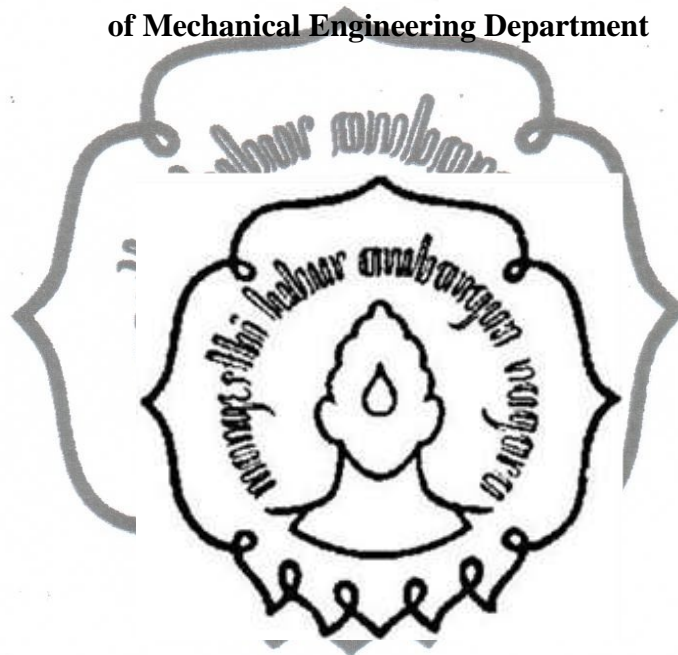


**DESIGN AND DEVELOPMENT OF FAST BATTERY  
CHARGER PWM BASED ON FUZZY LOGIC CONTROL  
TECHNIQUE**

**THESIS**

**Organized to Meet a Part of the Requirements to Achieve the Master Degree  
of Mechanical Engineering Department**



**By:**

**NAJI ABDALAZIZ ALI**

**S951208517**

**POSTGRADUATE PROGRAM  
UNIVERSITAS SEBELAS MARET  
SURAKARTA**

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**2015**



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**By**

**NAJI ABDALAZIZ ALI**


**S951208517**

Supervisor Board	Name	Signature	Date
Supervisor I	Prof. Muhammad Nizam S.T., M.T., Ph.D. NIP. 197007201999031001		19/2015 08
Supervisor II	Prof. Dr. Dwi Aries Himawanto, S.T., M.T. NIP. 197403262000031001		10/2015 08

**Fulfill the Qualification**

**On Date .....**

Head of Master Program of Mechanical Engineering  
Postgraduate Program of Sebelas Maret University

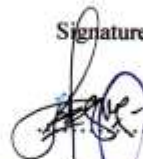

  
Dr. Triyono, ST., MT.  
NIP. 197406251999031002

**SUPERVISOR ENDORSEMENT**  
**DESIGN AND DEVELOPMENT OF FAST BATTERY**  
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**THESIS**

**NAJI ABDALAZIZ ALI**  
**S951208517**

Approved By Team Examiner

Title	Name	Signature	Date
Head	Dr. Eng. Agung Tri Wijayanta, ST, M.Eng. NIP. 197108311997021001		2015/08/11
	Syamsul Hadi, ST, MT NIP. 197106151998021002		6/8/15
Member	Prof. Muhammad Nizam S.T., M.T., Ph.D. NIP. 197007201999031001		10/2015
	Prof. Dr. Dwi Aries Himawanto, S.T., M.T. NIP. 197403262000031001		10/2015

**Examination on**  
**Date July 2015**

Director of Postgraduate Program of  
 Sebelas Maret University  
  
**Prof. Dr. M. Furqon Hidayatullah, M.Pd.**  
 NIP. 1960727 198702 1 001

Head of the Program  
 Mechanical Engineering  
  
**Dr. Triyono, ST., MT.**  
 NIP. 197406251999031002

**NAJI ABDALAZIZ ALI**, NIM: S951208517, 2015. **Design and Development of Fast Battery Charger PWM Based on Fuzzy Logic Control Technique**, Supervisor: **Prof. Muhammad Nizam S.T., M.T., Ph.D.** Co-Supervisor: **Prof. Dr. Dwi Aries Himawanto, S.T., M.T.** Thesis, Postgraduate Program in Mechanical Engineering. **Sebelas Maret University, Surakarta, Indonesia.**

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### ABSTRACT

*Battery charging is an essential and crucial issue regarding the cycling life and performance of batteries. The objective of this study was to design and promote the fast battery charger based on fuzzy logic control technique. In this study, a fuzzy-logic-control-based (FLC-based) LiFePO battery charger was experimented. The proposed charger takes the voltage and current of battery into account, and adjusts the pulse width modulation (PWM) duty cycle accordingly. The result showed that the proposed battery charger has the potentiality to retain speed up time charging upto 33% at 2C current rate, which is less than existing economical speed up time charging. Besides, at fuzzy logic condition the rate of efficiency at 1C, 2C and 2.5C were 77, 82 and 81% respectively, while in case of without fuzzy logic condition it were 77, 76, and 75 at at 1C, 2C and 2.5C. In future this charging system can be utilized in various fields including electric vehicles and many other portable devices.*

**Keywords:** Electric Vehicle (EV), Fuzzy Logic Controller, LiFePO , PWM

---

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Surakarta, July 2015

Sincerely,

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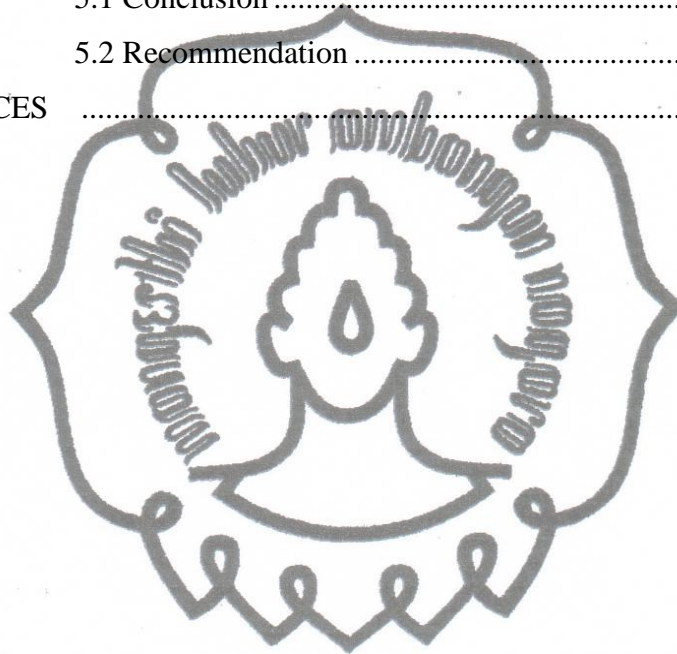
**NAJI ABDALAZIZ ALI**

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