

IOT WEEK

Innovating in the era of Trustworthy Al DIVERSE June 20-23, 2022

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Innovating in the era of Trustworthy Al



- Challenges and opportunities and recommendations to develop a truly trustworthy AI ecosystem in the manufacturing sector
- Trustworthy AI in wider context (technological, regulatory, business) (in particular tackling Data and Trustworthy AI)





Interoperability and AI trustworthy MAS4AI



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MAS4AI: Project presentation and objectives



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MAS4A





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MAS4AI Objectives –AI technologies

- O1 Development of a Multi-Agent-System (MAS) for distributing AI components in different hierarchy layers
- O2 Development of AI agents using Knowledge-based Representation with Semantic Web Technologies
- O3 Development of AI Agents for hierarchical planning of production processes
 - Development of model-based Machine Learning (ML) AI agents
- O5 Test, Validation and Dissemination of the Multi-Agent System on agility and safety in manufacturing

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MAS4AI Testbed and five industrial pilot cases





SmartFactory^{KL} I4.0 Modular Testbed



Volkswagen AG Car Production



VDL Industrial Modules





Baltik Vairas bicycle production



SCM Wood processing



sa Bearings production

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FERSA industrial case: Bearing production





Bearings Case – Manufacturing Process MAS4Ai



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FERSA use case: AI technologies



- Deep Learning methods, more particularly Deep Neural Networks have been applied using Tensorflow framework. The main reason is that data used in MAS4AI project is heterogeneous and massive. Since the amount of entries of different type is huge, and the size of the dataset are also truly big, the use of DNN accelerate the training of the model.
- The main challenge is we have many machine parameters to give as response, so DNN offers us a good balance between fast response and management of all parameters.
- The use of DNN give us the opportunity of focusing in fast training models without forgetting the deployment in the MAS system.



Challenges and opportunities and recommendations to develop a truly trustworthy AI ecosystem in the manufacturing sector



- Data access
- Heterogeneous data: Amount of entries of different type is huge
- Data preprocessing: Size of the dataset are also truly big,
- Process modelling: It is specific for each process
- Scalability: Transfering AI agents from one process to another
- Human (Operator) participation.







Thank you for your attention! OTOGECK Dublin June 20-23, 2022 Luis Usatorre

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Thank you for your attention!

BACK UP SLIDES





Artificial Intelligence for Manufacturing Pathway





MAS4A

Multi-agent AI system

- Diverse AI technologies and combinations: knowledge-based, hierarchical planning and model-based machine learning
- Al components in different hierarchy layers
- Unified, reusable and scalable solutions

Autonomous modular production

- Semantic Self-description capabilities of technical modules, optimization of configurations and processes
- Human assistance with awareness of human capabilities
- Highly reactive and safe solutions

Implementation, benchmarking and demonstration in industrial pilot cases

- Real manufacturing conditions
- Across different market sectors

Connection to existing platforms and European networks

Integration and deployment of AI components

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