CELTIC EUROGIA
Online Proposers Day

15th & 16th September 2020

Pitch of the Project Proposal

HARMONIZED AI & DOMAIN EXPERTISE ON INTEGRATED DATA INFRASTUCTURES FOR MANUFACTURING SYSTEMS

MelinaAero
" Teknolojinin Kara Kutusu "

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eureka
innovation beyond borders

Teaser

Challenge:

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.

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

Project Idea: We propose a dual approach to address these shortcomings and enable more efficient usage of AI-powered tools within the manufacturing industry

1.Integrated Design of IoT Network, Data Management and Machine Learning Pipelines:

- These modules are usually developed independent of each other, which leads to severe architectural limitations and performance gaps in real applications. As the project consortium, we shall develop novel architectures and methodologies for integrated design of data flow and machine learning pipelines that are suitable for highly automated AI-powered manufacturing systems.

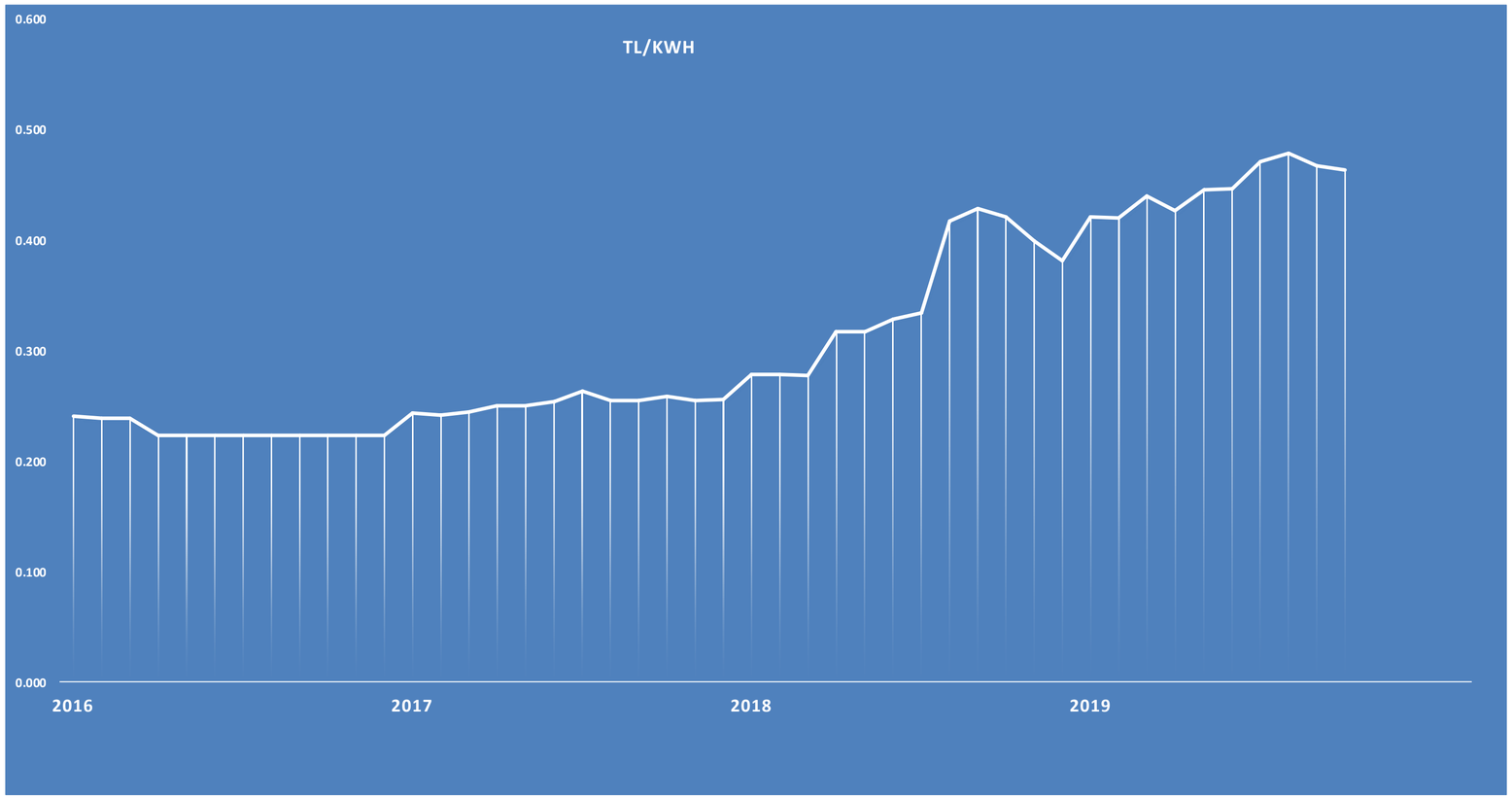
2.Integration of Domain Knowledge and Physics-Based Models with AI-powered Systems:

- Current AI systems are completely data-driven, which increases the amount of samples required for even simple tasks and does not have any robustness or feasibility guarantees in terms of the physics of the environment. Project consortium will develop novel ML methods that can leverage the existing domain expertise and physics-based models to improve the sample complexity and offer robustness guarantees for safe operation of automated manufacturing systems.

Developed ideas will be validated on real-world use cases provided by the industrial partners of the project.

