

***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  
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وكان وعد ربي حقا (98)}

صدق الله العظيم

سورة الكهف الآية  
{98-96}



## ***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.*

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

***Dr. Ala Eldeen Awouda***

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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 برجة المتحكم الدقيق يتم التحكم في المحرك ومعرفة

موقع الغرفة باستخدام محساسات مناسبة.

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### List of Abbreviations:

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