Advanced Driver Assistant System (ADAS),

Automatic Accident Detection and Alert System in Developing (AADAS) Countries with minimal road Safety Measures, Case Study: Buea and Muyuka (2016-2020)

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Brief introduction

Purpose:

The aim of this paper is to design a prototype and a simulation of an ADAS and verify its effectiveness on the road

Introduction

Background:

Road Traffic accidents are a frequent phenomenon among youths ,and in general among the population which is due to the fact that some of these youth are beginning to experience “real driving” on high ways and on express roads and also due to the dilapidated roads.

Credit: Vert Rouge Jaune (Facebook)

BUEA MOLYKO ACCIDENT YESTERDAY

“Accident between a military truck and a pickup vehicle in Molyko around the Police Station. Some civilians are feared dead at least one confirmed.”

“Two lecturers at the University of Buea have reportedly perished in a car accident along the Tiko-Douala Highway yesterday.” Source: Journal du Cameroun

” Tangwa Ledzemo Stephanus died after his car crashed into a tree around the GCE Board area in Molyko early on Sunday morning.” Source: Journal du Cameroun

“Ghastly Road Accident; 18 Dead along Ekona-Muyuka Highway”…” Sixteen members of the Molyko-Buea based Choral group called Wana wa Wonja, their driver and the truck driver all died on the spot with only the assistant to the truck driver who survived and is responding to treatment in hospital.”

“Atleast two people have died in a car accident in Molyko - Buea, South West Region on Friday, 20th October 2017.” Source crtv.cm

These are some of the few cases of Road Traffic deaths due to road accidents as

reported by local media

Credit: Fakonewscenter.com

Causes of Accidents.

high speed, drunk and driving, diverting minds (answering a phone or texting while driving), over stress,

AADAS is a detection system that alerts the driver if their attention on the road is loss, or if they are over speeding (it alerts them to reduce their speed)the system alerts the driver when it notices that the vehicle is not under his attentive control, if the driver does not take control(it stops the car, do nothing) and if an accident occurs it initiates a call to the ambulance emergency unit or send an SMS(and also send the GPS location of the accident), while alarming and calling for help and the police unit ,the unit

agencies must now dispatch the closest health respondents to the scene or the unit agent must direct the those at the scene to the closest hospital

The alert could be continues(screaming,) or it sends an alert or SMS via GSM MODULE to the the telecommunication company of the registered number , where the company can now place a call to the closest emergency unit(the ambulance could try and stabilize the patient if the meet half way) which could mean the difference between life and death

The system is activated by strong vibrations which are captured by vibration sensors

SMS is sent via GSM module to the closest hospitals to major highways and notorious accident spots

The device at the hospital access the location of the vehicle through GPS module

Each ambulance will have a civilian GPS receiver (GPS navigation system)

