

Introducing the ITEA 3 Call 6 projects

A Community in motion

By ITEA Vice-chairman Philippe Letellier

20 projects, 19 countries and 2708 Person Years make up the sixth ITEA 3 Call.

Year after year, we see the interest of industry in our straightforward process for taking innovation straight to the market – something that the positive figures for this year prove. Once again, SMEs play a crucial role in the ITEA Community, with more than 1314 Person Years (PY) in total. The presence of large industrials is also vital to ITEA’s ongoing success, having provided 710 PY as well as opportunities to increase the impact of the SMEs in terms of global reach and scaling up for the market. The large companies that manage the ITEA Programme, the ITEA Founding Companies (IFCs), also have reasons to be cheered: despite having less than 267 PY between them, their management of the Programme is what allows ITEA to maintain its unique approach to industry and business.

At ITEA, we are proud of our welcoming nature and the Community openness to fresh faces. 53.2% of Call 6 partners are new to ITEA and 20% of project leader companies have never before been in this position. In other words, ITEA is always in motion. Another key indicator is human capital: 70% of ITEA project leaders are performing this task for the first time, yet they consistently bring the international, high-tech and market-oriented skills that we need to maintain a high profile and keep our industrial partners at the global forefront.

This year, we observed a very important focus on Smart engineering with 10 proposals which again cover simulation (for which ITEA has already been so successful) and new methodologies to cover different point of views for software and system engineering. With four projects, Smart health and Safety & Security are the two other topics on the podium. It is interesting to see that the Smart health projects are all dedicated to data monitoring - clearly the new frontier of today. Nevertheless, I bet

that we will see some more traditional projects on devices (image as treatment) in the next years because we must continue to progress there and have already been so successful in this direction. Smart industry and Smart mobility remain low, with only one project per domain. I also forecast that these will be back in the coming years, as these domains are very important for our future and the digital transition still requires a lot of work. We’ve observed a certain focus on Smart energy for the methodology of deployment or security, which was hidden behind other Challenges but deserves to appear as a domain itself. A last global remark is that AI is everywhere in ITEA: it is the required tool in all domains and the ITEA Community clearly masters it in a good way when we look at the maturity of the proposals. The global quality of the proposals was good, with a unique number of top-ranked proposals.

In the end two projects were cancelled after labelling due to lack of funding in (one of) the main countries.

ITEA 3 CALL 6 PROJECT OVERVIEW

Challenge	Projects
Smart engineering	AIDOS, AIToC, COMPAS, DEFAINE, e-INDEX, Muwo, Phoenix, UPSIM, VMAP analytics
Smart health	D4Health, INNO4HEALTH, HARMONY, LifeStylePre
Safety and Security	ACASIA, EnGRC, Orchestrator, STACK
Smart industry	MIRAI

Hereafter, you will find a short project description of each labelled project.

ACASIA - 19048

AI-supported Compositional Analysis and Synthesis for Intelligent Embedded Applications

Project leader: Siemens AG (Germany)

New services and solutions for future mobility and industry introduce a new level of complexity for intelligent embedded software systems. ACASIA introduces a mix of AI-based methods and classic methods to allow an optimal compositional verification approach for verification support for critical, parallel embedded software in the area of AI containing software systems. It allows individual software components to be analysed separately and then uses these results to construct an overall system that is verified, safe and secure.

AIDOS – 19030

Systematic Development of AI-based Industrial Domain Solutions

Project leader: Demag Cranes & Components GmbH (Germany)

The AIDOS project aims to enable personnel with fewer skills in the application of data analytics, machine learning and similar AI techniques – as well as personnel with deep knowledge – to find the right technology for dedicated, domain-specific tasks that could take advantage of AI technologies. Besides guiding them to the right solutions, the AIDOS AI Knowledge Portal will direct the problem owner to high-rated companies and researchers in order to solve the problem described.

AIToC – 19027

Artificial Intelligence supported Tool Chain in Manufacturing Engineering

Project leader: Volvo Group Trucks Operations (Sweden)

The goal of AITOC is to develop an integrated toolchain for manufacturing engineering that supports decision-making in early phases. To achieve this, the toolchain will support the formalisation and automated analysis of requirements, the computer-aided generation of process plans, simulation models and instructions and the software-supported generation of layouts. In all of these dimensions, Artificial Intelligence will be utilised in expert systems and simulations based on data from existing solutions. The interoperability of engineering tools is also in focus and will be developed using standardised neutral data formats.

