

ITEA Call 2022 projects

Unveiling strong
international projects with
focus on AI

ITEA Call 2022, the second ITEA 4 Call, has generated very interesting and high-quality proposals. 20 of them were labelled by the ITEA Board in March 2023, representing an effort of more than 2,740 person-years and involving partners from 23 countries. As usual, we see a good balance between SMEs that have the agility to innovate (representing almost half of the effort), large industries that can quickly bring the outcomes of the projects to the market and research centres that provide beyond State-of-the-Art research.

It is worth noting the international reach of this Call. New European countries now support ITEA's Call, including the United Kingdom – involved in five projects – and Switzerland. We also see the participation of companies from the United States and Australia, which are interested in being part of the ITEA research programme even if they will most probably be self-funded. The main countries for this Call remain Belgium, Canada, Germany, Finland, Portugal, South Korea, Spain, Sweden, the Netherlands and Türkiye. Beyond their international dimension, the projects have well-defined objectives, high market ambitions and relevant consortia for the technical challenges and the exploitation phase.

Regarding the topics of the projects, Safety and Security is the most represented ITEA smart challenge with five projects. These projects explore different facets of this challenge, covering physical infrastructure security, fire safety, disaster prevention, connected infrastructure security and protection against cyber security fraud. Smart health is also a well-represented ITEA challenge with four projects. Three of them were discussed during last year's ITEA customer workshop dedicated to Smart health. Smart engineering is again a strong topic with four projects that aim to complete the ongoing effort of ITEA to help the design and operation of complex systems. There are three projects related to smart industry that address different industrial sectors from manufacturing to agriculture. The less represented challenges are Smart energy (two projects), Smart mobility and Smart communities (each with one project). No proposal has been submitted for the Smart cities challenge and we hope that this year's customer workshop focusing on this challenge will create new momentum.

The technology focus of the projects continues to be Artificial Intelligence (AI). Different areas of AI will be researched, such as the development of digital twins, the use of domain knowledge represented with ontologies, the exploitation of natural language recognition and the ability to explain AI system outputs. As is often the case, most of the projects have defined use cases that will help to focus the research and to prepare fast exploitation.

In summary, the ITEA 2022 Call is composed of very strong, international and AI-driven projects. We wish all of them good luck for the national applications and hope to see them kick off soon.

ARTWORK

22019

SmART and connected WORKer

Project leader: Daimler Buses - EvoBus GmbH (Germany)

ARTWORK is developing a real-time assistance system for workers in plants who still work with their hands to build customised products like trucks and machines. The solution will comprise digital twins of factory workers and equipment, smart instruction generation and a worker feedback system. The goal is to connect workers to the production line and enable automatic derivation of process instructions based on the context, allowing workers to build customised products more efficiently. The use of and contribution to standards will furthermore allow widespread deployment of the technologies and tools.

BE Faster

22046

Building Energy Flexibility at Scale for Trading and Earning of Revenues

Project leader: Consortio Limited (United Kingdom)

BE Faster brings countries closer to net zero by creating a scalable flexibility trading platform enabling a smarter use of data and controls to reduce energy wastage and support grid supply-demand balancing. The solution defines the net-zero pathway for organisations by looking at carbon grid intensity as a signal for trading. BE Faster provides novel algorithms for trading based on several parameters identified using digital twins. The ecosystem will be accessible using open-source code and templates and standards developed will be used to roll out the solution to partner countries.

CAPE

22017

Cognitively Smart Assistant in Phygital Environment

Project leader: Inosens (Türkiye)

The retail sector plays a crucial role in a country's economy but needs to undergo a transformation in order to be able to provide a seamless shopping experience, combining online and offline activities, that includes personal recommendations and the continuation of purchases initiated in one channel to the other. CAPE addresses these challenges by using various technologies, such as AI, deep learning, blockchain and IoT, to develop personal experiences, improve the performance of robots/kiosks and offer alternative opportunities and technologies not widely available in today's market. The targeted impact includes improved customer and employee satisfaction, increased sales and more efficient store operations.

CODEFILE

22012

Cross-Organisational Data Enrichment for Financial Institutions and Law Enforcement

Project leader: TNO (the Netherlands)

CODEFILE aims to enable the usage of sensitive data in such a way that no information leakage occurs by developing tools to support joint data analysis between financial institutions and law enforcement agencies. This will enable the detection of suspicious activities without compromising privacy or violating regulations. CODEFILE will deliver solutions that improve the anti-money laundering detection success rate with less effort and will additionally create a network where information can be shared securely.

FERIDE

22016

FERtigation Irrigation DEcision Support System

Project leader: ARD GROUP (Türkiye)

Increasing food demand and decreasing water resources have created an urge to find new technologies for the efficient use of water and fertiliser for agriculture. FERIDE aims to provide a technologically controlled farming environment to improve the availability and absorption of water and nutrients in the soil, resulting in a substantial increase in crop production and quality while decreasing farming costs. They will develop a European-scale network of actors to better manage logistics and implement an information system platform, allowing communication between different system actors such as farmers, fertiliser suppliers and irrigation providers.

