

Applications of Generative A.I. in Manufacturing Digital Twins

Andrés Paradela

CTAG

Automotive Technology Center of Galicia



CTAG – Automotive Technology Center of Galicia

- Private non-profit RTO in Spain, focused in the automotive sector
- 1.100 people
- Research line: Processes and Factory of the Future
- Support to manufacturing companies
- Capacity to 1) industrialize technology in the field and 2) R&D
- Comfortable in high TRLs, acting as interface with end users
- In AI-analytics, large trajectory with the Big Data project in the factory of Stellantis Vigo (Spain), exploiting data of millions of manufactured cars.

ADRA Digital Twin for Manufacturing TG



The AI Data Robotics
Association

- Digital Twin: relevant and multidisciplinary topic in manufacturing
- Relevant group of technologies that impact to optimize energy consumption, optimize parameters, improve quality, increase efficiency and resilience.
- Involves modelling, sensing, interoperability, infrastructure, Human-Computer Interaction, Cybersecurity, standardization and sustainability.
- Applications in the optimization-scheduling, big data and quality domains.
- Message: a new ADRA workgroup is in process of creation to handle this field.

Generative AI in Manufacturing Digital Twins

POTENTIAL USE CASES

- Overall Generative AI can generate alternative scenarios while manufacturing, to evaluate potential improvements as a “parallel” brain of the factory.
- This is related with Quantum Computing and other technologies to allow a real-time behavior.
- Optimization: scheduling of production, generating alternative flows and different factory configurations (generative design of 3D content).
- Quality: looking for data correlations, generating synthetic data, generating images to boost creation of AI models, non-structured documents search.
- In HMIs to humanize-verbalize the interaction with the digital twin.

Generative AI in Manufacturing Digital Twins

• CHALLENGES / BARRIERS

- Lack of digitalization in manufacturing companies. Interoperability.
- Lack of data / AI culture.
- Lack of standardization in digital twins, formats, models...
- Cybersecurity.
- Licenses cost, and lack of a clear ROI.
- Lack of clear applications to apply Generative AI.
- Lack of pilots / documented cases / references to apply Generative AI.

Applications of Generative A.I. in Manufacturing Digital Twins

Andrés Paradela

CTAG

Automotive Technology Center of Galicia



Thanks !!