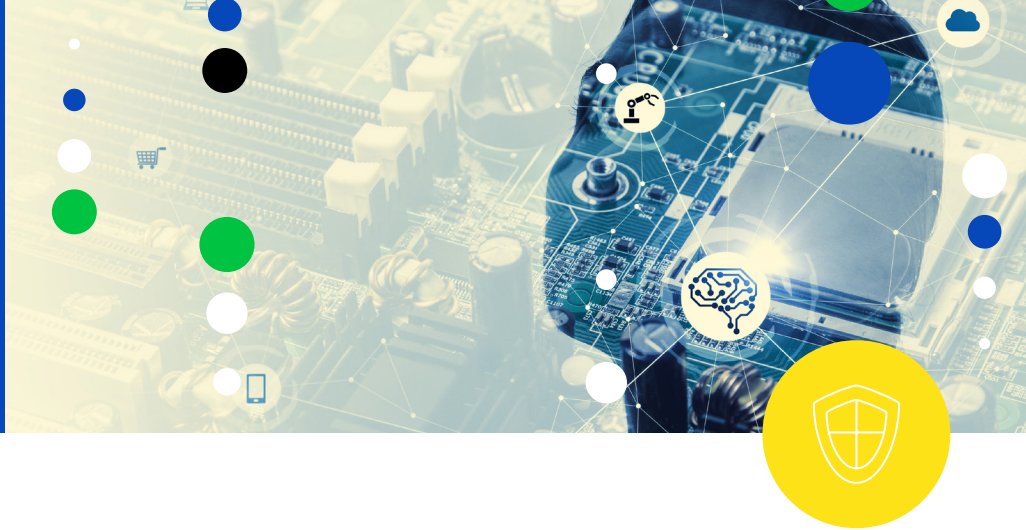
ITEA 4

Project Profile



IML4E

Transforming domains with machine learning automation

To unlock the automation potential of artificial intelligence (AI) and machine learning (ML), the Joint AI Call 2020 project IML4E (Industrial Machine Learning for Enterprises) will develop methods, tools and a framework for the creation and maintenance of smart software solutions.

Addressing the challenge

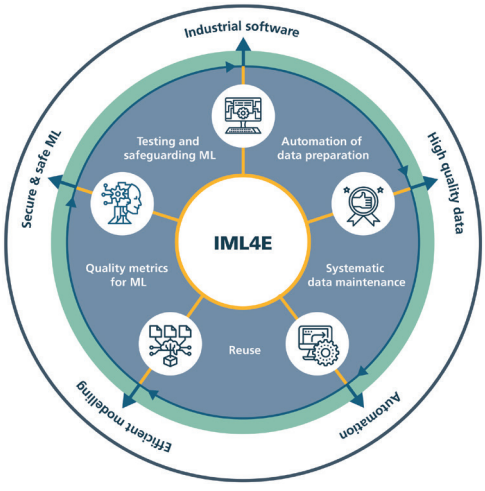
Smart software solutions containing AI and ML could automate previously non-automatable processes such as predictive maintenance, automated driving and clinical diagnosis. However, such solutions must integrate with other software and communication technologies and meet both established quality characteristics (functionality, security, maintainability, interoperability) and emerging ones (interpretability, intelligent behaviour, fairness), all of which must be planned, realised, validated and maintained over the full system lifecycle. The fundamental differences in the development and operation of AI and ML software from traditional software development render it difficult to integrate AI and ML with existing processes.

Proposed solutions

In order to provide interoperability, automation and reusability to ML development and operations, IML4E will develop the IML4E Framework for ML system design, implementation and operations management. This will encompass five main technical innovations:

- High-quality, interoperable data preparation infrastructures for trustworthy ML.
- Scalable Machine Learning and Operations (MLOps) techniques and tools for critical application domains.
- An MLOps methodology to integrate ML, data science and best practices.
- An experimentation and training platform for integrating I4ML methods and tools with open-source solutions.
- Pre-standardisation work on cross-domain engineering for AI systems.

As a result, the project aims to boost automation, interoperability & tool support throughout the ML and software lifecycle, improve the modularity & reuse of development & data artefacts to enable higher productivity and promote the seamless integration of tools, methods & techniques from data science, ML & traditional software engineering. This will enable continuous quality assurance and supervision for different types of ML throughout a smart software solution's lifecycle.



The IML4E Framework to boost automation, interoperability, modularity & reuse throughout the MLOps lifecycle.

