

Mechatronics and Making

Mid-Term Project Report

Exoskeleton Robotic Hand With

Wolf Claw Mechanism

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1 Introduction

1.1 Project Objectives and Description

1.2 Similar Mechanisms

1.3 Industrial Applications

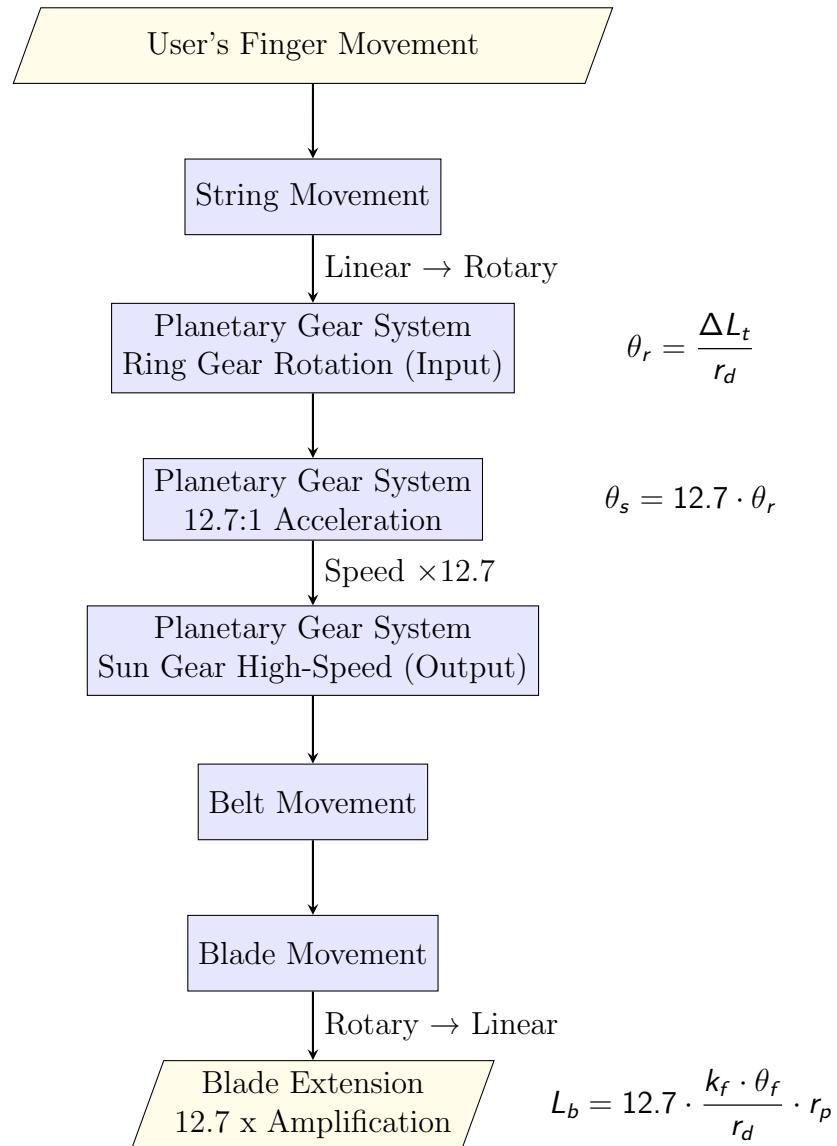
2 Mechanical and Mechanism Analysis

2.1 Drive Method and Transmission

This robotic hand exoskeleton uses an acceleration-based machinery system. Therefore, the movements of the finger will be amplified by this mechanism.

This mechanism can do that through a planetary gear mechanism, whereas a belt system and a string transmission system are also needed.

Details of the transmission process shows below:



2.1.1 Transmission Process Details

User's Input (Finger Movement)

The linear movement of the string that is deployed over the finger is created by the finger's flexion.

Figure 1 has two sub-figures: Figure 1(a) Describe the details and data when finger curved, Figure 1(b) Describe the details and data when finger extended.

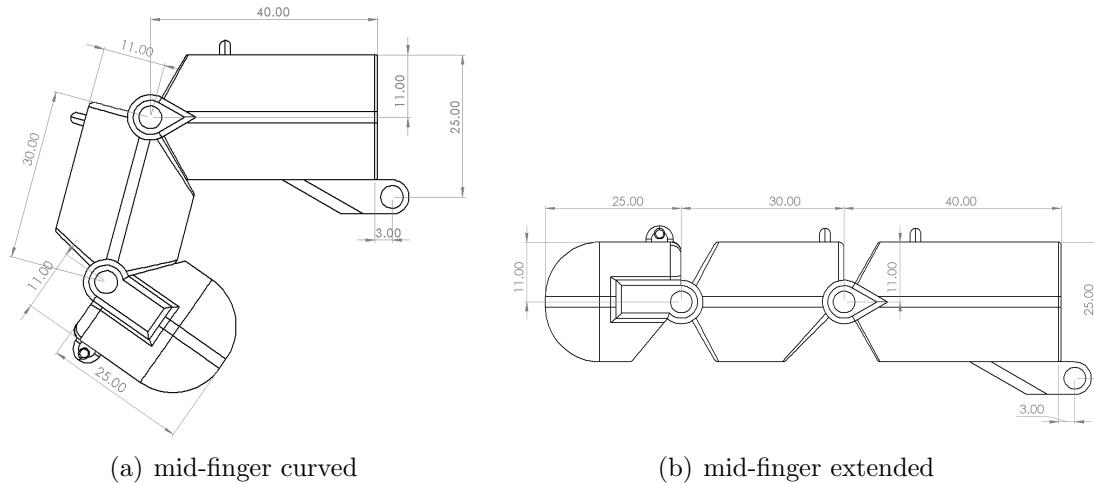


Figure 1: mid-finger exoskeleton design

Total displacement of the string overhead by calculation:¹

$$r = 0P = 0$$

2.2 Fingers and Wrist Mechanisms

2.3 Wolf Claw Mechanism Comparison

2.3.1 Version 1: Planetary Gear

2.3.2 Version 2: Compound Gear Train

3 Mathematical Modelling and Analysis

3.1 Fingers and Wrist Modelling

3.2 Wolf Claw Mechanism Version 1: Planetary Gear

3.3 Wolf Claw Mechanism Version 2: Compound Gear Train

4 Conclusion and Future Work

References

[1] author. title. In editor, editor, *booktitle*, year.