Proposal Introduction

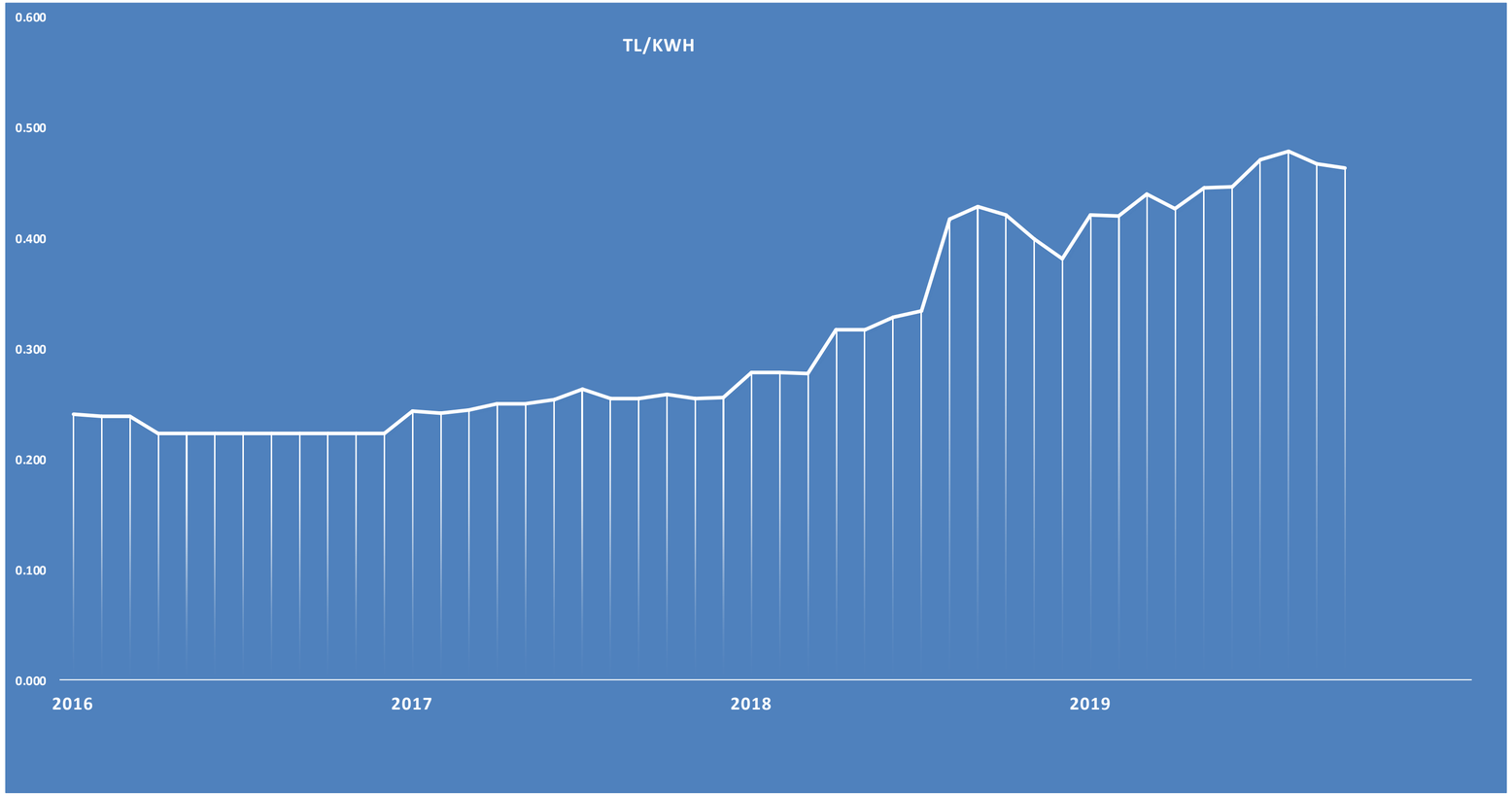
Use Case 1: Borçelik-Energy Efficiency



- To apply combination of ICTs (Big Data Analysis , IoT , DT and AI) in order to control the major parameters which are highly effective in electricity consumption for a rolling mill.
- By this approach, energy consumption reduction could be realized as well as having environmental footprint reduced.

Proposal Introduction

Use Case 2: Vestel - TV



- A use-case for the automation of some manual decision steps that require expertise in the testing stages of the TV, one of Vestel's important products.
- The optic tests are most critical tests and need expertise. There are some stages that are approved by the human eye by looking at some parameters such as color shift on the screen. All necessary variables can be parameterized in this decision mechanism. Here, an AI can be trained for all situations detected by a human, and the decision-making mechanism can be automated with the machine learning for the testing process.

Partners

Existing consortium, involved countries:

- Turkey (Turkish consortium is completed.)
  - Melina Aero (Project Coordinator)
  - Borçelik (Use Case Provider)
  - Vestel (Use Case Provider)
  - Istanbul Technical University (Sub-contractor)

We are looking for:

- Different use case providers
- SMEs with data and/or AI focus
- Universities

HARMONIZED AI & DOMAIN EXPERTISE

Please choose :

Consortium Building Session

In the 4th week of September we will schedule a follow-up telco for your new project idea. Please fill in your availability soon as possible but at the latest by 13th of September.

This session will be announced on the Online Proposers Day .

https://polls.eurescom.eu/Consortium_Building_Sessions_September_2020/

Contact Info

For more information and for interest to participate please contact:

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Presentation available via:

17 Sept. 16.00 CET
Join the follow-up Telco

Join Webex meeting
Meeting number (access code): **163 617 3383**
Meeting password: **jdBpiTdv936**

Join by phone
+49-6925511-4400 Germany toll
Global call-in numbers

Can't join the meeting?