

IDENER is an established R&D centre comprising approximately 120 professionals, of whom around 100 are dedicated research personnel. The organisation combines strong scientific expertise with advanced software engineering capacity, enabling the development, validation and deployment of AI-driven solutions in complex research and industrial environments.

We are currently involved in more than 70 ongoing EU-funded projects, coordinating over 35 of them, with a strong focus on artificial intelligence, explainable AI, computer vision, digital twins and advanced data-driven modelling, with increasing focus on trustworthy and human-aligned AI systems.

Core Technical Capabilities

Artificial Intelligence & Machine Learning

- Advanced data infrastructure design and development, covering ingestion, processing, storage, orchestration and management of heterogeneous sources and data types.
- Expertise in developing AI models for perception and decision-making
- Data-driven analysis.
 - Predictive modelling, forecasting and time-series anomaly detection.
 - Data analysis and pattern extraction from multimodal data.
 - Computer vision and image-based analytics.
- Explainable AI, mechanistic interpretability and counterfactual reasoning.
- Strong background in Generative and Discriminative AI to create synthetic data for training and validation.
- Agentic AI and multi-agent frameworks.
- Digital twins and advanced modelling, including mechanistic and virtual human twins.
- Application of MLOps methodologies to build scalable, reproducible pipelines for continuous monitoring and adaptation.
- Federated learning frameworks for privacy-preserving collaboration.
- AI powered Decision Support Systems.

Representative projects include AURORAI, CLIMAIR, CREDIT or DR-RISE.

Language Technologies & Large Language Models (LLM) Engineering

- Natural Language Processing across multiple domains.
- LLMs fine-tuning, reinforcement learning and alignment with human needs.
- Retrieval-Augmented Generation (RAG) architectures.

Representative projects include HIVEMIND, AI4SWENG and NAVI.

Software Engineering & Systems Integration

- General software development and integration.
- Microservices-based architectures.
- Design and development of hybrid and cloud-based data platforms.

Relevant projects

- **AURORAI** develops a unified platform of explainable, ethical, and fast-learning AI tools that address the key barriers to pandemic resilience: fragmented data, limited forecasting capabilities, weak early-warning systems, and complex decision-making under uncertainty. Our role here is in the research and development of AI agents, explainable AI, counterfactual reasoning and Decision Support Systems.
- **AI4HOPE** (Innovative tools and Artificial Intelligence for Dementia patients) aims to promote the integration of Digital health interventions for pain management, care planning, education, information-sharing, and decision support to improve the quality of life of patients with dementia.
- **CLIMAIR** aims to enhance understanding of the relationships among climate change, air pollution, and non-communicable respiratory diseases using advanced Artificial Intelligence tools. Our roles here are mainly focused on federated learning and AI development.
- **MED1stMR** develops an innovative mixed reality training technology that combines real-world medical simulators with virtual environments to train medical first responders for challenges such as evaluating the situation and monitoring the vital signs of a large number of victims. Our main role here is developing the data platform.