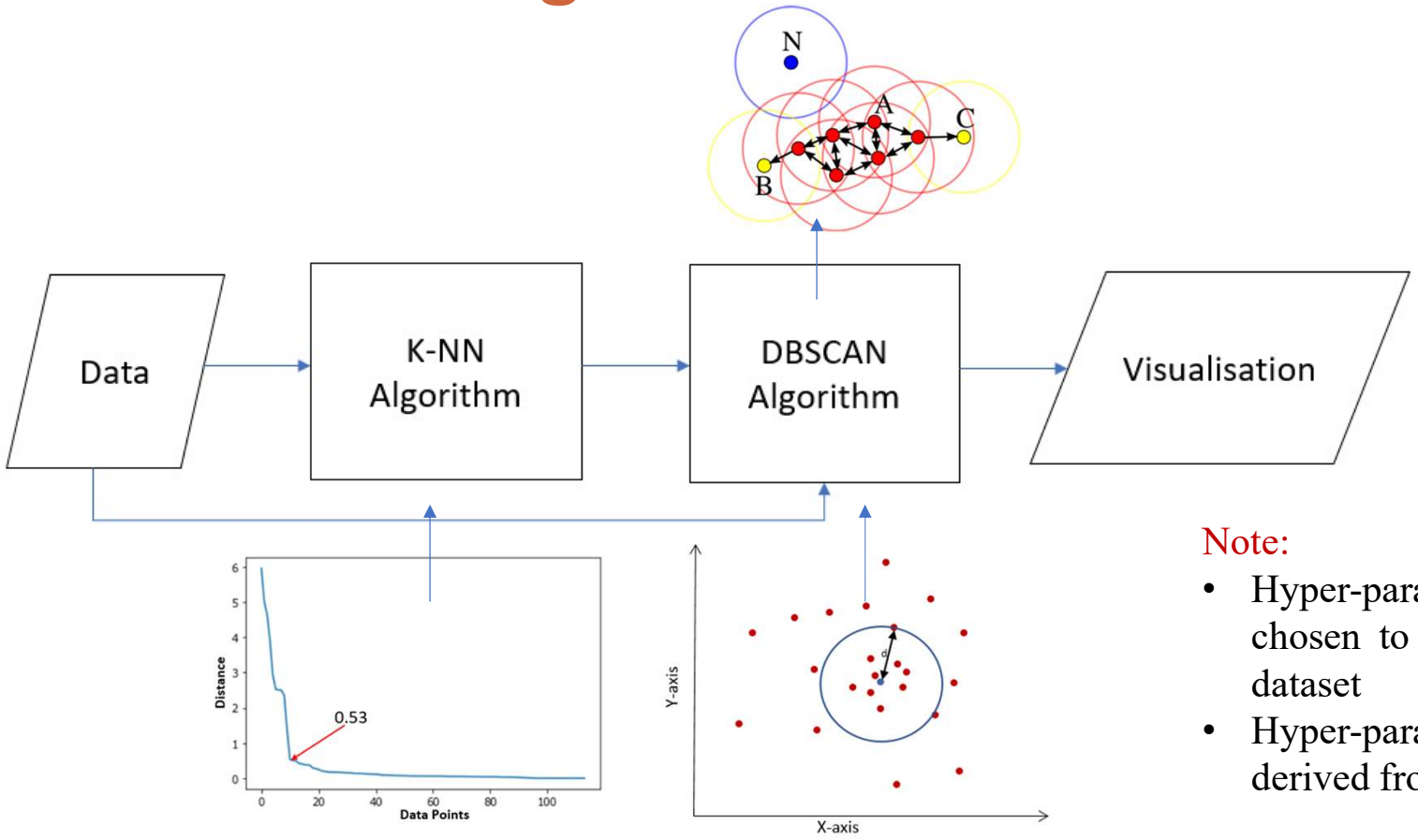
Development of Fault Detection Procedure using Artificial Intelligence.



Diverse welds

	Weld data & identification		
	Weld	Configuration	Medium
Good	3331-3 W14	Lap	Under water
Moderate	3331-3 W15	Lap	Under water
Bad	3331-3 W16	Lap	Under water
Bad	3331-3 W17	Lap	Under water
Bad	3331-3 W18	Lap	Under water

Development of Fault Detection Procedure using Artificial Intelligence.