Projected results and impact

Digital transformation is predominantly dependent on the use of AI and ML applications and the ability of industries and organisations to adopt them efficiently within their production environments. By enabling ML automation and integration, IML4E aims to make smart software production more efficient, scalable & manageable and ML-based products and services more reliable, safe, secure & trustworthy across Europe. For end-users, the project expects to increase the automation level of data preparation by 30% and accelerate related processes by 20%. By reusing ML artefacts, the number of errors in smart software can be reduced by 20%, lowering ML-based smart software costs by 15% and decreasing time to market by 10%-25%. This also serves as a competitive opportunity to expand into the rapidly emerging MLOps market, which is predicted to grow from USD 350 million in 2019 to almost USD 4 billion by 2025. By fostering standards to harmonise tools, methods and formats for the development and operation of ML-based solutions, IML4E will ultimately empower the European software industry to efficiently produce high-quality AI and ML solutions for the foreseeable future.

Project partners

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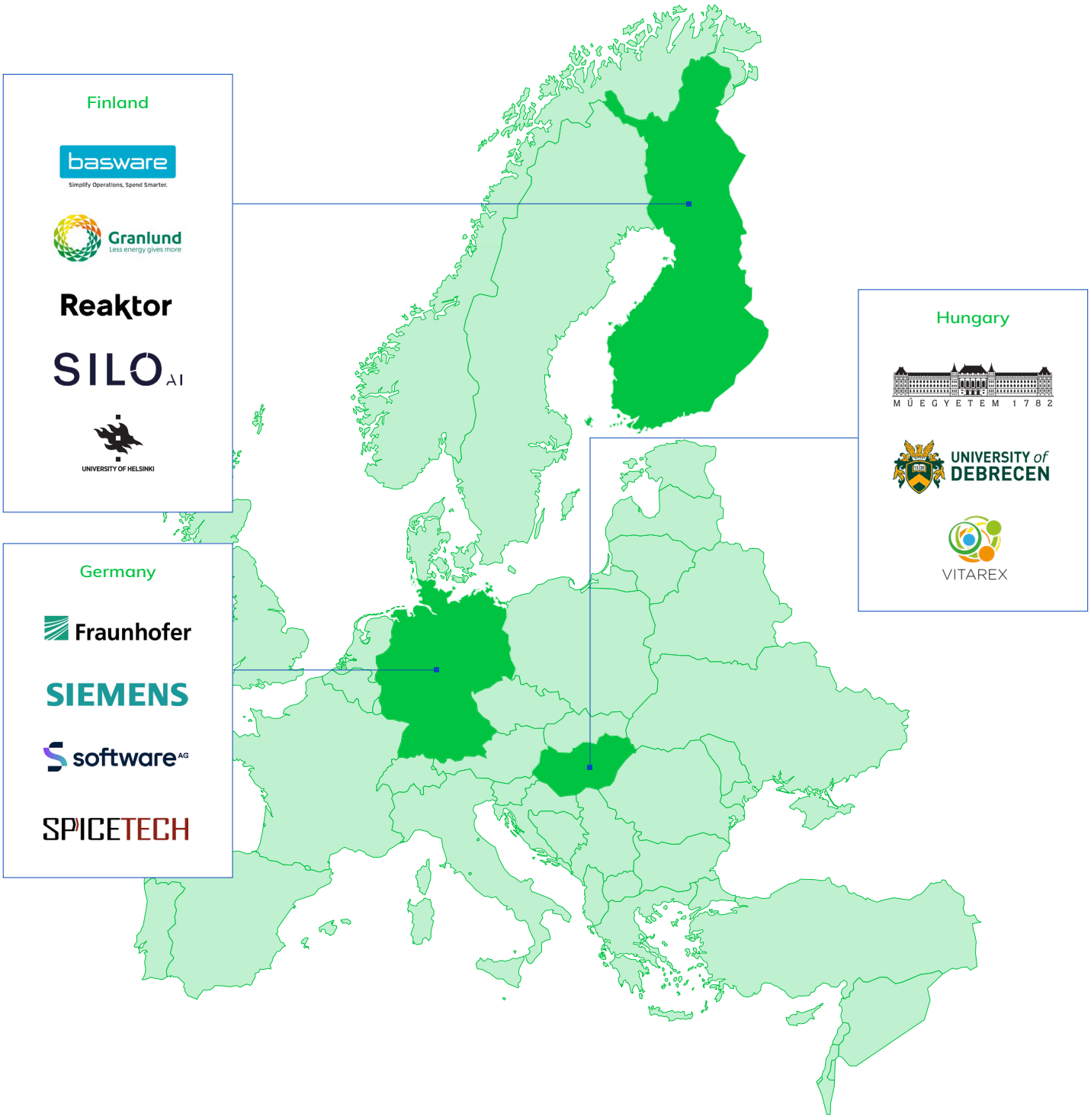

Project start
May 2021

Project end
May 2024

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Project website
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ITEA is the Eureka R&D&I Cluster on software innovation, enabling a large international community of large industry, SMEs, start-ups, academia and customer organisations, to collaborate in funded projects that turn innovative ideas into new businesses, jobs, economic growth and benefits for society. ITEA is part of the Eureka Clusters Programme (ECP).

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