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**Faculty of Graduate Studies for Statistical Research**

**Department of Computer Science**

**The Smart Battery Charger**

**A Project Presented for Fulfillment**

**For Diploma Project in Computer Science**

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* **Abstract:**

In recent decades, smart devices have played the most significant role in human’s life, and power consumption has been one of the most trending issues. As a result, batteries and their lifespan have been one of the most sophisticated topics.

We propose to design a device that automate charging process by protecting the human from headache of monitoring percentage of charging periodically.

* **Declaration:**

We here declare that the project entitled “The Smart Battery Charger” submitted for all training centers, and educational institutional, which serve the student affairs in smart and automated way.

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| --- | --- | --- | --- |
| No. | Name | Task | Signature |
| 1 | Mohamed Sayed Hemed | Hardware Implementation  (Design circuit & write low level codes) |  |
| 2 | Sherif Mostafa Samy | Software Implementation  (Design interfaces & writing code) |  |

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## NTRODUCTION

In recent decades, smart devices have played the most significant role in human’s life, and power consumption has been one of the most trending issues. As a result, batteries and their lifespan have been one of the most sophisticated topics. We propose to design a device that automate charging process by protecting the human from headache of monitoring percentage of charging periodically.

Motivation

The motivation for designing this application came for some reasons:

As students in computer science department, laptop is one of the most important tools for us, so we want to save its battery’s life cycle as much as we can. This is the first serious contribution to overcome this issue by building an intelligent device from scratch that save batterie’s life, which based on Embedded Systems by combining software with hardware.

## Problem Definition

Batteries do not have an infinite lifespan. Most battery manufacturers claim that their products have a 300-500 cycle rating. After this, batteries would be unable to carry as much energy and will only be able to fuel the computer for limited periods of time [qur21] The wrong way of charging Lithium-Ion batteries which included in laptops leads to decrease batterie’s lifespan by 25% which in turn lead to replace them frequently, as well as frequently and randomly power outage which lost user’s work. Leaving the battery connected to the charger when the battery is completely charged while you are using it may lower battery lifespan if you do it repeatedly [sam21] “So, a good range to aim for when charging a Li-ion battery is from about 40% to 80% in one go. Try not to let the battery drop below 20%” [qur21] As battery’s cost has risen, it is necessary to save money and enhancing batteries’ performance, so solving this problem now not later is the correct chosen.

* 1. **Background**

## Related works:

Examples of websites that concerns with search rather than booking Madaresegypt : [**http://madaresegypt.com/ar**/Accessed](http://madaresegypt.com/ar/Accessed) 1/6/ 2018

portal.mohesr: [**http://portal.mohesr.gov.eg/ar-eg/Pages/default.aspx**/Accessed](http://portal.mohesr.gov.eg/ar-eg/Pages/default.aspx/Accessed) 5/6/ 2018 emis: [**http://emis.gov.eg**/Accessed](http://emis.gov.eg/Accessed) 10/6/ 201

* **Definitions, Acronyms, and abbreviations (Glossary)**

|  |  |
| --- | --- |
| UML | [Unified Modeling Language](https://en.wikipedia.org/wiki/Unified_Modeling_Language) |
| UAT | User Application Test |
| MCU | Microcontroller |
| IDE | Integrated Development Environment |
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