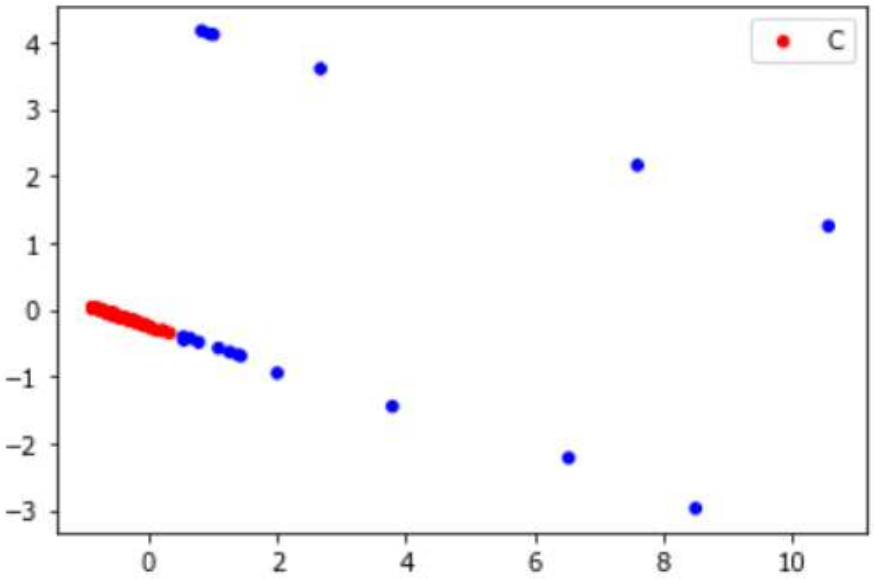


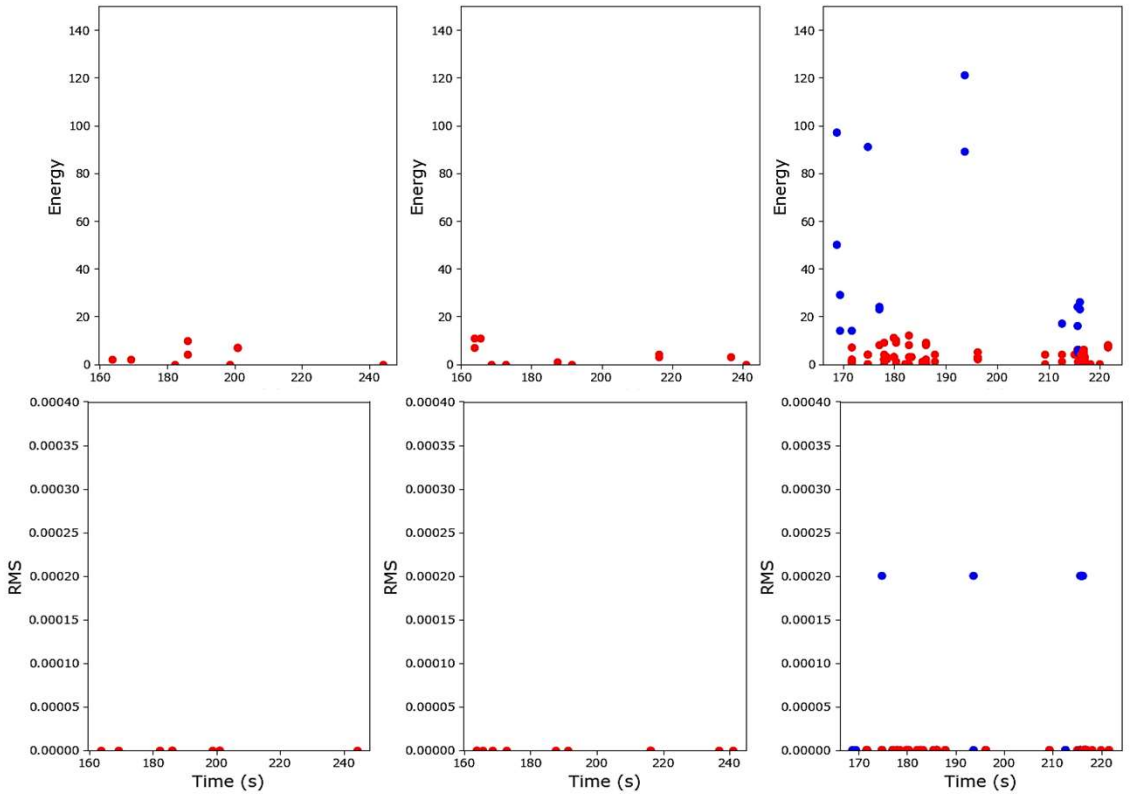
Note:

