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MAGAZINE

10 new European projects for Fondazione Bruno Kessler's Digital Industry Center

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The involvement of Trentino based businesses, the creation of demonstrator sites, and the development of solutions easily adaptable to the local area are being promoted

Artificial intelligence, digital agriculture, robotics, green transition, climate resilience, mining, cultural heritage. These are the areas in which the **Digital Industry Center** at **Fondazione Bruno Kessler**, directed by **Alessandro Cimatti,** has taken the lead in obtaining funding for 10 new European projects, while promoting the participation of the Trentino region by involving local businesses, creating demonstrator sites and developing solutions that are easily adaptable to the local area.

The projects, **FEROX, VOT3D, SEC4TD, InCUBE, USAGE, TRACENET, 5Dculture, AI-PRISM, AGILEHAND and AgriDataSpace**, are all starting between the summer of 2022 and the beginning of 2023.

"I express my full satisfaction with FBK's success, and in particular with the Center for Digital Industry," **Alessandro Cimatti** said, "and I thank all the people who, in various capacities, have contributed to the achievement of such a significant number of European Projects. This is an important signal of positioning of Fondazione Bruno Kessler and of the DI Center, which, through the development of technologies on topics dear to the EU, such as artificial intelligence, green transition, climate, agriculture and digital transition, promotes the involvement and participation of Trentino based businesses. This is a further demonstration of FBK's mission, which consists in providing concrete impact of our research activity on the Trentino system".

The projects

The **FEROX** project – Fostering and Enabling AI, Data and Robotics Technologies for Supporting Human Workers in Harvesting Wild Food – started in September 2022 and coordinated at European level by FBK, will employ autonomous drones, 3D models and Artificial Intelligence solutions to help berry pickers locate berries and optimize their operations. FEROX will provide harvesters with navigation and tracking services and physical support to improve their working conditions and increase safety in the woods. "FEROX's holistic solution will contribute to overall

worker safety by automatically monitoring pickers and providing help where it is needed," comments Paul Chippendale (FBK), FEROX coordinator. These results will open commercial opportunities for European companies to adapt the developed solutions to farming and foster global sustainability for safer and more profitable fruit harvesting.

The **VOT3D** and SEC4TD projects, started in July 2022, will work to improve safety and reduce energy costs in the mining sector. VOT3D, through accurate and detailed 3D surveys with mobile devices, will seek to improve ventilation in underground tunnels. SEC4TD will develop an integrated solution based on advanced and emerging technologies-such as low-power IoT devices, mathematical terrain models, drones, advanced visualization tools and data analysis techniques-to increase safety and efficiency while reducing the environmental impact of current mining processes.

The **InCUBE** project, started in July 2022 and coordinated by CERTH, plans to support the energy upgrading of buildings through standardized and integrated processes based on 3D surveying (Digital Twins), BIM, modeling, and energy from renewable sources. InCube, in addition to the Digital Industry Center, involves FBK's Sustainable Energy Center and will have the Santa Chiara Open Lab district and the Santa Chiara Cultural Services Center, in Trento's historic center, among the project's demonstrator sites.

The **USAGE** project, started in September 2022, aims to provide solutions and mechanisms to make geographic, environmental and climate data available and usable citywide. USAGE will support the implementation of the various actions of the European Green Deal at the level where climate change is most felt: the city. USAGE will provide Artificial Intelligence-based tools and innovative geographic data analytics to share, access and use city-level data from Earth observation (EO), Internet of Things (IoT) or crowd-sourced, leveraging standards for data and interoperability of services.

The **TRACENET** project, starting at the end of 2022, aims to develop Cloud solutions to enable Civil Defense workers to see and analyze emergency scenarios, interacting with others online and planning interventions virtually. These solutions will reduce staff training costs and offer different virtual scenarios where rescue crews can train and practice their operations. TRACENET is coordinated by the Autonomous Province of Trento with FBK-3DOM as the only technology partner for the development of solutions.

The **5Dculture** project, starting at the end of 2022, plans to increase the supply of digital twins in the European cultural heritage sector and foster their reuse in important sectors such as education, tourism, fashion, and the broader cultural and creative sectors, toward social and economic sustainability. The project will also implement a number of digital technologies and tools, based on semantic AI technologies. The consortium is composed of highly qualified organizations aware of the principles and strategy of the new Data Space for Cultural Heritage, with complementary expertise covering the entire value chain, capable of successfully achieving the project goals.

AI-PRISM is a project that will start next October with the goal of developing an ecosystem of solutions, based on artificial intelligence and centered on people, aimed at production scenarios where it is difficult to introduce 'automation and where speed and flexibility are essential. The result will be an integrated and scalable ecosystem with specific solutions for installing semi-automated and collaborative manufacturing processes in flexible manufacturing processes, for which no specific robotic programming skills will be required. To enable performance assesment,

transferability, scalability, and large-scale implementation of these solutions, four demonstration prototypes will be built in real operating environments in key manufacturing sectors: furniture, food and beverage, built-in appliances, and electronics, as well as a general demonstration facility. The project aims not only for improvements in specific areas, but to use technological innovation to support a paradigm shift in which AI, robotics, and social and human sciences, integrated into the manufacturing sector become a concrete contributor to the improvement of flexible manufacturing processes. To achieve this goal, the project relies on a strong consortium of 25 partners from 12 countries, bringing together all players in the Human Robot Collaboration (HRC) value chain.

The recently acquired **AGILEHAND** project, which will start in early 2023, will join the market for conveyor systems and, in particular, the segment of robots for automated material handling. In the real world, many objects to be handled, including food, clothes, bottles or plastic objects, are soft or deformable, and robots are not yet efficient and effective in handling these objects. The AGILEHAND project aims to develop AI-based technologies for autonomous classification, handling, and packaging of soft and deformable products as a strategic tool to improve the flexibility, agility, and reconfigurability of production and logistics systems of European manufacturing companies. Developed solutions will be demonstrated in four industrial pilot projects that differ in the surface characteristics, deformability and consistency of the products to be handled. The consortium includes two Trentino based enterprises: Cooperativa Agricola Sant'Orsola, an organization of producers specializing in the farming of small fruits, strawberries and cherries that will support the testing and validation phases within the project, and B2A S.r.l., a company that operates in the mechatronics sector and whose production focuses on fruit processing, treatment and selection lines.

The **AgriDataSpace**, starting in the fall, is a project funded under the Digital Europe work program that aims to create a European framework for managing a shared, secure and sovereign data space for agriculture. Agriculture is at the crossroads of European priorities, and to achieve the lofty goals set in the Farm to Fork strategy of the European Green Deal, the sector must embrace digital technologies to maintain a competitive position in the market. Huge amounts of data from multiple sources in the agribusiness sector and generated in the context of policy implementation have the potential to create additional services for farmers, assisting them in their decision-making processes and helping them to compare with their competitors. In addition, there are more potential, but as yet unknown, in the benefits of agricultural data exchange among different ecosystem actors applying data technologies at a larger scale to improve both financial and environmental performance in multiple domains. In support of this, and building on the progress already made at the European level in initiatives such as GAIA-X and IDSA, AgriDataSpace will coordinate a preparatory action to pave the way for the European Data Space for Agriculture that facilitates secure, reliable, transparent, and accountable data exchange, processing, and analysis to create new opportunities for monitoring and optimizing natural resource use by stimulating data-driven innovations.

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