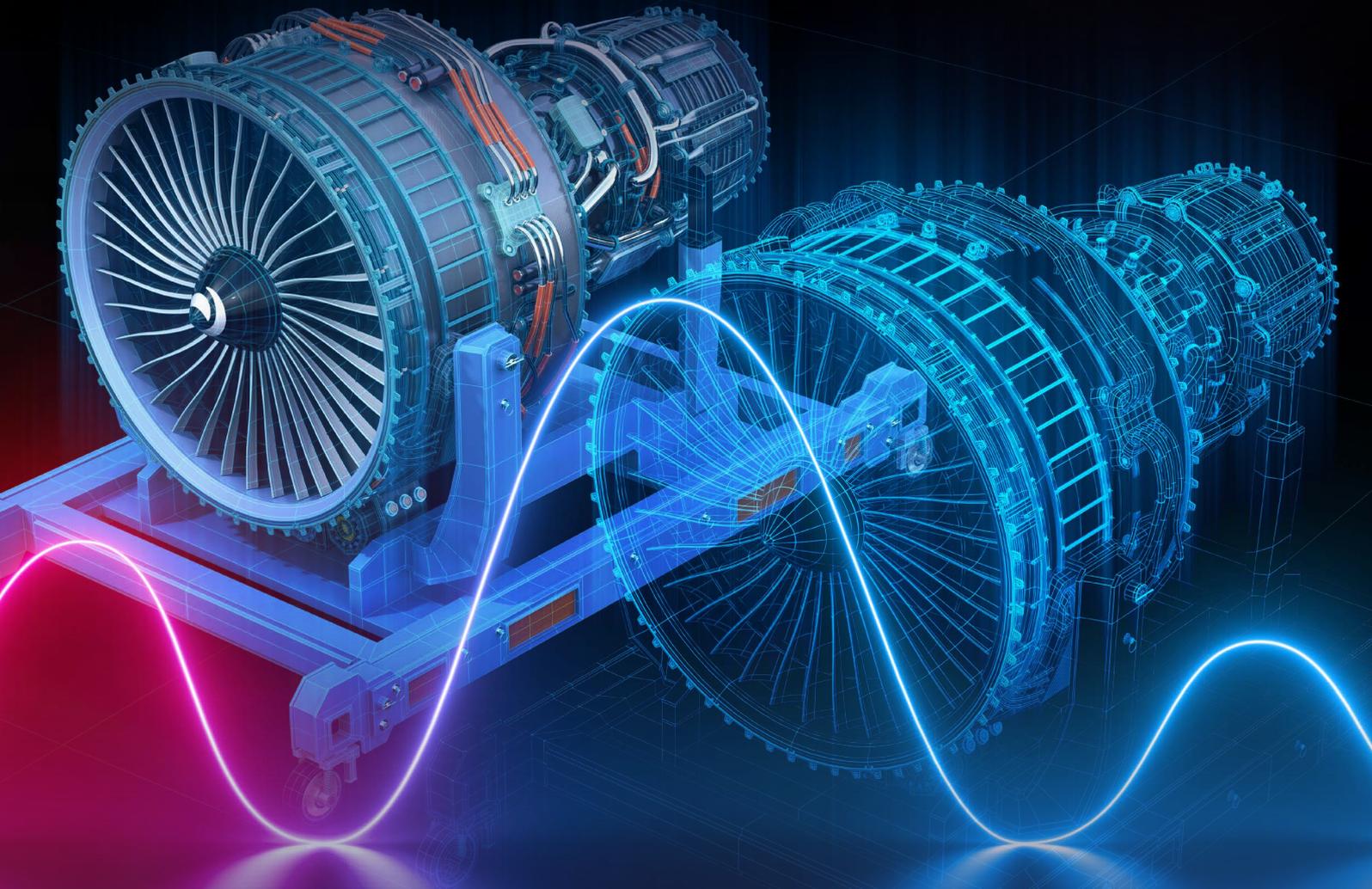


MARKET SECTOR:
VARIOUS



DIGITAL TWIN CONNECTED WITH SENSORS AND CONTROLLERS

A Connected Virtual Factory platform provides business insights into how an organisation's manufacturing systems and processes perform in real-time. It can also support analysis of data to identify improvements to performance, quality and safety.

THE CHALLENGE

Simulation techniques for manufacturing engineering enable accurate predictions to support decision making, but often require relatively long computation times in respect to production systems' process/cycle times.

Moreover, entering input data and interpreting the results are highly manual tasks, without connectivity to a system's sensors and controllers.

This makes most simulation techniques unfeasible for deployment in a connected fashion, as part of a digital twin framework, to support decision making for control actions during production.

MTC'S SOLUTION

The Connected Virtual Factory Environment allows simulation engineers to create and deploy lightweight surrogate models for process/manufacturing simulations, managing trade-off between speed, scope and accuracy, that has a nearly instantaneous execution time.

The generated surrogate model can be executed on the Connected Virtual Factory Environment, in a connected fashion, i.e. with a live digital coupling to a production system.

This allows the model to access sensor data as input to surrogate model, and link the model's outputs to decision making logic in the production systems' controllers and/or operators.

"CONNECTING MODELS AND SIMULATIONS WITH SENSORS AND CONTROLLERS MAKES FACTORIES SMART; PROVIDING THE CORRECT INFORMATION TO SUPPORT DECISION MAKING WHEN AND WHERE IT'S NEEDED."

DR EMILE GLORIEUX

Senior Research Engineer,
The Manufacturing Technology Centre

THE OUTCOME

With the Connected Virtual Factory Environment, sensors and controllers are digitally coupled with process and manufacturing models to make live predictions.

This enables analysis of sensor data in real-time; a better understanding of how production systems are performing; and informed control decisions to be made to improve ongoing operations.

Furthermore, the connected surrogate models can predict how systems will handle reconfigurations and variations. This has been demonstrated via three MTC use cases, where the Connected Virtual Factory Environment has been used to:

- Monitor and control temperature for forming, filling, and sealing blisters with pharmaceutical tablets;
- Measure and correct viscosity during mixing personal care products;
- Connect operation planning and reactive production scheduling.

BENEFITS TO THE CLIENT

Combining live sensor data with intelligent computer models allows for fine-tuning manufacturing processes to assure product quality, reducing defects and avoiding rework cycles.

Having live detailed insights of systems' operations to monitor performance can help reduce maintenance burdens and save associated costs.

Moreover, it will reduce risk of accidents and unplanned downtime through failure, thereby increasing reliability and availability.

The platform can also be used to support decision-making for operation control, leading to productivity improvements and increased yields.

To find out more contact the Digital Engineering Team via enquiries@the-mtc.org, or visit www.digitalmanufacturingaccelerator.com

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