

**HARMONIZED AI & DOMAIN EXPERTISE
ON
INTEGRATED DATA INFRASTRUCTURES FOR
INDUSTRIAL SYSTEMS**

ORGANISATION PROFILE

Melina Aero Technology Development and Design Corp. was founded in 2016 within ITU Arı Technopolis by Prof.Dr. Onur Tuncer. Melina Aero is developing model-based design and simulation software (FlowNetMaster) for the creation of digital-twins of physical systems. Melina Aero is a micro-scale SME with five employees, a multi-disciplinary team with mechanical and electrical engineers, a computer scientist and a graphical designer.



FlowNetMaster
www.flownetmaster.com

PROPOSAL INTRODUCTION

Vision: We propose a dual approach to address these shortcomings and enable more efficient usage of AI-powered tools within an industrial setting

Motivation: Current implementations of smart (AI-powered) manufacturing systems in the industry are quite limited in scope, highly sensitive to quality of data collection and management flow and overall lack the support of domain knowledge and physics-based modeling. These shortcomings prevent such methods from gaining widespread usage and limit the degree of automation that can be exploited by implementation of AI-powered methods. Integration of cloud services, data security, novel software development and hardware implementations are also of concern to our proposed project effort.

Content:

- Integrated Design of IoT Network, Data Management and Machine Learning Pipelines
- integration of domain knowledge and Physics-Based Models with AI-powered Systems

POSSIBLE USECASE

Expected outcome: Energy management in industrial plants is a challenging issue. Even a small percentage reduction in energy consumption translates into huge savings. Artificial intelligence should not be trusted alone as it can sometimes lead to unphysical (even possibly catastrophic) results, therefore reinforcing model based control with AI can lead to enhanced energy efficiency without risking any undesired outcome.

Impacts:

- Physics based digital twin in collaboration with AI based controller
- AI learning from both the physical system and its digital twin
- Possible to implement model based control, rule based control and AI within the same system
- AI-based Energy Management Module for an Industrial Plant
- Scalable solutions
- More intelligent plant

Schedule: 30-36 months

PARTNERS

Current

Turkey

- Melina Aero (Project Coordinator)
- Tosçelik (Steel Manufacturer & Use Case Provider)

Partner search:

Different use case providers

SMEs with data and/or AI focus

Universities



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