FireBIM

22003

Accounting for fire safety engineering using Building Information Modelling

Project leader: RISE - Research institutes of Sweden (Sweden)

European national building regulations on fire safety are different from country to country, making international collaboration demanding, costly and risk-prone. FireBIM aims to harmonise and implement the fire codes of its participating countries in an open-source, web-based BIM platform for fire safety assessment that facilitates (inter)national fire safety documentation and compliance from the early design stages. This will enable collective interpretation of fire regulations and automated compliance checking of buildings against fire safety regulations. As a result, design teams will be digitally assisted to create safer and better buildings cost-effectively.

I2DT

22025

Intelligent Interoperable Digital Twins

Project leader: RISE - Research institutes of Sweden (Sweden)

The I2DT project aims to create an interoperability framework, methodology and tool support for constructing digital twins that can reflect complex systems with large-scale heterogeneous data and interactions. The project will address core technologies and application domains of interoperable digital twins and apply them to relevant areas like industrial production, smart cities, infrastructure asset management, wildfire protection and renewable energy resources. The project will also advance model-based development, integrate machine learning components, define a unified reference architecture and provide tool support for both engineering and operating digital twins.

MAST

22035

Managing Sustainability Tradeoffs

Project leader: University of Groningen (the Netherlands)

Software-intensive systems are required to be more and more sustainable in regard to the ease of making changes to the code and to the power consumption and its associated carbon emissions. Often, these aspects conflict with each other. By developing tools and methods, MAST will deal with the complex trade-offs between these two aspects of sustainability, aiming to guide development teams in optimising their design decisions according to stakeholder concerns and system/environment constraints. Organisations will benefit from the MAST results by reducing carbon footprints and technical debt, complying with sustainability regulations and being more competitive by increasing product quality and creating new business models.

MediSpeech 22032

Automated medical reporting-improved clinical efficiency to enhance the patient experience

Project leader: KnowL Solutions B.V. (the Netherlands)

Nowadays, administrative tasks can consume up to 30% of clinicians' working hours, diverting attention from patient care and contributing to physician burnout. The MediSpeech project aims to reduce administrative waste in healthcare by creating an open digital healthcare ecosystem for automated medical reporting. The proposed solution uses AI-powered speech recognition, data interoperability and harmonisation, and technology-advanced clinical decision support to transform the healthcare model into a patient/doctor-centred approach.

NADIR 22014

Natural Disaster Risk and Assessment Platform

Project leader: EarthDaily Analytics (Canada)

Climate change has a significant impact on our biosphere and is affecting people's lives, properties and health while hastening biodiversity loss through wildfires, flash floods and mega-drought events. NADIR aims to build a natural hazard/disaster risk and assessment platform to provide advanced risk assessment products and critical intelligence information to support the mitigation and management of natural hazards/disasters using (new) satellite imaging. This type of data, together with the known ground truth, will allow the extraction of significantly improved intelligence information, enabling better monitoring, management (simulation and operational planning), prediction and, in some cases, prevention of the large-scale impact of natural disasters, thereby reducing damage and saving lives.

OpenSCALING 22013

Open standards for SCALable virtual engineerING and operation

Project leader: Robert Bosch GmbH (Germany)

The European Climate Law sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030 and for Europe's economy and society to become climate-neutral by 2050. OpenSCALING extends open standards and established modelling and simulation tools to support large-scale systems and distributed controllers deployed in the edge-cloud continuum in order to reduce energy consumption and greenhouse gas emissions. Several industrial demonstrators will showcase how the OpenSCALING innovations and benefits can be applied in the energy, building, aviation and automotive domains through green hydrogen production, more efficient heat pumps, fuel cell propulsion and electrified vehicles.

Optimal-LOADS 22004

Optimal Logistics Operation & Analysis Data Space

Project leader: Materna Information & Communications SE (Germany)

Recent crises have demonstrated the importance of ensuring the resilience of the supply chain and its logistics processes and have reinforced the need for the logistics industry to permanently enhance these processes. Optimal-LOADS plans to optimise and digitise logistics and aims to create trust among data providers and users by developing data spaces in various sectors, ensuring data sovereignty and enabling interoperability in multi-stakeholder environments. This will contribute to improved efficiency of the multi-modal logistics supply and transport chains and the valorisation of data in the logistics sector.

PROFIT

22021

PRocedure Optimisation and data-driven eEfficiency Improvement in healthcare environmenTs

Project leader: Philips Medical Systems Nederland B.V. (the Netherlands)

Hospitals are facing acute staff shortages and the prevalence of chronic diseases will only continue to increase. The PROFIT consortium plans to simplify healthcare tasks and enhance patient outcomes with novel solutions that optimise and streamline workflows in hospitals. The key targeted technical innovations are real-time tracking systems based on sensors and video data, a context-aware communication tool for nurses to handle alerts and tasks and AI-based software for the automatic interpretation of clinical images. Clinical experts will ensure user needs are met and use cases will demonstrate the clinical practice of the solutions.

