

# **ANTI-COLLISION SYSTEM IMPROVEMENT FOR THE WORKPLACES SAFETY THROUGH ARTIFICIAL INTELLIGENCE SUPPORT**

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Load-handling vehicles, including forklifts, cranes, and other material handling equipment, play a crucial role in transporting goods, hazardous materials and heavy loads within chemical industry, warehouses, construction sites and manufacturing facilities. However, the improper operation, inadequate training, and insufficient safety measures related to these vehicles can lead to serious accidents with significant consequences.

The potential risks associated with load-handling vehicles include collisions, tip-overs, and the mishandling of loads, posing threats to both operators and bystanders. Inadequate visibility, limited maneuverability, and varying environmental conditions further contribute to the complexity of operating these vehicles safely. Accidents involving load-handling equipment can result in injuries, damage to goods and infrastructure, and even fatalities.

Therefore, addressing the challenges associated with the safe operation of these vehicles is essential to create a secure working environment.

In such a context, the aim of this work is the development of an anti-collision system that can reduce the risk of accidents by informing drivers of the presence of an obstacle (i.e. pedestrians, other vehicles). The system would be an upgrade of an anti-collision device, named Visual Guidance System (VGS), developed within the project SPRINCE (Smart PRocess INdustry CranEs), supported by the consortium SAF-ERA. The new system will be enhanced both in terms of hardware and software, enabling a real-time 3D reconstruction of the workspace and the recognition of obstacles that could pose a real risk, through artificial intelligence (AI) algorithms.