

## SAFEXPLAIN facilitates the safety certification of critical autonomous AI-based systems for a more competitive EU industry

Barcelona, 14 February 2023. - The [EU-funded SAFEXPLAIN](#) (Safe and Explainable Critical Embedded Systems based on AI) project, launched on 1 October 2022, seeks to lay the foundation for Critical Autonomous AI-based Systems (CAIS) applications that are smarter and safer by ensuring that they adhere to functional safety requirements in environments that require quick and real-time response times that are increasingly run on the edge. This three-year project brings together a six-partner consortium representing academia and industry.



Figure 1: SAFEXPLAIN consortium kick-off meeting in Barcelona

AI technology offers the potential to improve the competitiveness of European companies and the AI market itself is expected to reach \$191 billion by 2024 in response to companies' growing demand for mature autonomous and intelligent systems. CAIS are becoming especially ubiquitous in industries like rail, automotive and space, where the digitization of CAIS offers huge benefits to society, including safer roads, skies and airports through the prevention 90% of collisions per year and the reduction of up to 80% of the CO2 profile of different types of vehicles.

Deep Learning (DL) technology that supports AI is key for most future advanced software functions in CAIS, however, there is a fundamental gap between its Functional Safety (FUSA) requirements and the nature of DL solutions. The lack of transparency (mainly explainability and traceability) and the data-dependent and stochastic nature of DL software clash with the need for clear, verifiable and pass/fail test-based software solutions for CAIS. SAFEXPLAIN tackles this challenge by providing a novel and flexible approach for the certification – and hence adoption – of DL-based solutions in CAIS.

[Jaume Abella](#), SAFEXPLAIN coordinator, highlights that “this project aims to rethink FUSA certification processes and DL software design to set the groundwork for how to certify DL-based fully autonomous systems of any type beyond very specific and non-generalizable cases existing today.”

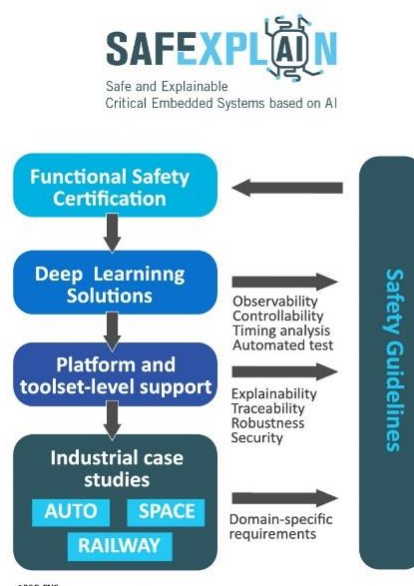


Figure 2: Overview of SAFEXPLAIN's vision



This project has received funding from the European Union's Horizon Europe programme under grant agreement number 101069595.

Three [cases studies](#) will illustrate the benefits of SAFEXPLAIN technology in the automotive, railway and space domains. Each domain has its own stringent safety requirements set by their respective safety standards, and the project will tailor automotive and railway certification systems and space qualification approaches to enable the use of new FUSA-aware DL solutions.

To benefit wider groups of society, the technologies developed by the project will be integrated into an industrial toolset prototype. Various IP and implementations will be available open source, along with specific practical examples of their use to grant end-users the tools to develop those applications.

### About SAFEXPLAIN

The [SAFEXPLAIN](#) (Safe and Explainable Critical Embedded Systems based on AI) is a HORIZON Research and Innovation Action financed under grant agreement 101069595. The project began on 1 October 2022 and will end in September 2025. The project is formed by an inter-disciplinary consortium of six partners coordinated by the [Barcelona Supercomputing Center](#) (BSC). The consortium is composed of three research centers, [RISE](#) (Sweden; AI expertise), [IKERLAN](#) (Spain; FUSA and railway expertise) and BSC (Spain; platform expertise) and three CAIS industries, [NAVINFO](#) (Netherlands; automotive), [AIKO](#) (Italy; space), and [EXIDA DEV](#) (Italy; FUSA and automotive).