RCFPEP

22010

Real-time Carbon Foot-Print at Product, Equipment, Plantwide

Project leader: LeanCost International Pte Ltd (Singapore)

The production and transportation of goods are two major contributors of greenhouse gases (GHG). For green production to move ahead, there is a basic need for unified, comparable and easy-to-use emissions data. RCFPEP aims to create a tamper-proof, real-time digitalised product carbon footprint measurement tool, covering the manufacturing processes, its first-tier suppliers' freight transportation of inbound raw materials and the transportation of outbound finished goods to customers. The developments will also reflect on ongoing improvement efforts in the circular economy and lower GHG emissions. RCFPEP will provide a digital contribution to help businesses make more sustainable decisions.

Sa4CPS

22007

Secure situational awareness for critical cyber-physical systems

Project leader: VTT Technical Research Centre of Finland (Finland)

Sa4CPS aims to develop a secure situation awareness concept for critical cyber-physical systems in the logistics, mobility, energy and security sectors, particularly in ports. The targeted innovation will arise from the application of novel solutions for situational awareness with a digital zero-trust approach with distributed ledger technologies (DLT). The aim is to enable situation-aware IoT, operating in a smart way with AI, and DLT for enabling shared digital trust for multiple stakeholders. The Sa4CPS concept is expected to improve the resiliency, security, privacy and safety of people, autonomous physical objects and company digital twins during unexpected events such as accidents and physical or virtual attacks.

SAFETE

22018

Swift Access for Emergency Triage/Treatment e-strategy

Project leader: ARD GROUP (Türkiye)

Health emergencies can happen unexpectedly to anyone at any time. If after-hours primary care services are not available or are difficult to access, patients will visit the emergency department (ED) to seek help, which results in ED congestion. The SAFETE project aims to develop digital health systems to transform after-hours urgent primary care service delivery by offering the right care at the right time. The system includes virtual care, sensing using patients' own cameras and wearables, data intelligence, and clinical intelligence. It will have a positive impact on health system operations, patients and health professionals and will optimise costs at the same time.

SINTRA

22006

Security of Critical Infrastructure by Multi-Modal Dynamic Sensing and AI

Project leader: TAV Technologies (Türkiye)

Stakeholders of critical industrial and civil infrastructure, e.g. airports, power plants and road networks, frequently suffer from disruptions caused by an overwhelming diversity of man-made physical safety and security threats, ranging from well-organised criminal activities to low-level but costly actions like vandalism. SINTRA aims to improve the resilience and protection of these critical infrastructures by developing an open data-streaming AI platform that enables interoperability, information sharing and privacy protection. Using multi-modal sensing and AI-powered data analysis, it will provide a comprehensive view of the infrastructure's safety and security and detect complex anomalies.

SOSIS

22029

Software product line Optimisation for Safety-/mission-critical Industrial Systems

Project leader: Alstom Transportation (Sweden)

A major challenge for all companies working with software product lines (SPL) is to handle the variability aspects of the SPL over their complete lifecycles, especially in safety-critical and mission-critical systems. The objective of SOSIS is to develop methods and solutions to improve the management of variability and reduce certification efforts. SOSIS's approach is holistic, looking into methods and techniques related to model-based development for requirement engineering, variant development and variant management while investigating model-based and AI/ML-based techniques for variant testing and deployment phases and providing a platform for experimentation and knowledge transfer for European industry.

SmartEM

22009

Open reference architecture for engineering model spaces

Project leader: Fraunhofer SCAI (Germany)

SmartEM aims to address the limitations of current engineering models by developing a reference architecture for engineering model spaces. The architecture will enable the reuse, exchange and integration of computational engineering models, reducing the need for costly design corrections and promoting early data and model exchanges. SmartEM will use AI-assisted methods to create surrogate models from heterogeneous data sources and allow their re-combination within a given engineering domain. The project will develop use-case model spaces to manage reusable and transferable engineering models for various domains and provide solutions for IP management to enable model exploitation in an increasingly digital engineering market.

TREAT

22022

Transforming Healthcare Through Semantic Interoperability & Patient Self-Efficacy

Project leader: My Viva Inc. (Canada)

TREAT aims to increase patient self-efficacy in managing non-communicable diseases, including heart attacks, cancers and chronic respiratory diseases, by using an asynchronous model and integrating data from wearables, journals and medical records. In such a model, healthcare access moves from the clinic (system-centric) to the patient's daily life and health management shifts from the clinician to the patient. The project will develop software-based solutions, like semantic interoperability, automated care feedback loops with AI recommendations and novel interfaces using interactive augmented reality, to improve patient self-efficacy.