TECH OFFER

Ai-Enabled Virtual Modelling For Reduction Of Energy, Carbon Dioxide Emission

KEY INFORMATION

TECHNOLOGY CATEGORY:
Infocomm - Artificial Intelligence
Infocomm - Computer Simulation & Modeling

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**
COUNTRY: **SINGAPORE**
ID NUMBER: **TO174749**

OVERVIEW

Manufacturing plants constantly seek opportunities to save energy, reduce cost, and be more environmentally sustainable. However, achieving these goals often requires heavy expenditure in the form of hiring teams of experienced engineers, who then perform cost-reduction tasks manually - this method is time-consuming, costly, and prone to inaccuracies due to the risk of human error.

This technology offer provides a no-code Artificial Intelligence (AI) powered platform that monitors energy consumption, carbon dioxide(CO_2) emission, and operational expenditures (OPEX) in real-time. The AI engine builds a virtual cognitive model (digital twin) of a physical asset, e.g. a manufacturing plant or a piece of machinary. Simulations are carried out on the model to predict operational inefficiency i.e. high energy usage, equipment breakdown, etc. Upon detection of inefficiencies, the engine is able to suggest the best operating parameters to resolve the inefficiency.

TECHNOLOGY FEATURES & SPECIFICATIONS

Monitoring:

- Tracks real-time operational data through sensor data from every equipment
- Monitors the lifecycle and performance (energy usage, carbon emission, operational expenditure)
- Predicts and alerts to potential equipment failures

Optimisation:

- Autonomously optimises the operational variables to prevent operational failures, reduce downtime, energy usage and carbon emission based on a user-defined thresholding value

Simulation:

- Software comprises a simulation capabillity to test if changes in specific operating parameters can cause knock-on issues or increase efficiency

The software platform can be deployed securely on-premise, private cloud, or public cloud. The technology can be paired with sensor solutions and 3D modelling software as end-to-end solutions to build digital capabilities in optimising and visualising operations/processes.

POTENTIAL APPLICATIONS

This technology offer provides an AI-powered cognitive digital twin that is applicable for all types of machinary used in manufacturing operations, and refineries in the following industries:

- Chemical
- Oil and gas
- Pharmaceutical
- Energy/Power

This AI-enabled solution is intended to assist in the autonomous reduction of downtime, operational expenditures, energy consumption, and CO2 emissions.

UNIQUE VALUE PROPOSITION

In comparison with conventional digital twin software which virtually represents physical assets with 3D models, and are commonly used as simulation, prediction, and life cycle monitoring tools. This technology can be differentiated in the following ways:

- Operates autonomously
- Does not need to be operated by specialised engineers with technical experience; workforce reduction
- Is not simply a complementary tool for analysis, operational oversight and decision-making
- Built-in AI engine acts, makes decisions autonomously to optimise throughput

The technology owner is looking to collaborate with machinary owners in the chemical and process industries, as well as original equipment manufacturers (OEM) and digitisation/digital transformation companies.