

## Projector Light Control and Fuzzy Based Control for EDOC in Electric Vehicle for Two Wheelers

M. Jeyamurugan, P. Ramnath, R. Velmurugan, M. Vignesh, R. Yuvarajsoman

K.L.N. College of Engineering, Pottapalayam, Sivagangai, India.  
jeyam3182@gmail.com, ramnathraja935@gmail.com, vel2001raj@gmail.com,  
vigneshvirumandi59@gmail.com, yuvarajsomanr@gmail.com.

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### ABSTRACT

Projector light control mainly focus on the battery management in an e-vehicle. This provides a long time journey without any unnecessary wastage of the battery. This may be used in all sort of e-vehicle. The system can replace the hardware components of the Electric vehicles in Two wheelers and does not need extra equipment. The size and volume EDOC is reduced to control electric drive onboard converter (EDOC) using Fuzzy in the DC (battery) side. To automate the projector light in an E-vehicle for two wheeler to reduce the battery consumption.

**Keywords:** Electric drive on-board converter, EDOC, fuzzy control, electric vehicle, battery management, projector light control, microcontroller.

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### INTRODUCTION

In recent times it seems that the availability of fossil fuels (Petrol, Diesel) are decreased. In addition to the depletion of fossil fuels, the existing model of vehicles emits Carbon-di-oxide, and other harmful gases. Hence most of the people are prefer to Electric vehicles. The system can replace the hardware components of the Electric vehicles in Two wheelers and does not need extra equipment. The size and volume EDOC is reduced

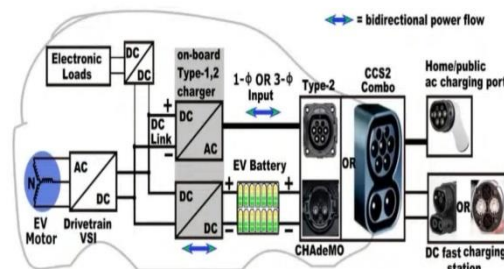


Figure 1: Electric Drive On-board Converter

## Background

In recent times, the e-vehicle especially two wheelers are facing a burning of battery problem, this is because of the over charging/over loading of the battery. Lithium ion battery has less time to burn. Hence we need an alternative for the Lithium ion.

## Objective

- To control electric drive onboard converter (EDOC) using Fuzzy in the DC (battery) side.
- To automate the projector light in an E-vehicle for two wheeler to reduce the battery consumption.

## LITERATURE REVIEW

### Background Theory

In the existing model, there is no control for the Projector light used in two wheeler, and also they have not implemented the fuzzy control in the Electric On-Board Converter (EDOC).

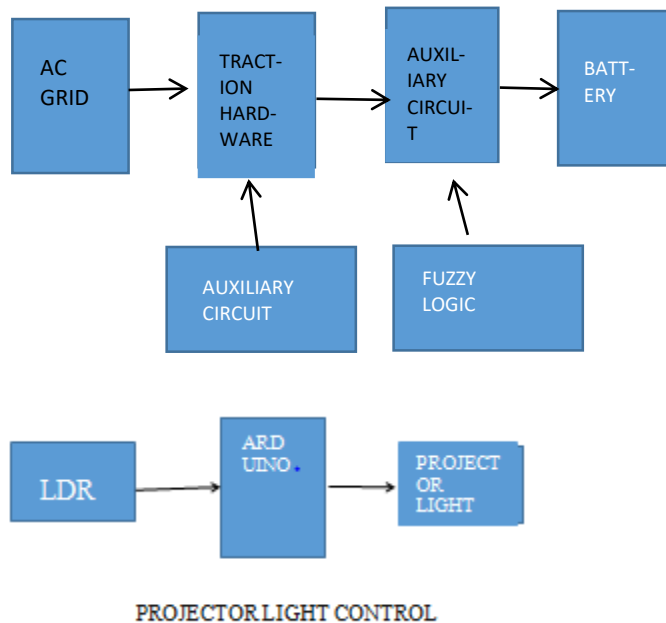
### Previous Studies

In The study the following were noted:

- Presents the optimal adaption law for any type of adaptive energy consumption minimization strategy (ECMS) in charge-depletion mode for plug-in HEVs
- The smart automatic tracking device utilizing GPS, GSM module and reduction in the power consumption of this system is achieved with the help of LDR.
- Built to optimize electrical power consumption.

## METHODOLOGY

### Electric Drive On-board Converter



### Data

The data to be collected are the light intensity around the light, maximum and minimum light intensity, the error signal generated by the switches on the On-Board Converter.

### Model Development

The project works when in the day time the light intensity around the light is high, hence the projector light will be in Off mode and in the evening the light intensity around the light will be low, hence the projector light will be in On mode. And the error speed of the motor is detected and an error correction signal is sent to the switches and a speed of the motor is corrected hence we can increase the efficiency.

