



LONGOPS RESEARCH & DEVELOPMENT OPPORTUNITIES

Supplier Engagement Event – 24th June 2021

UK Atomic Energy Authority

This work has been funded by the UK Government Department for Business, Energy & Industrial Strategy. No part of this presentation may be reproduced without permission. To obtain further information on the data and models underlying this work please contact PublicationsManager@ukaea.uk

Sensing & Perception in Unstructured Environments

Salvador Pacheco-Gutierrez (WP3.5 Lead)

Total Budget	Estimate Tender Publication	Estimate Contract Duration
~£1M	July 2021	September 2021 – August 2023

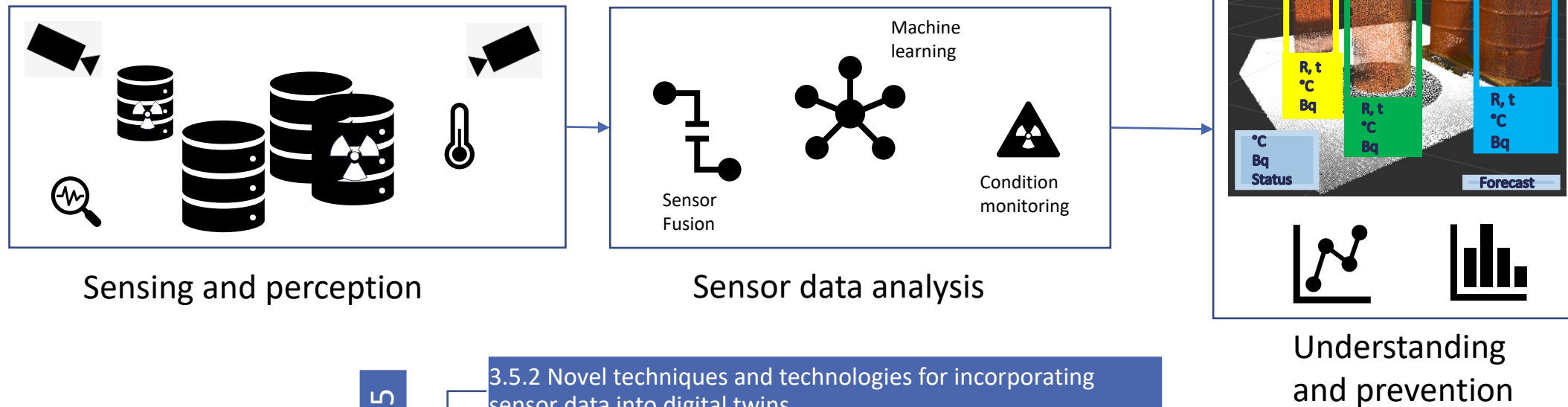
**For any questions please email:
enquiries@longops.race.ukaea.uk**

WP3.5 – Sensing & Perception to enhance awareness of unstructured environments

Planning and operating remotely in unstructured or uncertain (e.g. post-disaster) environments.

This work package aims at the R&D on integration of real-time sensor data into our digital twin to:

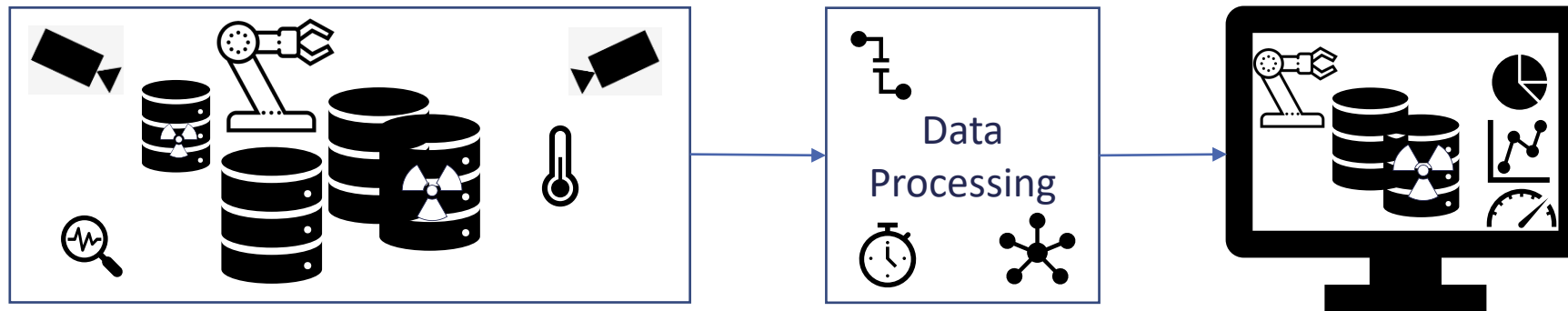
- Enhance awareness of the state of unstructured environments
- Estimate predictions based on gathered data
- Provide robust anomaly detection techniques



