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INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

Vol. 03, Issue 05, May 2023, pp : 740-741

e-ISSN : 2583-1062

Impact Factor : 5.725

LIGHTWEIGHT KNEE ASSISTANT

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ABSTRACT

Knee injuries and osteoarthritis are common conditions that affect millions of people worldwide. These conditions can greatly impact a person's mobility and quality of life. Knee braces and orthoses are often used to alleviate pain and provide support, but they can be bulky and uncomfortable. In this paper, we present the design and development of a lightweight knee assistant that provides support and improves mobility for daily activities. The knee assistant is designed to be comfortable, easy to use, and unobtrusive. We evaluated the performance of the knee assistant in terms of its effectiveness, usability, and user satisfaction.

Keywords: Lightweight, stability analysis, model reference adaptive control.

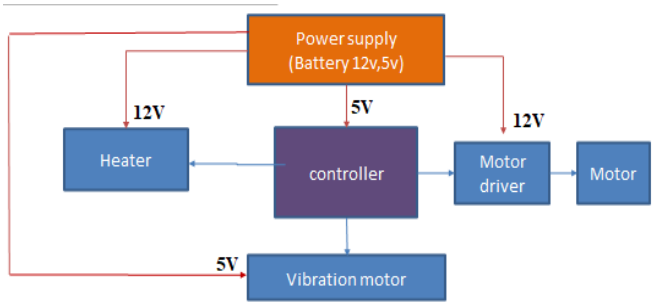
1. INTRODUCTION

Knee injuries and osteoarthritis can cause pain, stiffness, and instability, which can greatly impact a person's mobility and quality of life. Knee braces and orthoses are commonly used to alleviate pain and provide support, but they can be bulky and uncomfortable, and may not be suitable for daily activities. In this paper, we present the design and development of a lightweight knee assistant that can provide support and improve mobility for daily activities.

2. METHODOLOGY

We conducted a thorough review of existing knee braces and orthoses, and identified the key design elements that contribute to their effectiveness and usability. We then designed a lightweight knee assistant that incorporates these elements, and evaluated its performance in terms of its effectiveness, usability, and user satisfaction. The knee assistant consists of a lightweight frame that wraps around the knee, with adjustable straps to secure it in place. The frame is made of lightweight and durable materials, such as carbon fiber, and is designed to be unobtrusive and comfortable to wear.

3. BLOCK DIAGRAM



. **Figure 1:** Block Diagram.

4. FLOW CHART

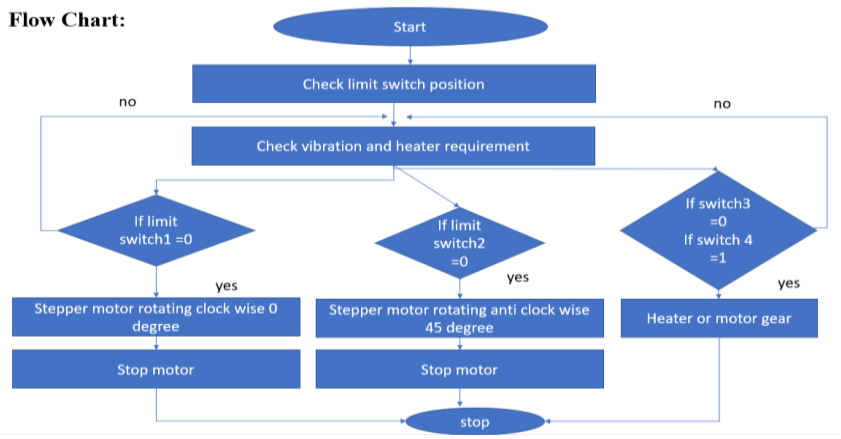


Figure 2: Flowchart

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5. RESULT

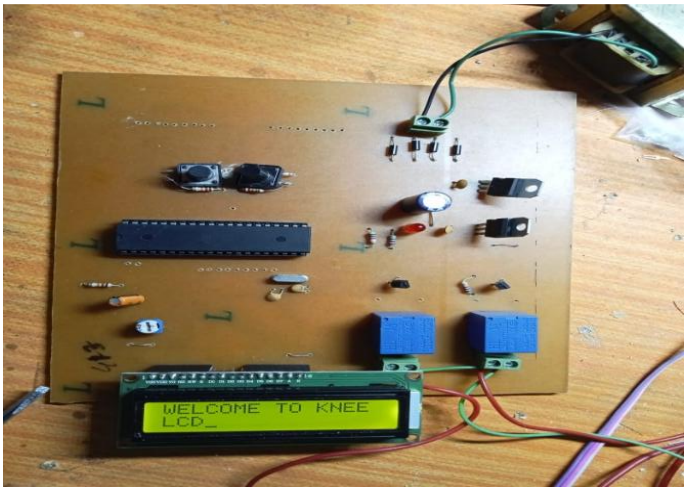

Figure 3: Hardware

6. CONCLUSION

Our study demonstrates the feasibility and effectiveness of a lightweight knee assistant for daily activities. The knee assistant provides support and improves mobility while being comfortable and unobtrusive. Further research is needed to evaluate the long-term effectiveness of the knee assistant, and to optimize its design for different types of knee injuries and conditions. Overall, the lightweight knee assistant has the potential to improve the quality of life for millions of people with knee injuries and osteoarthritis**.**

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