ITEA 4



Project Profile

CLEAR

Harnessing the industrial potential of multimodal AI techniques

By leveraging advanced artificial intelligence (AI) techniques, the ITEA project CLEAR (Comprehensive Learning for Enhanced AI Responsiveness) will boost the capabilities of large multimodal models (LMMs) and large language models (LLMs) to efficiently manage complex data inputs and enable reliable decision-making.

Addressing the challenge

Multimodal AI techniques have shown great industrial potential but face challenges in both integration and trust. For integration, many industries work with diverse data sources for which differences in representation, format, and scale can lead to misinterpretation or retrieval issues. Regarding trust, AI hallucinations can compromise decision-making, pose safety risks, and impact user confidence, especially in safety-critical and decision-intensive industrial environments. Many companies therefore rely on traditional methods.

Proposed solutions

CLEAR's mission is to tackle the hurdles of integrating multimodal data into AI systems and making their outputs more reliable for industrial applications. Firstly, the project will develop new methodologies for multimodal integration and fusion of unconventional data types into AI systems, based on LMMs and LLMs, to process diverse inputs effectively. This can be achieved, for instance, using knowledge graphs to represent and link data points across different modalities. Secondly, a comprehensive LMM pipeline will transform user requests into prompts, structure existing knowledge, collect real-time data, and output meaningful responses. This CLEAR multimodal pipeline will allow users to post a multimodal question, such as text with an image, and enable the LMM to reply by adding a diagram, for example. The LMM will be fine-tuned on company-specific data from multiple modalities and improved by users, like service engineers, using a feedback loop. Finally, CLEAR will develop advanced techniques for time-series data alignment with AI systems, ensuring more accurate predictions and decisions in time-critical industrial environments.



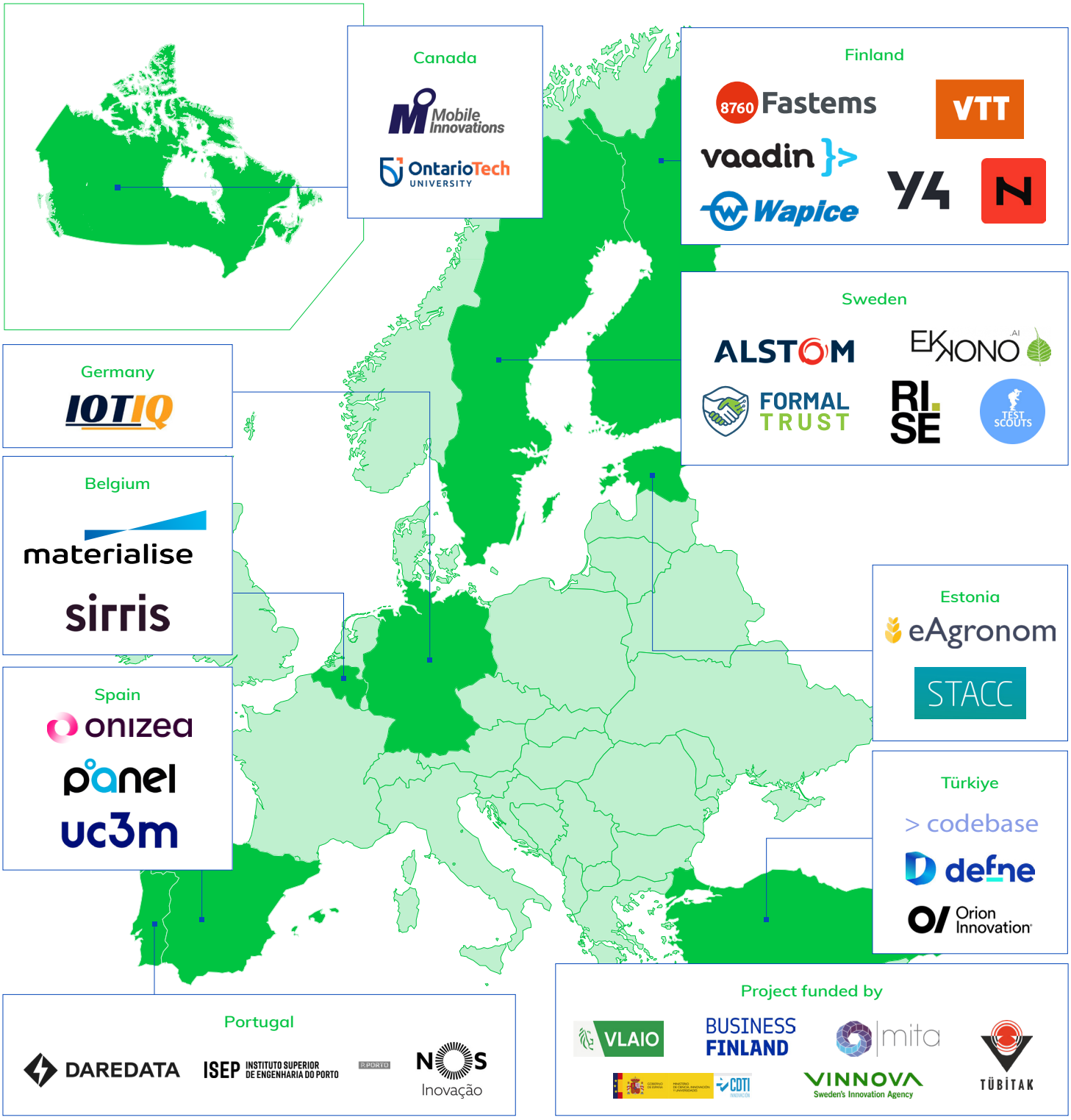
CLEAR multi-modal pipelines for industrial applications.

Projected results and impact

As AI becomes increasingly integrated into mission-critical applications, businesses are urgently seeking solutions that enhance reliability, particularly in industries where inaccurate predictions can lead to safety risks, financial losses, or regulatory non-compliance. CLEAR aims to prevent these very issues: by advancing the field of industrial AI, the project expects to increase cross-modal representation consistency – ensuring stable feature alignment across diverse data types without excessive retraining – and reduce the context error rate through LLM-integrated multimodal interpretation. From a commercial perspective, AI solutions will be deployed that facilitate rapid, reliable decision-making and support Europe's position in digital manufacturing and Industry 4.0; in doing so CLEAR intends to reduce time to market by 10-20%, labour costs by 20-50% and mean time to resolve failures by 10-25%, to name just a few examples. Finally, by adapting and fine-tuning existing LLMs and pre-trained models, the results will have significantly reduced energy demands and data needs when compared to pre-trained or retrained large models. All in all, this will allow CLEAR to enhance business efficiency while ensuring compliance with regulatory frameworks, giving Europe a competitive edge in the global AI market.

Project partners

CLEAR
24026



Project start
November 2025

Project end
December 2029

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