

# AI Call 2020 ITEA projects

Diverse and promising innovations  
improving AI



Over the past few years, Artificial Intelligence (AI) technologies have become increasingly important in ITEA projects in order to solve challenges defined by (business) needs. Several successes have already been achieved on creating better care, traffic flow and safety and, in our last two Calls, AI was even present in a majority of project proposals. In addition, the Eureka Clusters CELTIC-NEXT, EUROOGIA, ITEA and PENTA-EURIPIDES<sup>2</sup> perceived a common cross-domain interest in developing, adapting and utilising emerging AI within and across their focus areas. These Clusters, together with a number of Eureka Public Authorities, launched a Call for innovative projects in the AI domain. The aim of this Call was to boost the productivity and competitiveness of European industries through the adoption and use of AI systems and services.

The Eureka Clusters AI Call 2020 attracted a lot of interest: by the deadline of 15 June 2020, over 40 project proposals had been received, of which 35 indicated ITEA as the main Cluster and another had ITEA as a secondary Cluster. As 8 proposals were not eligible, 27+1<sup>1</sup> proposals from 17 different countries were evaluated with a total of 1450 Person Years, resulting in 12+1 labelled AI projects under ITEA.

These projects confirm the pervasive nature of AI methods, which continue to be applied in many new sectors. Within this Call, we see projects that will work on bringing AI methods to fields such as smart electricity grids, photovoltaic power plant management, robotics, agriculture, semi-conductor production and transportation systems. In each of these domains, there is the potential to extract quality data and to build more capable systems with new AI features. We also see more generic projects aimed at developing the next generation of AI systems. The AI field lacks human experts, so it is important to develop a platform that will ease the use of AI methods and contribute to its diffusion. Another important challenge is to efficiently execute AI applications, which are often computing-intensive. New accelerators have been designed to speed up execution and

these must be properly used. The hybridisation of AI methods with other methods, such as Digital Twins, is another promising direction that will be explored by one project. Last but not least, a project will work on the interaction of software engineering and AI. On one hand, the development of AI software calls for the adaptation of software engineering methods and, on the other hand, AI can contribute to more efficient software engineering methods.

Globally, this Call has generated a set of projects that are diverse and very promising for both cutting-edge innovations in some sectors and the improvement of AI methods.

**ITEA AI Call projects overview**

Due to lack of funding in the main countries, projects ESSENCE-AD and SENSAL have recently been cancelled. The remaining labelled AI Call 2020 ITEA projects can be organised across the different challenges as follows:

Challenge	Projects
Smart engineering	AMPLify, ASIMOV, EFICAS, IML4E
Safety and security	AIS <sup>2</sup> afe, IML4E, Spectralligence
Smart health	RoboNimbus, SHERPA, Spectralligence
Smart industry	AISSI, AMPLify
Smart mobility	AIS <sup>2</sup> afe, SHERPA
Smart cities	AIDEMS, Al4PV (ITEA as secondary Cluster)

Table 1: Challenge landscape of the 2020 AI Call. Some projects have multiple challenges.

<sup>1</sup>27 projects with ITEA as the main Cluster and 1 project with ITEA as the secondary Cluster


We invite you to discover the innovative solutions proposed by the projects that were submitted to ITEA:

#### **AIDEMS - 20201**

##### **AI-Enabled Demand Side Management for Energy Sustainability**

*Project leader: RISE - Research Institutes of Sweden, Sweden*

Renewable electricity networks are strained by the increased demand for high-power charging and the volatility of renewable sources. Demand Side Management (DSM) is a framework that addresses this challenge through information sharing, integrated planning and smarter decision-making across the network. However, DSM implementation suffers from data integration, security and standardisation problems. AIDEMS' objective is to power DSM platforms with new data models and machine learning algorithms that balance finding optimal solutions (that account for greater parts of the network) with search tractability.

 Secondary Cluster: EUROGIA


 <https://itea3.org/project/aidems.html>


#### **AIS<sup>2</sup>afe - 20214**

##### **AI for Safety and Security Assurance of Automated Vehicles**

*Project leader: RISE - Research Institutes of Sweden, Sweden*

Companies are currently investing more in IT cyber security and cyber security management than in cyber security software for vehicles. However, regulatory initiatives are driving Europe to become a first mover in these domains. There is a great need to upskill safety engineers, produce (cyber) security talent and improve the knowledge and cooperation between firms as well as safety and security engineers. AIS<sup>2</sup>afe addresses this through innovative measures for integrating the safety and security disciplines by developing AI technology and methodologies and tools targeting AI technology.

 Secondary Cluster: CELTIC-NEXT


 <https://itea3.org/project/ais2afe.html>


#### **AISSI - 20212**

##### **Autonomous Integrated Scheduling for Semiconductor Industry**

*Project leader: Robert Bosch GmbH, Germany*

Digitalisation is driving increased demand for microchips and shortening the product lifecycle and the high variety of customer-specific devices is leading to a growing need for high-mix low-volume (HMLV) semiconductor production. The AISSI project - Autonomous Integrated Scheduling for Semiconductor Industry - proposes sourcing, developing, integrating and applying novel AI-based approaches. By applying reinforcement learning and knowledge graphs in a continual improvement framework for autonomous, integrated production and maintenance scheduling, competition can be outperformed in terms of efficiency, cost effectiveness and quality.

 Secondary Cluster: PENTA-EURIPIDES


 <https://itea3.org/project/aissi.html>

#### **AMplify - 20220**

##### **AI Modelling Platform**

*Project leader: Software AG, Germany*

For many years, industrial system builders have been collecting product and process data in different formats and tools, but the full potential benefits are often neither analysed nor correlated and utilised. There is a widespread imbalance in the supply and demand of qualified AI experts in industry, which challenges today's technological development. The AMplify project will create an AI Knowledge Portal to provide guidance on the application of available AI solutions and platforms and support in finding available experts to make AI tools and algorithms applicable and more end-user friendly.