COMPAS – 19037

Compact modelling of high-tech systems for health management and optimization along the supply chain

Project leader: NXP Semiconductors (Netherlands)

High-tech systems integrate numerous highly complex components. Simulations are necessary at various stages of their design process to ensure mechanical robustness and reliability. COMPAS aims to develop novel, compact models and ultra-compact digital twins. The compact models capture nonlinear, transient and coupled (i.e. multi-physics) situations. The digital twins can self-sufficiently cast decisions (ultimately in real time) for prognostic health management. COMPAS will develop them using the example of the thermo-mechanical reliability of high-tech systems, such as motor control units for automated factories, smart infrastructures (streetlights, power grids) or autonomous vehicles.

D4Health – 19041

Data-driven decision-making for distributed healthcare

Project leader: TNO (Netherlands)

The D4Health project will tackle situations in which decision-makers are confronted with complex strategic decisions in the healthcare infrastructure domain. The project aims to gather and bring together datasets that represent the underlying mechanics (demographics, epidemiology, healthcare productivity figures, real estate capacity, ...) and make them interoperable as linked data. Using this data and knowledge rules that are elicited from domain experts, a dashboard can be created that enables decision-makers at various levels to study scenarios.

DEFAINE – 19009

Design Exploration Framework based on AI for front-loaded Engineering

Project leader: ParaPy BV (Netherlands)

European players are being forced to explore new product development approaches that can drastically reduce lead times. DEFAINE will deliver a Design Exploration Framework to reduce recurring costs in the design of aircraft and wind energy systems and the lead times for design updates. The framework will enable the effective exploitation of the front-loaded product development approach in combination with Artificial Intelligence. Front-loading can significantly reduce the inefficiencies of the current engineering approach by enabling large-scale design exploration at the beginning or even before the start of a project.

e-INDEX - 19020

Electricity Intelligent Demand-Side- and Energy-Management Exchange

Project leader: RISE Research Institutes of Sweden (Sweden)

Demand-Side Management (DSM) enables the adjustment of loads in the grid to ensure a balanced operation while simultaneously optimising the utilisation of resources in the electrical power system. Today's DSM systems are limited to local energy grids and the load-balancing solutions within the local grid itself. A larger roll-out of the same idea can be achieved by utilising mathematical planning and machine learning methods. e-INDEX proposes a more holistic level of data integration and decision-making spanning a large-scale, inter-regional connection.

EnGRC – 19044

Development of Cyber Security Maturity Model and GRC Platform for Energy Sector

Project leader: Karya Bili im Ltd. ti (Turkey)

Cybersecurity in the energy sector is a big challenge for countries and organisations. The goal of the EnGRC project is to (1) define a relevant cybersecurity maturity framework, (2) develop a Governance, Risk and Compliance (GRC) platform to apply the defined framework with the contribution of all stakeholders and (3) process IT and OT data from stakeholders and provide cybersecurity benchmark information to energy sector authorities on a utilisable business intelligence platform.

HARMONY – 19019

Harmonizing IT-eco-systems providing a seamless workflow while integrating multi-vendor applications

Project leader: Philips (Netherlands)

HARMONY will create a harmonised IT ecosystem, providing healthcare professionals with real-time, comprehensive insights into patients' statuses while integrating all relevant information for diagnosis, treatment selection and follow-up. The project's main innovation is the ability to compose disease-centric workflows through the vendor-agnostic, seamless integration and interoperability of all relevant applications along the care path. This can be considered a revolution as the care professional (e.g. doctor) can use a single, easy-to-use IT system when performing his/her work.

INNO4HEALTH – 19008

Stimulate continuous monitoring in personal and physical health

Project leader: Philips Electronics Nederland BV (Netherlands)

Incorporating Remote Patient Monitoring (RPM) in chronic disease management can significantly improve an individual's quality of life. INNO4HEALTH aims to stimulate innovation in continuous health and fitness monitoring in order to inform patients and their physicians on their readiness regarding surgery and the ability to recover rapidly from invasive treatment. In sports, the same technology will be used to continuously assess fitness and health in order to provide information to athletes and their coaches and to help them optimise their performance during competitions.

