SAFEXPLAIN

Safe and Explainable
Critical Embedded Systems based on AI

Making critical autonomous AI-based systems safe

Deep Learning (DL) techniques are key for most future advanced software functions in Critical Autonomous AI-based Systems (CAIS) in cars, trains and satellites. Hence, those CAIS industries depend on their ability to design, implement, qualify, and certify DL-based software products under bounded effort/cost.

Objectives

To improve the **explainability and traceability** of DL components

To provide **clear safety patterns** for the incremental adoption of DL software in Critical Autonomous AI-based Systems (CAIS)

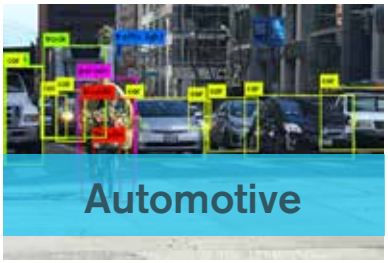
To integrate the SAFEXPLAIN libraries with an industrial system-testing toolset

To create **architectures of DL components** with quantifiable and controllable confidence, and with ability to identify when predictions shall not be released based on applicability's scope or security concerns.

To design, implement, or update selected representative **DL software libraries** according to the safety patterns and safety lifecycle considerations, meeting specific performance requirements on relevant platforms

Railway: This case studies the viability of a safety architectural pattern for the completely autonomous operation of trains (Automatic Train Operation, ATO) using intelligent Deep Learning (DL)-based solutions.

Space: This case employs state-of-the-art mission autonomy and artificial intelligence technologies to enable fully autonomous operations during space missions. These technologies are developed through high safety-critical scenarios.



Automotive: This case develops advanced methods and procedures that enable self-driving cars to accurately detect road users, estimate their distance from the vehicle, and predict their trajectories while adhering to both safety and explainability requirements.

Partners

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