Sudan University of Science and Technology

College of Engineering

School of Electronics Engineering

Design of:

Smart Elevator

Control System

A Research submitted in partial fulfillment for the requirements of the Degree of B.Sc. (Honors) in Electronics Engineering

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قال

{آتوني زبر الحديد حتى إذا ساوى بين الصدفين قال انفخوا حتى إذا جعله نارا قال آتوني أفرغ عليه قطرا (96) فما اسطاعوا أن يظهروه وما استطاعوا له نقبا (97)قال هذا رحمة من ربي فإذا جاء وعد ربي جعله دكاء وكان وعد ربي حقا (98)}

صدق الله العظيم

سورة الكهف الآية {96-98}

Dedication

To my family, Words cannot express how grateful I am to my father and my mother for all the sacrifices that you've made on my behalf. Your prayer for me was what kept me going this far, it was the incentive I needed to strive towards my goal. last but not least, I would like to express my appreciation to my friends and colleagues who never stopped supporting me.

Acknowledgments

It is a great pleasure, a privilege, an honor, a source of much personal satisfaction, to be taught by all of you great teachers. First of all, I must insist I have not done this work alone. Many people have helped me through my way to keep our research project alive and if you will bear with me, for just a few moments, I believe that the present context is an appropriate one in which to express how my heartfelt much gratitude.

Before I say anything more, I want to thank our Supervisor

*Dr. **Ala Eldeen Awouda***

Who has always been there to listen and give advices. We are deeply grateful to him for the long discussions that helped us sort out the technical details of our work. We are also thankful to him for encouraging the use of correct grammar and consistent natation our writings and for carefully reading and commenting on countless revisions of this manuscript.

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And to All our School Professors and to our colleagues.

Our teacher Ahmed Humaida

Abstract

With the major advance in the building and the vertical development in the multi-level buildings, the need for the transporting between those buildings' floors easily and fast became very important, and therefore the use of the elevators increased to do this job efficiently to save time and costs.

The purpose of this research is to construct a circuit that is able to control a three levels elevator model so it can perform the elevator function to shift between the floors according to the orders and the priority of them and being able to determine the exact position of the elevator at any time so it can know when exactly to stop.

This circuit was achieved using the proper microcontroller. And by programming the microcontroller so it can control the elevator using servo motor and knowing the position using the right kind of sensors.

المستخلص

مع التطور العمراني الهائل والتقدم الكبير في المباني ذات الطوابق المتعدده تكون الحاجة شديدة للتنقل بين هذه الطوابق بسهولة وسرعة. ولهذه ازداد الطلب على المصاعد لأداء هذه الوظيفة فاعلية لتوفير الوقت والجهد.

الهدف من هذا البحث هو بناء دائرة قادرة على التحكم في نموذج لمصعد كهربائي يتحرك في ثلاثة طوابق بحيث يقدر على القيام بمهام المصعد والتنقل بين الطوابق بناء على الاولوية والطلب والمقدرة على معرفة موقع الغرفة في أي لحظة لتحديد وقت الوقوف المناسب.

تم تحقيق هذه الدائرة عمليا باستعمال متحكم دقيق,وعن طريق برمجة المتحكم الدقيق يتم التحكم في المحرك ومعرفة

موقع الغرفة باستخدام محساسات مناسبة.

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List of Abbreviations:

AC	*Alternative current*
ADC	*Analog to digital convertor*
AVR	*Automation voltage regulator*
DC	*Direct Current*
FSR	*Force sensitive resistor*
ID	*Identification*
LCD	*Liquid Crystal Display*
LCU	*Logic control unit*
LDR	*Light dependent resistor*
LED	*Light Emitting Diode*
MCU	*Micro control unit*
PWM	*Pulse width modulation*
RC	*Resistor capacitor*
RFID	*Radio frequency identification*
RISC	*Reduce instruction set computer*