LifeStylePre – 19023

AI-Enabled Solutions for LifeStyle and Health Interventions

Project leader: University of Oulu (Finland)

The WHO reports that non-communicable diseases (e.g. cardiovascular diseases, cancer, chronic respiratory diseases and diabetes) cause 71% of all deaths globally. Up to 40% of NCD deaths could be prevented, so there is a clear need for individual-centric, technology-based and evidence-based approaches to early detection and structured care. LifeStylePre combines insights from preventive health settings and clinical research. The resulting solutions will be designed to enable personalised lifestyle advice and compliance monitoring for at-risk subjects with the aim of preventing or delaying the onset of irreversible disease burdens.

MIRAI – 19034

Machine Intelligence for smart/sustainable planning/operation of IoT/Edge computing applications

Project leader: NOS Inovação (Portugal)

The standard approach of IoT applications when leveraging cloud infrastructure to address constraints at the level of end and edge nodes is no longer viable, especially for applications with hard real-time requirements and increasing AI usage. This project will develop MIRAI Framework Building Blocks (MFBB) based on AI techniques in order to enable the smart and sustainable planning and operation of IoT and edge computing applications. This will supplement the traditional vertical scaling approach to the cloud with the horizontal scaling of IoT and edge computing applications amongst edge devices.

Muwo – 19022

Multi-method workspace for highly scalable production lines

Project leader: Ruhr-Universität Bochum (Germany)

Muwo aims to create an opportunity to use production systems more effectively through flexible scaling. Scalability is achieved by the development of smart hardware interfaces. This will allow workstations to advance to multi-method workstations that support both manual and automated processes. Additionally, workstations can combine different processes. A transmutable simulation validates the workstation configuration and a process combiner optimises the production configuration using AI/ML methods. Through this, Muwo improves the design and operation of production systems.

Phoenix - 19024*Continuous Evolution for Future-Ready Software Systems***Project leader: ERSTE Software Limited (Turkey)**

The current speed of change and the advent of completely new challenges like AI impose difficulties for organisations everywhere in keeping up. At the same time, most of the effort is actually required to restructure existing systems as a basis for the future. Phoenix is going to change this by providing novel capabilities to support the evolution of software in unprecedented ways, enabled by current advances in AI in particular. Phoenix will support system understanding and analysis, situation assessment and decision-making and the (semi-)automated transformation of the system to support enhancement.

UPSIM – 19006*Unleash Potentials in Simulation***Project leader: Virtual Vehicle Research GmbH (Germany)**

Nowadays, simulation is used for design space exploration, virtual testing or predictive maintenance for supporting early stage product decisions. Most importantly, real testing is ultimately used to assure product quality and certification. The aim of UPSIM is to enable companies to safely collaborate on simulations in a repeatable, reliable and robust manner and to implement simulations in a Credible Digital Twin setting as a strategic capability in order for them to become an important factor in quality, cost, time-to-market and overall competitiveness.

Orchestrator – 19039*Artificial Intelligence Based Network Operation Center Orchestration***Project leader: Cekino Savunma Elektronik ve Bilisim A.S. (Turkey)**

Orchestrator aims to develop an AI- and ML-supported network monitoring, management and cybersecurity platform. The main focus is on the monitoring and management of highly dynamic, large-scale hybrid networks, as well as ensuring the cybersecurity of such networks by employing AI- and ML-based solutions for acting against emergent attacks at machine speed. The Orchestrator platform will revolutionise the experience for security analysts by providing proactive capabilities via automated remediation actions against cyberattacks based either on Robotic Response or Cognitive Response.

STACK – 19045*Smart, Attack-Resistant Internet of Things Networks***Project leader: RISE (Sweden)**

The goal of STACK is to let IoT networks maintain their functionality in both benign environments and more challenging situations, such as when IoT networks are under attack or exposed to harsh radio environments and cross-technology interference. Solving these challenges will enable a new class of IoT applications that provide a certain Quality of Service (QoS), even when under attack. Our major innovations towards this goal include more robust IoT communication, attack detection and mitigation by performance and interference monitoring and smart algorithms that leverage a tight integration of IoT devices with a smart edge.

VMAP analytics – 19007*Smart Analytics for Multi-Scale Material and Manufacturing Modelling***Project leader: Fraunhofer SCAI (Germany)**

Many companies have already introduced Digital Twins. However, if producers of advanced materials and complex parts need a more detailed look into the ongoing manufacturing processes and changing material properties, they will not find solutions today. The vision of VMAP analytics is to enable the realisation of smart Digital Twins for materials and manufacturing design tasks. The VMAP interface standard will open the initial VMAP standard for multi-scale models, sensor and measurement data and information from production machines. VMAP analytics will provide an open ontology for engineering processes in materials and manufacturing design.