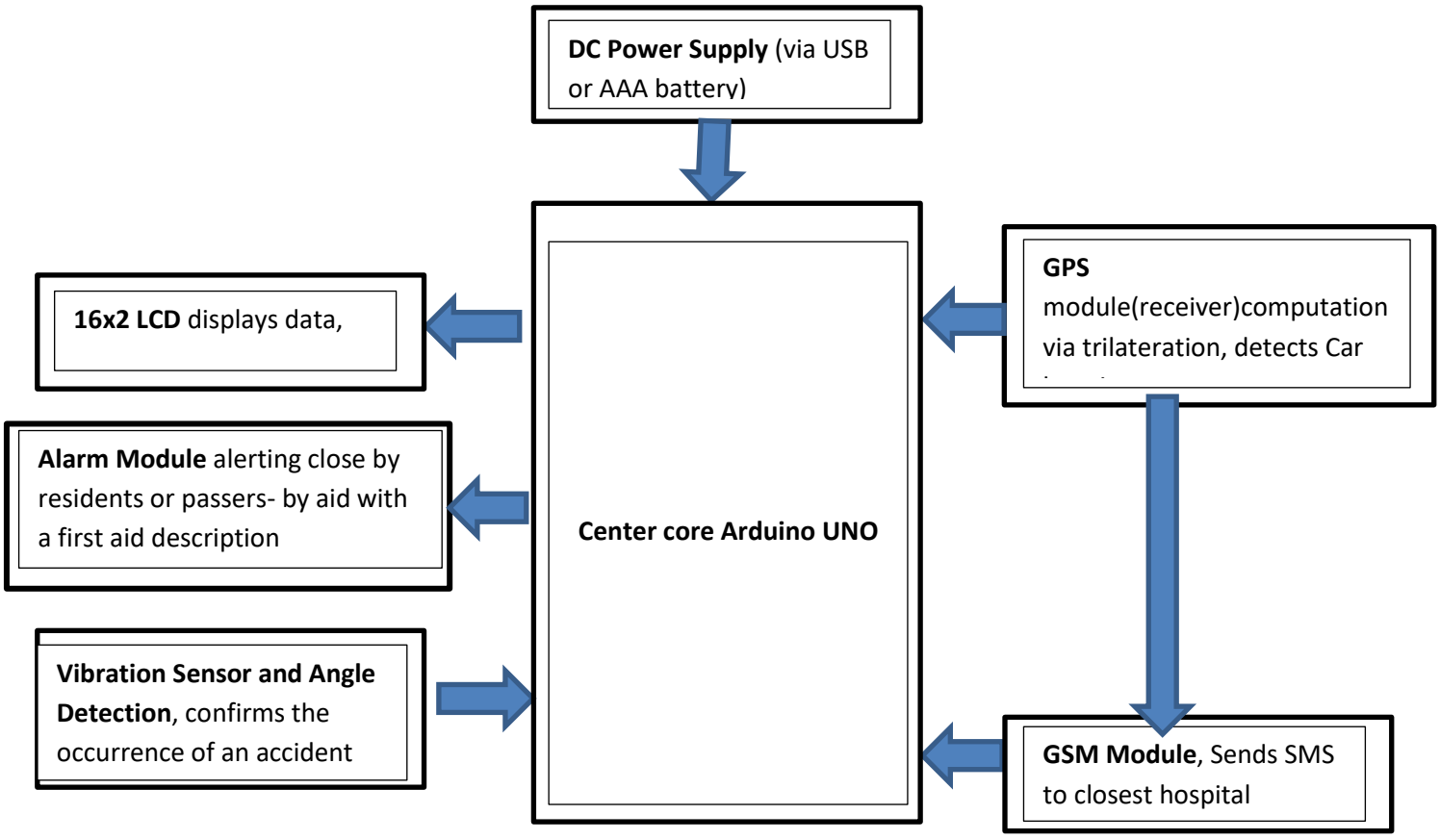
Vibration sensor module

What existed before? Airbags great invention in 1968, TPMS to regulate tire pressure with respect to terrain