- Hyper-parameter MinPoints for DBSCAN is chosen to be 2 times the dimensions of the dataset
- Hyper-parameter Epsilon for DBSCAN is derived from K-NN Algorithm

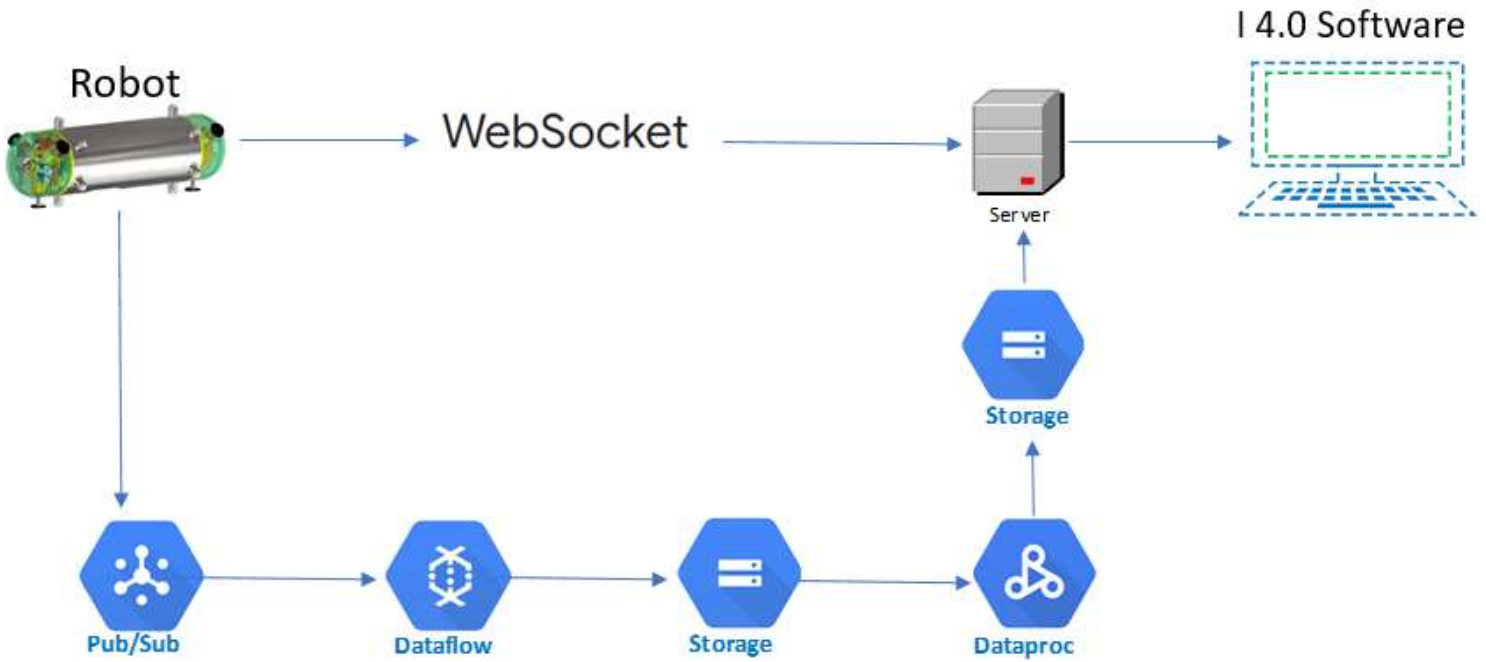
Development of Fault Detection Procedure using Artificial Intelligence.