- WP 3.5
 - 3.5.2 Novel techniques and technologies for incorporating sensor data into digital twins
 - 3.5.3 Novel methods for automated change and anomaly detection

WP3.5.2 – R&D of novel techniques and technologies for incorporating sensor data into digital twins

Enhance the state-of-the-art in terms of real-time sensor updates to digital twins.



Requirements:

- Sensor fusion techniques
- Perception algorithms
- Tracking techniques
- Multiple sensor data integration
- Real-time updates

WP3.5.2 – R&D of novel techniques and technologies for incorporating sensor data into digital twins

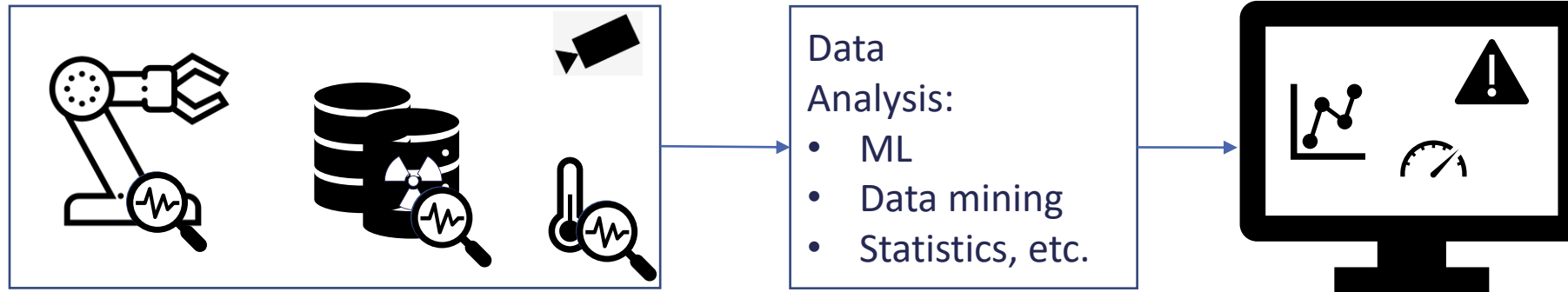
Desired skills:

- Digital twin technology
- Computer vision
- Sensor fusion
- Machine learning and AI algorithms
- Perception algorithms
- Robotics

A portfolio of successful projects and grants awarded on these fields is desirable.

WP3.5.3 – R&D of novel methods for automated change and anomaly detection

Develop novel methods for change and anomaly detection considering changes or modifications occurring in real-time as a result of the operations being conducted.



Requirements:

- Development of robust decision support tools for de-risking operations
- Finding patterns in data that do not conform to expected/normal behaviour
 - Physical attributes of objects (e.g. shape)
 - Signs of leakage
 - Material properties(e.g. corrosion)
 - Anomaly classification, etc.
- Prevent, detect and forecast:
 - Damage to equipment
 - Undesired system behaviour, etc.

WP3.5.3 – R&D of novel methods for automated change and anomaly detection

Desired skills:

- Digital twin technology
- Radioactivity monitoring
- Computer vision
- AI, machine learning and data mining anomaly detection algorithms
- Statistical analysis

Access to relevant nuclear facilities or mock-ups may be advantageous for this WP.

A portfolio of successful projects, grants awarded and a collection of publications on these fields is desired.