

Ecological Motor Control and Predictive Maintenance with AI

USE CASE

MODEL-BASED DESIGN FRAMEWORK FOR ECOLOGICAL MOTOR CONTROL AND PREDICTIVE MAINTENANCE WITH ARTIFICIAL INTELLIGENCE

Enhancing the system development of semiconductors and motor controls: This acceleration potential can be achieved with model-based system architecture. Addressing the complexity across the entire development stack including Artificial Intelligence, a defined and transparent methodology is the fundamental base.

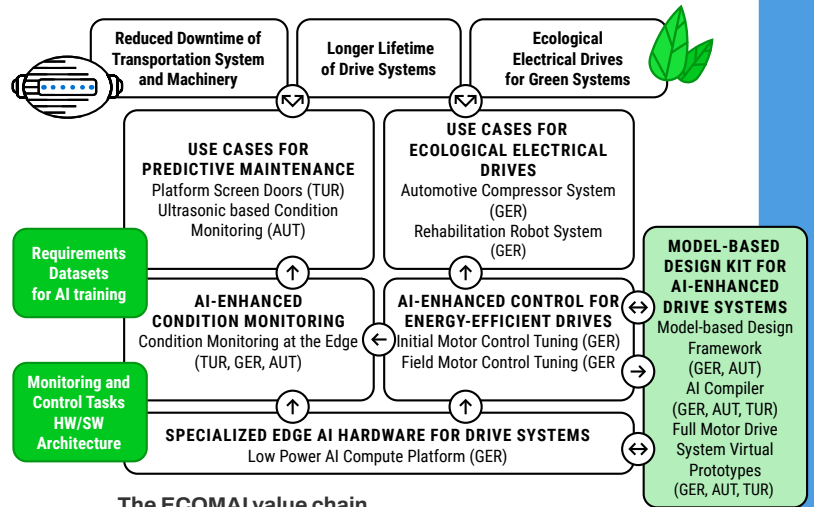
We from Sparx Systems propose in the ECOMAI context the development within a model-based design framework. It differs fundamentally from the now often used text-based approaches.

The methodology of modelling the system architecture within a defined design framework includes standardized languages for clarity, a single point of information for less

redundancies, a visualization of data and its architecture, automated processing of model data as well as a semantic control through simulation. This results in a faster development for more security and energy efficiency.

GOAL: INNOVATING A MODEL-BASED DESIGN FRAMEWORK FOR MOTOR CONTROL AND PREDICTIVE MAINTENANCE

The proposed methodology consists of a model-based design framework with a defined domain model and modelling language



The ECOMAI value chain

MARKET NEEDS ADRESSED

- The development of AI-enhanced systems is a rapidly growing, with applications in industries such as automotive, aerospace, and robotics.
- No AI specific, model-based design frameworks currently available in the market for the TinyML – field. The ECOMAI Development kit fills this gap, combining scientific research and industry best practice.
- The use of dedicated frameworks allow shorter and less-costly development cycles, leading to more secure systems for motor control and predictive maintenance.

ge. The co-development within the ECO-MAI project with its scientific and industry consortium partners give insight into all relevant information entities and their interrelationships including Artificial Intelligence. It allows to cover the development cycle from system design to engineering test benches and technology demonstrators.

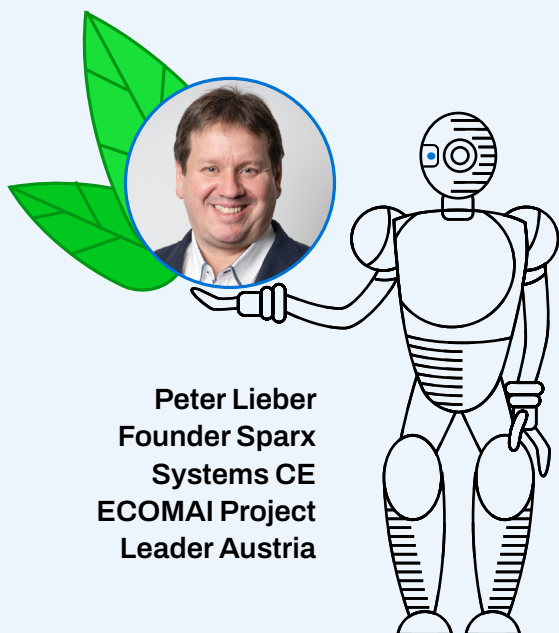
COMMERCIAL VIEWPOINT

A model-based design framework for AI-enhanced drive systems and predictive maintenance can provide a powerful tool for optimizing the design and performance of these systems. It leads to improved performance, efficiency, and reliability. In addition, the framework can help reduce development time and costs by providing a simulation environment for testing and validation before physical implementation. This can significantly reduce the time and cost associated with developing new systems and can help companies bring their products to market faster.

Overall, the market opportunity for a model-based design framework for AI-enhanced drive systems is expected to be significant, as companies continue to invest in AI and machine learning technologies to improve their products and gain a competitive edge in their respective markets.

CONSORTIUM PARTNER INDUSTRY

Sparx Systems CE represents “Enterprise Architect” in Europe. With over 1Mio licences globally, Enterprise Architect is in use for Systems Engineering (MBSE), Enterprise Architecture Management (EAM), Software Development, Business Process Modelling and Data Architecture. It covers the entire cycle from requirements gathering to the analysis stages, design, testing, maintenance and documentation. As a comprehensive analysis and design tool for 80+ modelling languages (SysML, BPMN, ArchiMate, UML, ..) it enables team-collaboration with its business suite Prolaborate.



Peter Lieber
Founder Sparx
Systems CE
ECOMAI Project
Leader Austria

“ We take part in the ECOMAI project to co-develop a model-based framework for AI with strong consortium partners from academia and industry. This approach enhances clarity, reduces redundancies, and accelerates development, providing practical benefits for the entire ecosystem, including more secure and efficient systems. ”



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