 <https://itea3.org/project/amplify.html>


#### **ASIMOV - 20216**

##### **AI training using Simulated Instruments for Machine Optimization and Verification**

*Project leader: Thermo Fisher Scientific, the Netherlands*

With the rise of high-tech cyber-physical systems (CPS) in all areas of industry and society, the user-friendliness and up-times of these systems are becoming increasingly important. Keeping the control parameters of CPS in their correct operating window is a particularly large challenge, such as in electron microscopy, unmanned utility vehicles and pulp & paper process control. ASIMOV will increase the autonomy and self-optimisation of CPS by creating physically realistic Digital Twins of these systems and training innovative AI algorithms for CPS control using these Digital Twins.

 Secondary Cluster: PENTA-EURIPIDES


 <https://itea3.org/project/asimov.html>

#### **EFICAS - 20229**

##### **Energy Efficient Heterogeneous AI-Platform for Smart Mobile and Embedded Systems**

*Project leader: Siemens AG, Germany*

Essentially all mobile applications are severely power limited, which blocks huge business cases. Increasing functional complexity in mobile and autonomous applications impacts the computational load by increasing the power demands of embedded platforms. EFICAS introduces a generic and scalable software platform supporting energy-efficient deployment of AI algorithms on the multicore heterogeneous computation technologies. It supports all technology solutions, including localised and distributed computation settings as well as cloud offloading. It addresses resource allocation at runtime and hybrid coherent operation with optimised task allocation at design time.

 <https://itea3.org/project/eficas.html>



**IML4E - 20219****Industrial Machine Learning for Enterprises***Project leader: Fraunhofer FOKUS, Germany*

Smart software solutions including AI and Machine Learning (ML) have shown a great potential to automate processes that were not accessible to automation. Since AI and ML differ from classical software development regarding fundamental activities and processes, it is unclear how AI and ML can be integrated into existing industrial-grade software development processes. Addressing the industrialisation of ML development and operations, the IML4E project will develop the IML4E framework, covering methods, techniques and tools dedicated to delivering and maintaining high-quality smart software in efficient, scalable and manageable processes.

🌐 <https://itea3.org/project/impl4e.html>

**RoboNimbus - 20231****Smart Platform for Robot Management and Coordination with AI powered Cloud***Project leader: BYS GRUP Bilişim Sistemleri Danışmanlık Ticaret ve Sanayi, Turkey*

Robots are transforming automation processes across all industries. As robot technologies improve, robots become increasingly capable and cheaper, incentivising their use in ever more sophisticated processes. To capitalise on this trend, the RoboNimbus project envisions an AI-powered, cloud-based, all-in-one robot management platform that will allow the user to connect, monitor, control and maintain robot fleets with ease. RoboNimbus will leverage state-of-the-art technologies including IoT, Cloud Computing, Virtual Reality, Augmented Reality and Predictive Maintenance to create a truly futuristic robot management platform.

🌐 <https://itea3.org/project/robonimbus.html>

**SHERPA - 20206****Smart Human Centered Automation for Professional Applications***Project leader: Philips Medical Systems Nederland, the Netherlands*

In various professional and safety critical applications, collaboration between the user and the machine is crucial for the correct and safe execution of tasks, such as with medical imaging equipment and vehicles. The user is part of the closed loop of the system, but information overload and complexity often lead to fatigue, stress or confusion, resulting in errors, safety issues or accidents. The SHERPA project will develop AI-based solutions to assist and automate system operation and make complex Human-Machine Interaction in medical and automotive applications more intuitive.

🌐 Secondary Cluster: PENTA-EURIPIDES

🌐 <https://itea3.org/project/sherpa.html>

**Spectralligence - 20209****Spectral Analysis in life sciences and materials sciences through Artificial Intelligence***Project leader: Philips, the Netherlands*

Molecular and Atomic Spectroscopy is a well-established set of technologies that use the electromagnetic spectrum to generate unique fingerprints of molecular structures, with a broad set of applications in chemistry, medicine and environmental and safety services. A significant reduction in dependence on human experts is necessary to bring novel technologies to fruition for ever expanding opportunities. The Spectralligence project aims to demonstrate that cross-domain-validated Neural Networks for spectral analysis (leveraging innovations in micro-electronics and component miniaturisation) can significantly accelerate market growth and technology adoption.

🌐 <https://itea3.org/project/spectralligence.html>

In addition, there was also one project that chose ITEA as a secondary Cluster:

**AI4PV - 20233****Artificial Intelligence for Operation and Maintenance of PV Plants***Project leader: EDP N.E.W. R&D – Centre for New Energy Technologies, Portugal*

The Paris Agreement has defined the targets to limit global warming to 1.5° with a massive contribution by renewable energy. Industry has been working to improve the performance of photovoltaic (PV) systems, but unsolved challenges remain concerning reliability and robustness, hindering lean integration in the electrical system. In this context, the main goals of the AI4PV project are to reduce LCOE and increase the operational performance of PV plants through the hybrid use of physical models, AI and Digital Twins.

🌐 Main Cluster: EUROGIA

🌐 <https://itea3.org/project/ai4pv.html>

**Join the next Eureka Clusters AI Call 2021**

After the successful Joint AI Call 2020, the Eureka Clusters CELTIC-NEXT, EUROGIA, ITEA, PENTA-EURIPIDES and SMART have launched a new AI Call and fourteen countries have allocated budget to support your groundbreaking Artificial Intelligence innovations.

So do you have an innovative AI project idea? Submit your project proposal at latest by 28 June 2021! For more information visit <https://eureka-clusters-ai.eu/>.

