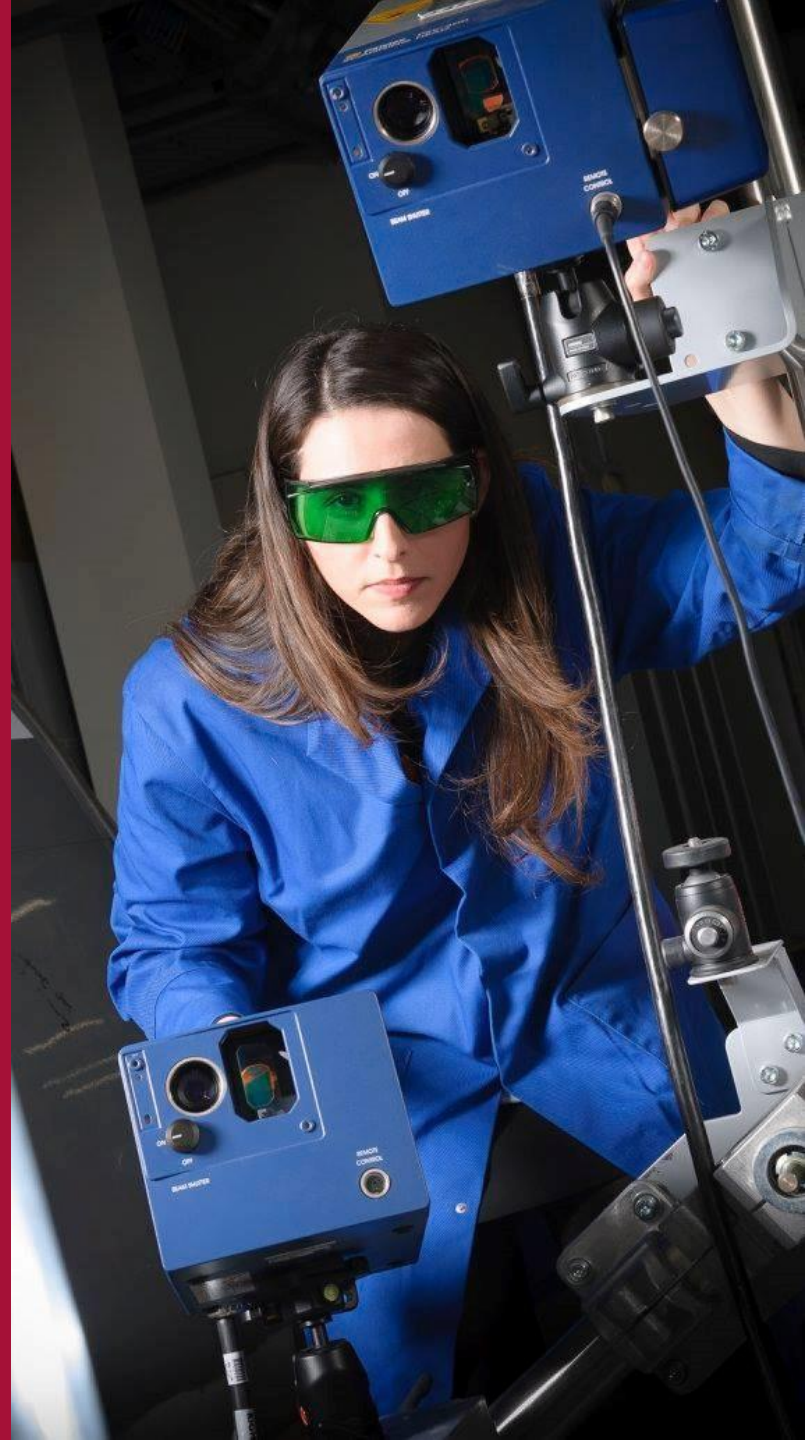


Brunel Innovation Centre

Digital Technologies



Optimisation of use of resources

Agritech

Pollution

Rotting prediction

Diagnosis Automation

Digital Healthcare

Diagnosis Support

Remote Healthcare

Structural Health Monitoring

Digital Twin

IoT sensing

Process Monitoring & Optimisation

Condition monitoring **Industry 4.0**

Inline Inspection

Non-Destructive Testing

Evolutionary Optimisation Algorithms

Image Processing

Deep Learning

Computer Vision

Signal Processing

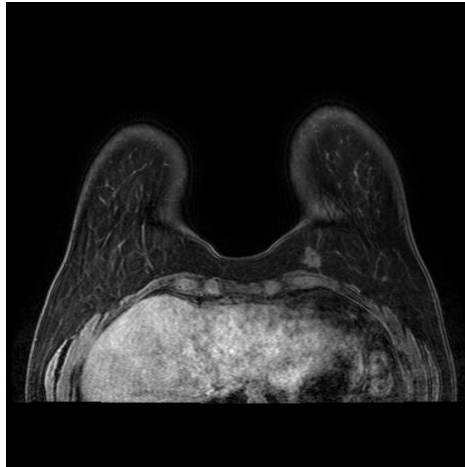