### Method

- We are controlling the electric drive onboard converter (EDOC) using Fuzzy in the DC (battery) side.
- EDOC when connected to the power grid through the power outlet at the office or home, there is no additional equipment needed (relay) on the AC side
- The LDR which is placed on the surface of the vehicle sense the Atmospheric light intensity and gives it as input to the Arduino

- If the input intensity is less than the fixed intensity then the projector light is turned ON unless it is turned OFF.

## DATA ANALYSIS AND RESULTS

### Result

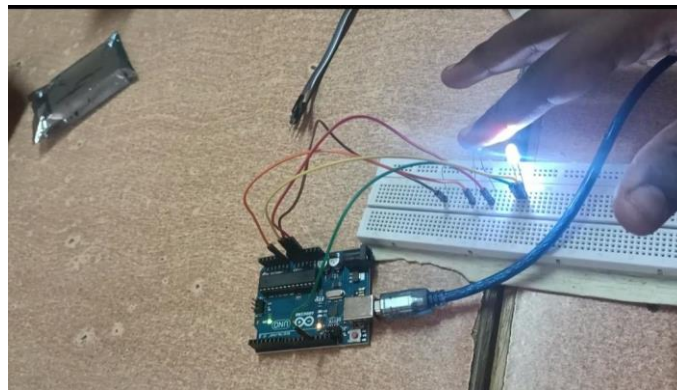


Figure 2: Result of Projector Light Control

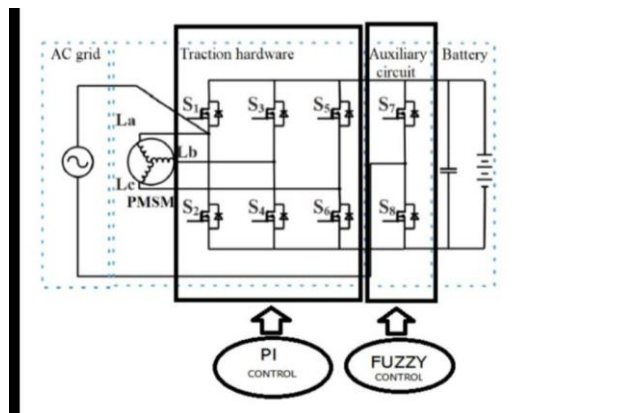


Figure 3: Result of Fuzzy Based EDOC

TYPE	VOLTAGE	CURRENT	POWER	TIME	PHASE	RANGE	EXAMPLE
1.	120 V AC	19 A	Upto 3.3 kw	7-17 hrs	Single	3-8 km/hr	Orion
2.	230 V AC	80 A	6.6 kw-19.3kw	0.4-7 hrs	Single or Three Phase	Upto 60 km/hr	Siemens

Table 1: Result For Fuzzy Control.

## Robustness Test

The experiments are done with the optimum condition and the results are gained. This experiment is done for almost two to three trials. We have done a robustness test to ensure the performance of our project. All the time of testing, our project gave the same result.

## Analysis

We have analyzed that the experiments should be done with at most care. The connection must be given correctly to ensure that no short circuit happens.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

As they are using conventional electrical on-board converters the efficiency is minimal. Hence we are switching to fuzzy control on-board converter. And on the other side the battery management is achieved by using projector light control to a certain limit.

### Recommendation

We recommend to give the connection with good quality equipment and should be insulated properly.

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Advisor

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## BIOGRAPHY



**M. Jeyamurugan. M.E,**

Assistant Professor (Sr.Gr)/EEE,  
K.L.N. College of Engineering, Pottapalayam,  
Guide Of The Project.



**P. Ramnath**

B.E/Electrical and Electronics Engineering,  
K.L.N. College of Engineering, Pottapalayam.  
Project Team Leader



**R. Velmurugan**

B.E/Electrical and Electronics Engineering,  
K.L.N. College of Engineering, Pottapalayam,  
Assistant Project Team Leader



**M. Vignesh**

B.E/Electrical and Electronics Engineering,  
K.L.N. College of Engineering, Pottapalayam,  
Project Team Member



**R. Yuvarajsoman**

B.E/Electrical and Electronics Engineering,  
K.L.N. College of Engineering, Pottapalayam,  
Project Team Member



## APPENDICES

### Appendix 1

As far we have gathered, mostly they are using Lithium ion battery which is known for its heating. As we charge the battery it gets heated hence there is a huge change for the bursting of the battery which causes a severe damage to the user. Hence they are replacing the battery with Lithium ferrophosphate. And they are using a hub motor instead of a normal motor which increases the performance as well as it reduces the size.