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EFRA (Extreme Food Risk Analytics)

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A new EU project to transform food risk prediction with AI-powered analytics.

According to European Food Safety Authority, in 2021, 4,005 foodborne outbreaks occurred in the EU (a 29,8% increase compared to 2020), while the European Region World Health Organisation estimates that every year more than 23 million people fall ill from eating contaminated food, resulting in 5,000 deaths and more than 400,000 disability-adjusted life years. Food recalls cause great economic and legal burdens to companies as well as a major wound to their reputation.

All of the above are characterized by a common denominator – time. Both citizens and companies are suffering from the foodborne disease consequences after food contamination has occurred-when it is too late. But this is a one-way street, isn't it?

Before they happen: EFRA to take advantage of extreme data management technologies with a ground-breaking potential for forecasting, identifying and preventing emerging food risks.

Well, the consortium of partners for the EFRA project has a different opinion. EFRA's initiative is to beat time by utilizing new frontiers in data-driven decision-making. For the initiation of this ambitious project, a kick-off meeting took place in early February in Athens and had the project off to a great start. This European Union's co-funded project will showcase a high-tech paradigm shift with a tremendous potential impact on ensuring safer and more sustainable food in a global environment that is under enormous pressure. All 9 partners - coming from 7 different European countries- have been brought together, ready to unite their expertise and efforts for the next 3 years.

Picture from the Kick-off meeting, in Athens, GR, 2-3 Feb 2023. In the picture: Representatives from all the partners.

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Before they happen

Through digitization and developments in sensor networks and Internet of Things connectivity, the collection of data along the food supply chain has increased to a huge scale. However, this public and private data is characterized by increasing volumes, with extreme variety and velocity coupled with significant diversity and complexity, in many formats, types and languages, from data sources dispersed around the world, with missing values and insufficient contexts.

EFRA'S core ambition is to overcome these boundaries by exploring novel, experimental and promising approaches in extreme data mining, aggregation and analytics technologies. The first step of the project is to recognize and collect this wealth of heterogeneous data scattered throughout the internet, convert it into a "universal language" of high-quality risk food data able to train an AI model to proactively provide risk mitigation measures (based on predictive awareness of short- and long-term risks) with an explainable, secure, sensitive, accurate, trustworthy, fair and green manner, before food risks of contamination, quality or even fraud-happen.

“I am honoured to play a role in the EFRA project, which has the potential to revolutionize the way we tackle food safety issues. By utilizing advanced computer science techniques, such as federated AI learning and Natural Language Understanding, we aim to bring together the wealth of privately held food safety information and combine it with publicly available data to train groundbreaking AI models, while ensuring that the actual private data remain confidential and do not leave the company premises. Our goal is to use this technology to predict food safety risks, allowing for proactive preventative measures to be taken, which is truly a game-changer for the food industry.”

Manos Karvounis, Research & Innovation Manager at Agroknow and EFRA’s Project Coordinator.

The HPC Lab at CNR-ISTI will lead WP3 (Data Analytics & AI Prediction Models) focusing on the definition of novel sustainable machine/deep learning techniques to achieve good trade-offs between accuracy, latency and resource usage. It will also contribute to WP1 an integrated, energy-efficient cloud/edge HPC architecture and to WP4 the strategies for the re-allocation of cloud & HPC resources for greener operations.

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Let's keep in touch!

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