Adaptive Headlights

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Abstract- *"Adaptive Headlights" are an active safety feature designed to make driving at night or in low-light conditions safer by increasing visibility around curves and over hills. When driving around a bend in the road, standard headlights continue to shine straight ahead, illuminating the side of the road and leaving the road ahead of you in the dark. Adaptive headlights, on the other hand, turn their beams according to your steering input so that the vehicle's actual path is lit up.*

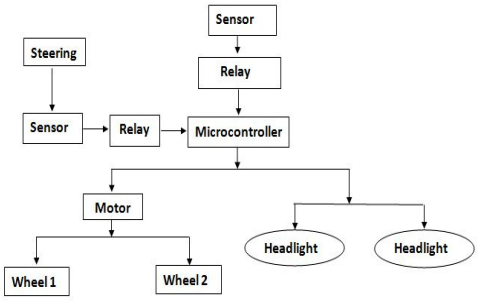
The major problem hindering safer and more comfortable driving is the driver and his/her limited reaction time in the presence of changing road conditions. An aim of development in active safetyis to reduce the reaction time of the driver by improving visibility and thus achieve a significant increase in road safety and driving comfort

I. INTRODUCTION

Adaptive headlight systems are made up of several subcomponents that are monitored and controlled by an Microcontroller. The subcomponents include:

Wheel speed sensors that monitor the speed of rotation of each wheel; a steering input sensor that monitors the angle of the steering wheel; andStepper motors attached to each headlight. The data from the sensors are interpreted by the microcontroller ,which then determines the vehicle's speed, and the angle and length of the curve it is negotiating.

The microcontroller directs the motors attached to each headlight to move the beam to the degree specified by the microcontroller Most adaptive headlight systems can turn the headlights up to 15 degrees per side. Newer versions of the advanced headlight system have even larger ranges of motion.



Passive and active safety systems have been developed in R&D activities to produce vehicles that will perform at the highest level of safety and ensure comfortable driving under various conditions

II. LITERATURE SURVEY

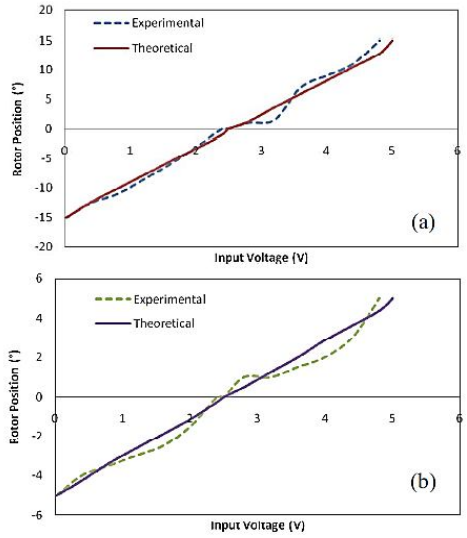
The Embase, Ovid and PubMed databases were chosen to conduct the literature search into the application of adaptive design methodology. The review was constrained to phase II, phase III or phase II/III RCT's with patients diagnosed with cancer that presented primary outcome trial results and were published in 2015. Eligible papers should indicate the use of adaptive design methodology, papers should be full text publications in the English language and accessible. Duplicate records were excluded based on the title, authors, abstract and year of publication. All required data were extracted and recorded on an excel spreadsheet.

The definition that will be used to identify the application of adaptive design methodology will be any potential modifications made to the trial/statistical procedure that is either prospective, ad-hoc or retrospective. The first halogen headlamp was officially unveiled in 1962 in Europe and became mandatory in several countries except the United States that used non-halogen sealed lamps until 1978. However, thanks to their capability of producing more light than traditional lamps using almost the same amount of power made halogen headlights the most popular around the world, with most automakers still using them on their latest models.

III. METHOD OF SOLUTION

To put this whole system into practical use, there are several critical functions that need to be tested and analysed. The first critical function is to determine whether the head lights or motors are moving as desired prior to the rotation of the potentiometer which represents the steering wheel. The second function is the response time of the motor i.e. the time taken for the headlight to move from one position to another. Finally, the headlight will be installed on a car to see how effective it is. The theoretical results have been compared with the experimental results as shown in Figure 5.1. In this experimental test, the input voltage variable is measured by a multi-meter, whereas the frequency of the signal is measured

by using an oscilloscope, and the motor position is measured using protractor



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IV. CONCLUSION

The design and build of steerable headlights from conventional static headlamps has been achieved. Moving the headlights from left to right or vice versa continuously corresponding to a sensor is achieved. An advantage of the developed headlight system is in its high adaptability as it can be easily configured to fit within space confines of a variety of vehicle designs. Indeed, the latter provides a bending lamp that allows for significant angular displacement of the light beam of a headlamp assembly without excessive light beam distortion and without the need to move the entire headlamp assembly. Furthermore, the system is of inexpensive, simple and dependable assembly

V. FUTURE WORK

- New sensory systems and sensory fusion is to be explored to plug additional information to the control system.
- This work can be extended to include different maneuvers tomake the driving system capable of dealing with all driving environments.
- Future issues may also include an algorithm for autonomous formation of the cooperative driving.

Thus, with the current and growing awareness of the importance ofsecurity, trustworthy vehicle autonomous systems can be deployed in fewyears.

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