



FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING
FINAL YEAR PROJECT REPORT

TOPIC:

SMART ERGONOMIC CHAIR

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A final year project report submitted to the Department of Computer Engineering as a partial fulfillment of the requirements for the award of a Bachelor of Sciences degree in Computer Engineering.

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DECLARATION

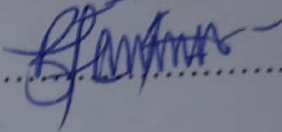
I **UNGEIRWOTH ALBERT** declare that all the material portrayed in this project proposal report is original and has never been submitted in for award of any Degree, certificate, or diploma to any university or institution of higher learning.

UNGEIRWOTH ALBERT

DATE

26/07/2023

SIGNATURE

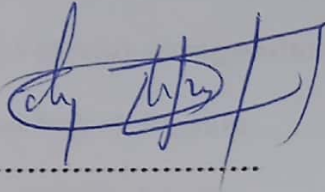


APPROVAL

This is to certify that the project under the title "SMART ERGONOMIC CHAIR." has been done under my guidance and supervision and is now ready for examination.

DR. ODONGTOO GODFREY

Department of Computer Engineering



Signature:

26/01/23

Date:

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ABSTRACT

Ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.

Ergonomics is important because when doing a job and a body is stressed by an awkward posture, extreme temperature, or repeated movement, musculoskeletal system is affected. The body begins to have symptoms such as fatigue, discomfort, and pain, which is the first signs of a musculoskeletal disorder.[1]

The main objective of this project is to design a smart ergonomic chair that reminds the user of the chair of incase they have sat in a bad sitting posture and in case they have sat for long on the chair, they are reminded to take a break off the chair.

This system consists of 4 force resistor sensors, 3 attached at the seat to align the thigh position and the backside of the user of the chair and 1 at the backrest of the chair to align the back (spinal cord of the user). It also has ultrasonic sensor that detects the head position of the user. If the head position is not within the range or angle form the head rest, a buzzer is triggered on, and the LCD displays a “bad sitting posture please adjust!” This will create the consciousness in the users to always adjust and sit properly. This helps reduce the risk that comes with a bad sitting posture like back ache, neck pain among others.

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CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

This section describes what is contained in chapter one of this literature.

This chapter contains the background of this proposals, which is the global picture of the topic of the study “A smart ergonomic chair”. This chapter also contain the problem statements, it contains the objectives of this topic of research i.e., both the main and the specific objectives. It also contains the justification/ significance of this research topic. Finally, it contains the scope of this research i.e., the technical, geographical and the time scope.

1.2 BACKGROUND

Ergonomics is the scientific study of human work. More specifically, ergonomics is the science of designing the job to the worker rather than physically forcing the worker’s Body to the job[2]. Ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance [3].

Globally over the past decade, there is 25 percent increase in the individuals suffering from musculoskeletal conditions due to bad sitting postures. Ergonomics emerges as a concern because majority of these musculoskeletal conditions are related to computer use, improper workstation design and faulty posture [2]. In long term, the workplace deficiencies surpasses the body’s coping mechanisms, resulting in pain, mental stress, decreased performance and poor quality of work [4]. Neglecting these issues has resulted in disabling injuries urging one to change One’s profession [5] .Since in the current world, it’s almost impossible to imagine that someone can live without computers[6]. They have become an electronic device of almost every day use for individuals of every age. Inappropriate use of computer increases the risk of health problems especially the musculoskeletal disorders [7]. Working for prolonged period in an ergonomically deficient work place has led to Musculoskeletal Disorders (MSDs). [8]. Practice of ergonomics improves Working efficiency, comfort and easiness to use without compromising

5.5 REFERENCES

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