the School Traffic Controllers Project in Buea & Limbe developed by CAROSAF

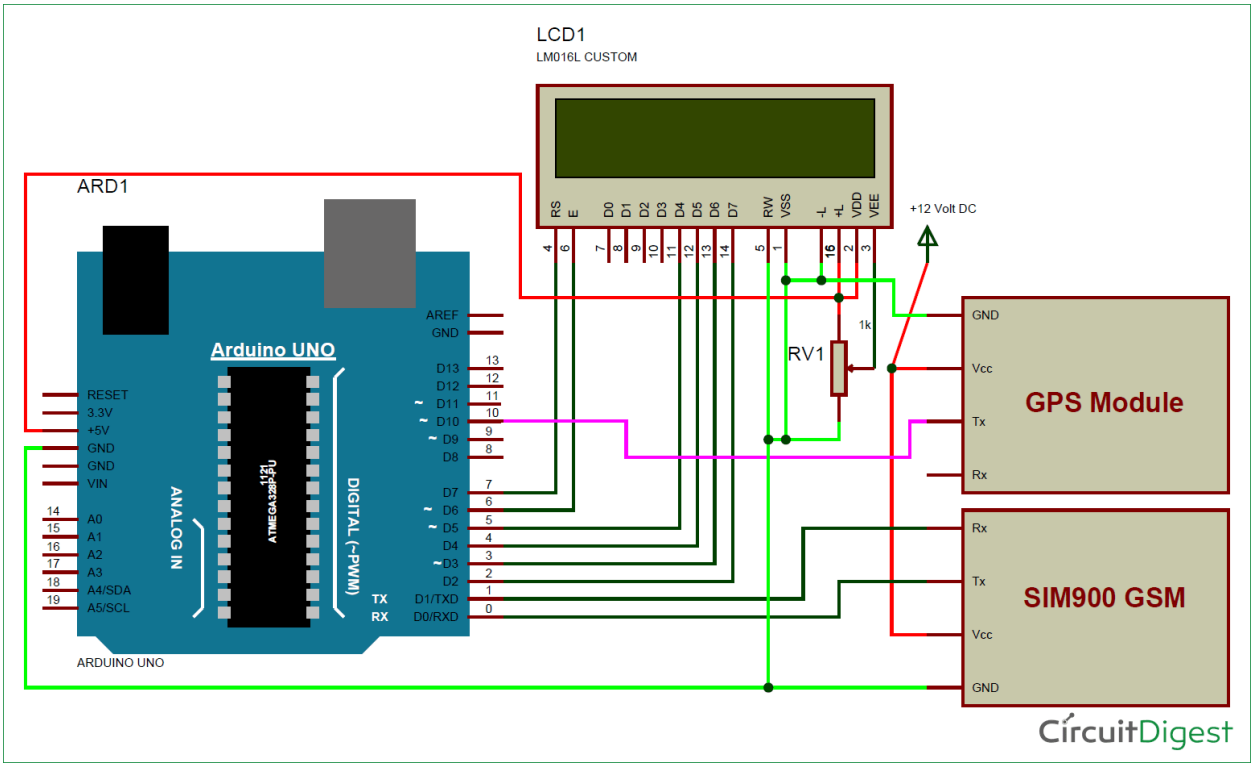
-MEMS, detect angle of the vehicle, IOT and cloud computing systems,

Schematic Diagram of the AADAS



- periodic Road Safety sensitization campaigns in collaboration with the ministry of Transport

In Cameroon, road accidents are one of the leading causes of death. On the triangular road network, Douala-Yaoundé-Bafoussam-Douala, popularly known as “le triangle de la mort” (triangle of death), averagely 100 deaths are registered within a month. 2010 holds the record for deaths on Cameroon’s roads for the past 05 years (between 2010 – 2014) registering 3,269 deaths. The consumption of alcohol, even in relatively small amounts increases the risk of being involved in a crash for motorists and pedestrians



Working Module of the AADAS

Simulations using Arduino or Model Sim

The Arduino is used as the microcontroller which controls all the modules in the circuit, the GPS USED to received coordinates of the vehicle, GSM used to send SMS to the registered phone number, LCD used f or displaying status message and coordinates, the vibration sensor acts as the initial accident detection module, GSM will send the received coordinates to the user through SMS, the GPS send s the location of the vehicle to the micro controller which is then send to then send to the GSP module

Conclusion

The AADAS is an automatic accident detection and alert system device that uses an Arduino micro controller at its core, it uses a GPS location which can be sent through tracking systems, the vibration sensor initiates the whole process

Other ADAS systems,

Safety features are designed to avoid collisions and accidents by offering technologies that alert the driver to potential problems, or to avoid collisions by implementing safeguards and taking over control of the vehicle. Adaptive features may automate lighting, provide adaptive cruise control and collision avoidance, pedestrian crash avoidance mitigation (PCAM), incorporate satnav/traffic warnings, alert driver to other cars or dangers, lane departure warning system, automatic lane centering, show what is in blind spots, or connect to smartphones for navigation instructions.

Early advanced driver-assistance systems include electronic stability control, anti-lock brakes, lane departure warning, adaptive cruise control and traction control.

ADAS relies on inputs from multiple data sources, including automotive imaging, LiDAR, radar, image processing, computer vision, and in-car networking. such as other vehicles, referred to as Vehicle-to-vehicle (V2V), or Vehicle-to-Infrastructure (V2X), such as mobile telephony or Wi-Fi data network systems

FUTURE SCOPE:

The proposed system deals with the detection of the accidents. But this can be extended by providing medication to the victims at the accident spot. By increasing the technology we can also avoid accidents by providing alerts systems that can stop the vehicle to overcome the accident

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