Vibration, Acoustic, Acoustic Emission

IoT DAQ

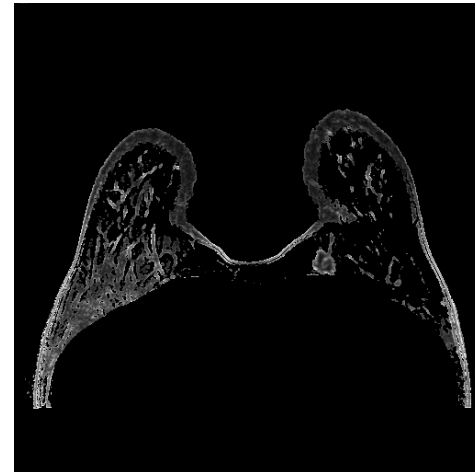
Fibre Bragg Grating Sensing

Ultrasonic, Ultrasonic Guided Waves

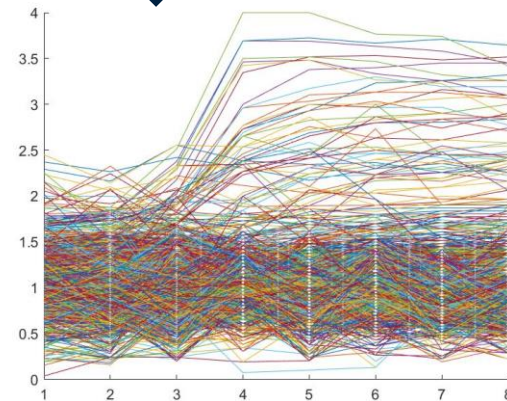
Breast Cancer Tumor Detection, Location and Classification using deep learning



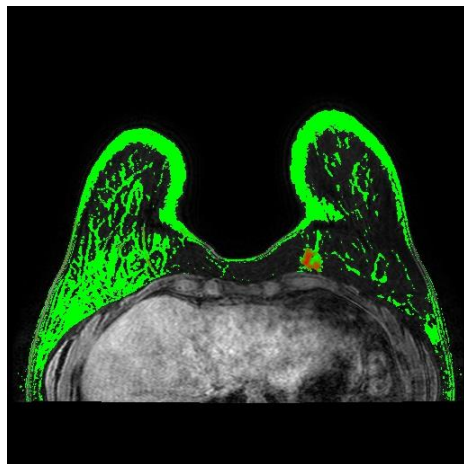
- Image normalization and segmentation
- Image pre-processing and denoising



- Pixel analysis
- Brightness normalization



- Deep Learning

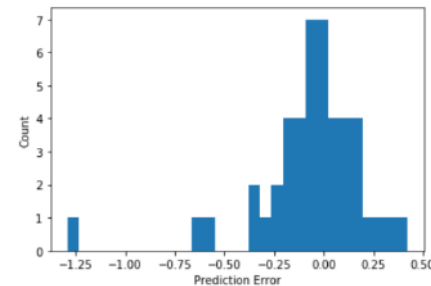
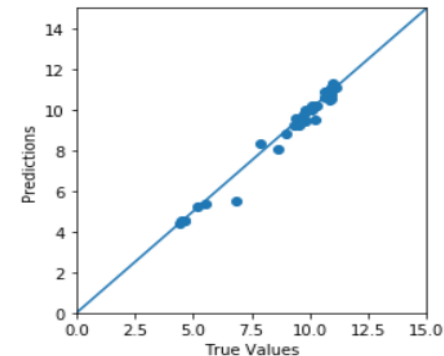
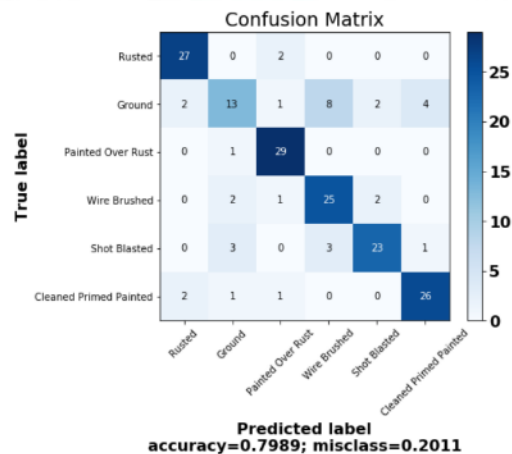


