Introduction

The road is a dangerous killer. The number of road accidents is constantly increasing, and it is a real health and financial problem. According to a World Health Organization report, approximately 1.3 million people die each year in road accidents and between 20 and 50 million suffer non-fatal injuries. It is expected that by 2030, 2.4 million people will be killed in road crashes at the current rate and road accidents are predicted to become the fifth major cause of death. Reducing the number of accidents becomes a major concern for the public health.

With the high demand of reducing the number of road accidents, the Intelligent Transport Systems (ITS) has seen new technologies emerge to support its development. These technologies aim not only to improve the driving safety but also the road safety. With the emergence of intelligent transport systems and the presence of sensors which collect a huge amount of data. The data can be used to conduct real time predictions and give driving safety information. Thanks to the advances of artificial intelligence and new communication technologies, we can see the development of potential solutions to reduce the number of accidents on the road.

The driving safety can be improve thank to Vehicle-to-Everything (V2X). Vehicle to Everything (V2X) is a vehicular communication system that allows vehicles to share information with infrastructure, vehicles or pedestrians. The main purpose of V2X technologies is to improve road safety, energy savings and traffic efficiency by the exchange of real-time traffic updates and other road hazard information. According to the US National Highway Traffic Safety Administration (NHTSA), increasing the use of V2X technology could significantly reduce the number of road accidents. In a V2X communication system, the information is exchanged from the vehicle sensors through high-bandwidth, high-reliability links.

By sharing information, such as speed or braking, with the surrounding entities, the technology allows vehicles to act and take measures to avoid accidents by increasing the driver’s awareness. It also enhances traffic efficiency by warning drivers of upcoming traffic.

There are two potential communication technologies that enables V2X: Dedicated Short Range Communication (DSRC) and C-V2X based on Long-Term Evolution (LTE) cellular communications.

Artificial intelligence coupled with V2X technology would then allow cars to analyze their environment thanks to the data collected by the sensors and to be able to communicate this information with nearby vehicles.

The objectives of the present paper are twofold: first we implement two image recognition algorithms, one using the YOLO convolutional neural network and the second a Cutting-Edge convolutional neural network. The purpose of these algorithms is to detect possible obstacles or users surrounding the car so that if necessary to communicate the information to warn other cars of the danger. Secondly, we compare the efficiency of the two algorithms to define which one would be better able to conduct real-time predictions.