Tecnológico de Monterrey
Mexico City Campus
School of Design, Engineering and Architecture
Department of Mechatronics Engineering

A.D.M.A.S.
Advanced Driver Monitoring for Assistance System

Communication between driving system and actuators in the vehicle

ADMAS PROJECT

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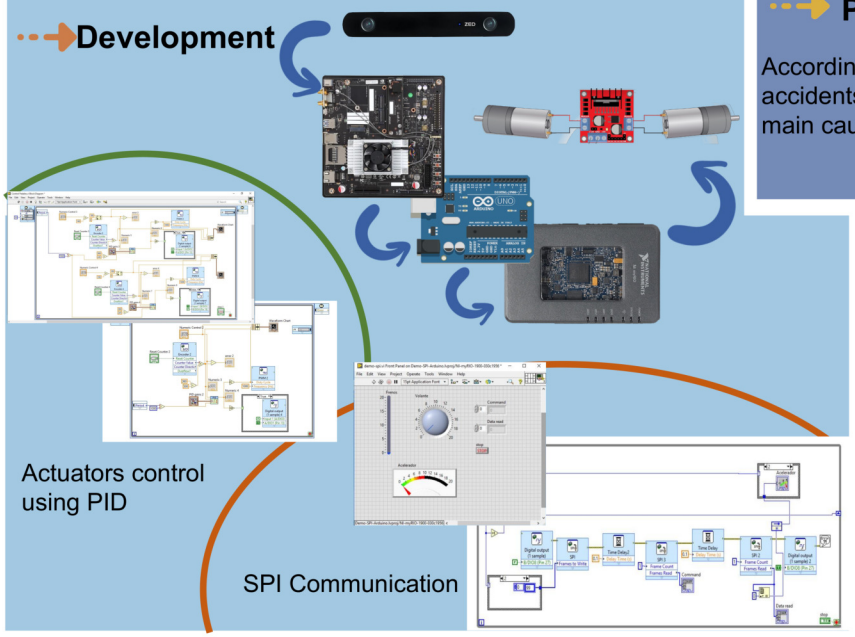
IEEE

CIMB
CENTRO DE INVESTIGACIÓN EN MICROSISTEMAS Y BIODISEÑO

Development



Problematic

According to WHO, 90% of the deaths caused by traffic accidents occur in low and middle income countries and is the main cause of death in people between 15 and 29 years [1].

Objectives

General Objective

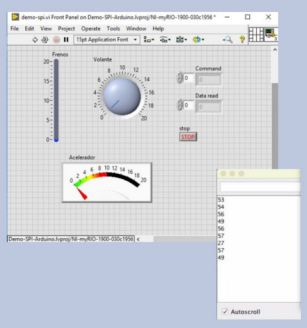
Integrate a control system and a communication system capable of receive signals and control actuators to generate a semi-autonomous driving vehicle.

Particular Objective

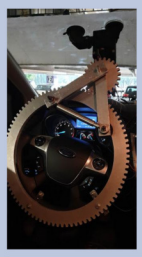
Perform the communication between the myRIO card and the Arduino microcontroller and develop a control system for the mobility of the actuators through the MyRIO card.

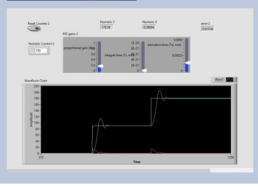
Results

SPI Communication



Physical tests





Future work

- Complete migration of the communication protocol to SPI in order to eliminate the intermediary (Arduino)
- Possibility of increase the number of cards or sensors to make the car more autonomous.

Conclusions

The communication protocol of this project must be fast, reliable and multidirectional, the objective was met using the SPI protocol.
The control system of the actuators was robust enough to return to its preset reference even with disturbances, with an error rate between 0 and 3 degrees approximately and with an optimal time for an autonomous vehicle.

1. Anónimo. (2018). Lesiones causadas por el tránsito. De Organización Mundial de la Salud Sitio web: http://www.who.int/es/news-room/fact-sheets/detail/road-traffic-injuries