Automated Robotic Ultrasonic Inspection of Civil Engineering Metallic Structures



1solution: 3 models

- **Model 1** using machine learning for assessing the quality of the ultrasonic A-Scan and instructing the drone to repeat a measurement
- **Model 2** using machine learning for hidden surface classification
- **Model 3** using a combination of signal processing and machine learning for thickness prediction and corrosion detection



CITCOM: Automated Inspection of Medical MEMS using plenoptic camera and deep learning

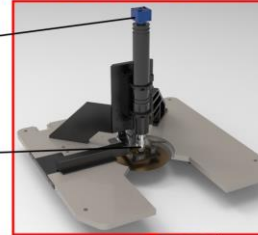


Shortlisted by the EC
Innovation Radar

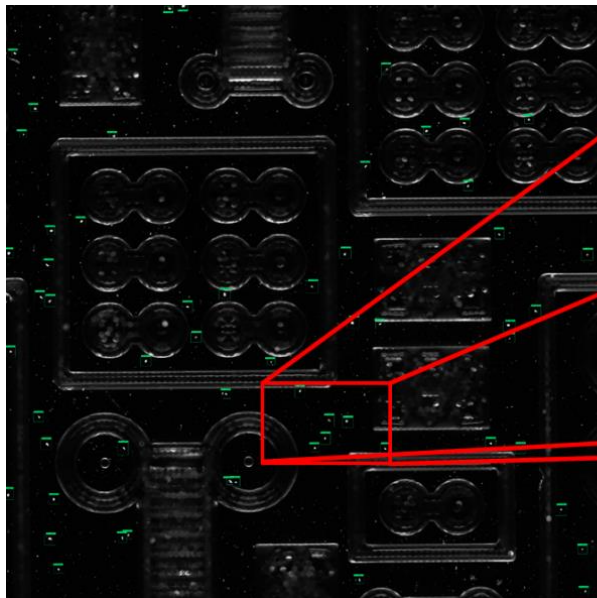
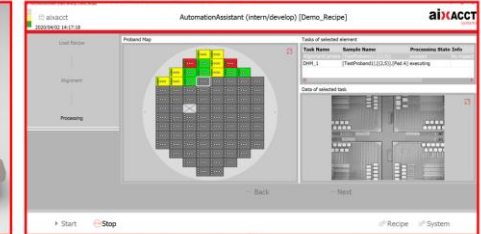
3D vision module

Plenoptic camera

Microscope objective



Graphical user interface

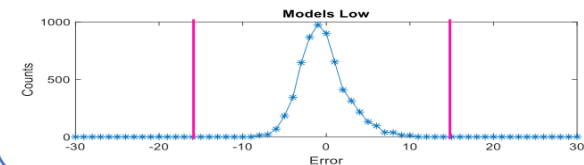


>95% accuracy detecting
10 categories of defects

Wind Turbine Digital Twin



Sensor Digital Twin: Error distribution between the Neural Network Regression Model of the sensor output and the real sensor data

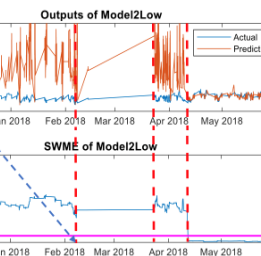


1. Modelling monitoring sensor output using regression model
2. Machinery fault detected 2 months before failure

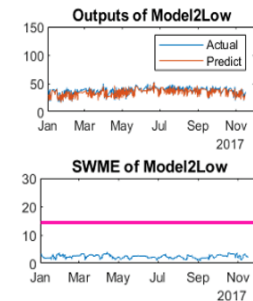
Wind turbine
stoppage

Fault detected 2
months before
stoppage:
The error between
the sensor data
and the model
(blue) exceeds the
threshold (pink)

Faulty Wind Turbine



Healthy Wind Turbine



Thank you

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