1 cluster with 96 points
14 outlier points

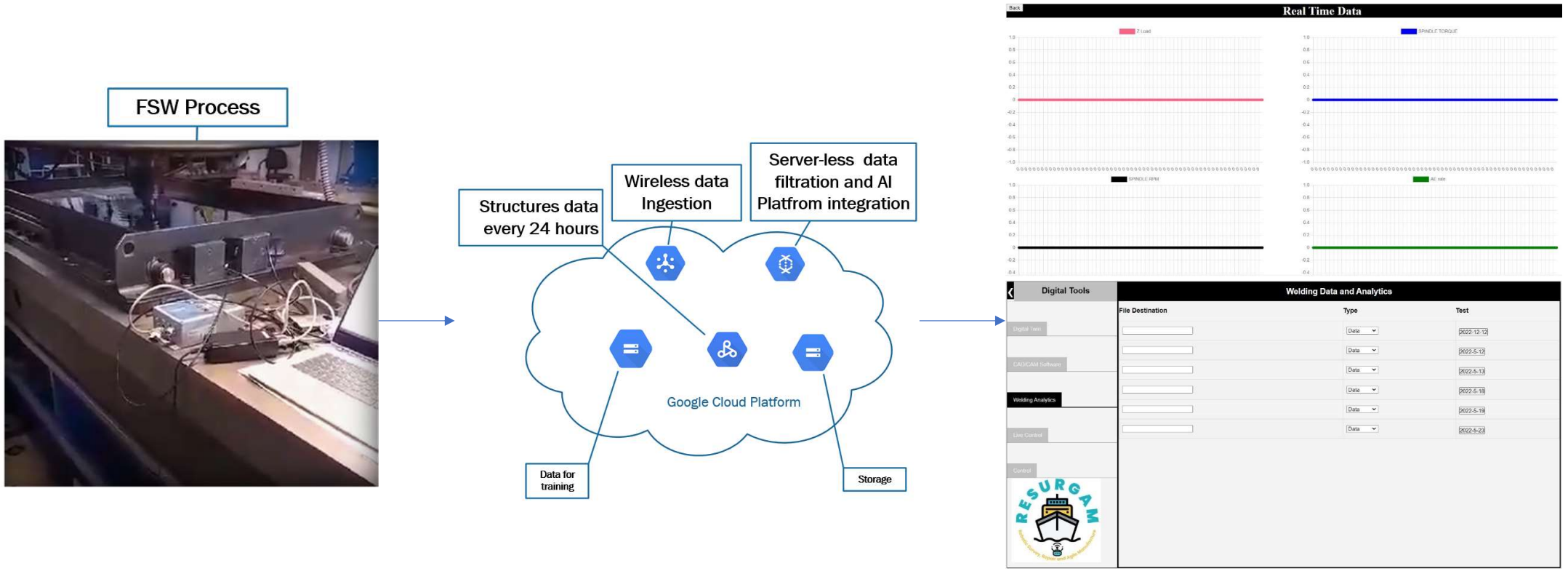




Industry 4.0 Compliant Digital Platform

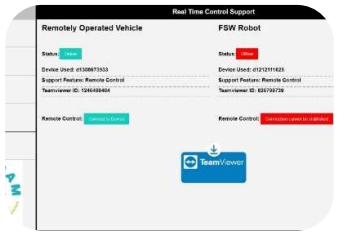


Industry 4.0 Compliant Digital Platform

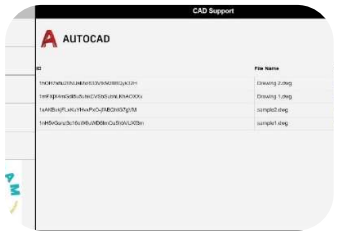


Industry 4.0 Compliant Digital Platform

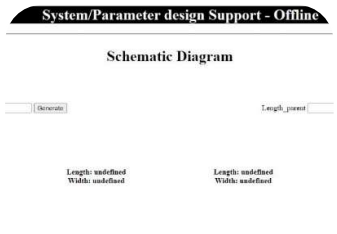
[Communication and Data Share]



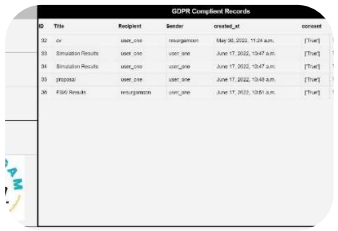
[Live Control through TeamViewer API]



[CAD support]

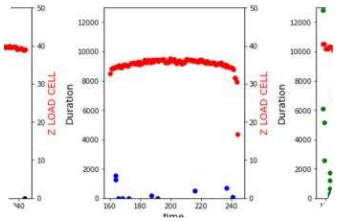


[System and Parameters design]

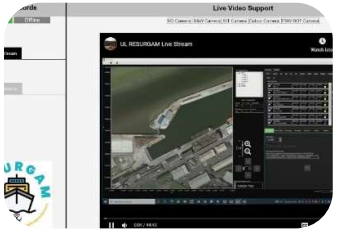


[GDPR compliant monitoring]

[Security of the RDP]



[Digital Twin]



[Live Video Support]

[Data analysis]

THANKS FOR YOUR ATTENTION

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