

Mechatronics and Making

Mid Project Report

Exoskeleton Robotic Hand With

Wolf Claw Mechanism

Bryan Li – SN 25003333

Yan Pei Zhu – SN 25001234

Nolan Yu – SN 25001234

October 31, 2025

Contents

1	Introduction	2
1.1	Project Objectives and Description	2
1.2	Research Applications and Mechanical Choice	2
2	Conceptual Design	2
2.1	Finger Exoskeleton	2
2.2	Wolf Claw Mechanisms	2
2.3	Wrist Joint	2
3	Mathematical Modelling and Analysis	2
3.1	Driving Method and Transmission	2
3.2	Wolf Claw Mechanism - Version 1 (Planetary Gear)	2
3.3	Wolf Claw Mechanism - Version 2 (Compound Gear Train)	2
3.4	Fingers and Wrist Kinematics	2
4	Mechanical Analysis	2
4.1	Drive Method and Transmission	2
4.2	Wolf Claw Mechanism Comparison	2
4.3	Finger Motion Analysis	2
5	Conclusion and Future Work	2
5.1	Conclusion	2
5.2	Future Work	2
6	References	2

1 Introduction

1.1 Project Objectives and Description

1.2 Research Applications and Mechanical Choice

2 Conceptual Design

2.1 Finger Exoskeleton

2.2 Wolf Claw Mechanisms

2.3 Wrist Joint

3 Mathematical Modelling and Analysis

3.1 Driving Method and Transmission

3.2 Wolf Claw Mechanism - Version 1 (Planetary Gear)

3.3 Wolf Claw Mechanism - Version 2 (Compound Gear Train)

3.4 Fingers and Wrist Kinematics

4 Mechanical Analysis

4.1 Drive Method and Transmission

4.2 Wolf Claw Mechanism Comparison

4.3 Finger Motion Analysis

5 Conclusion and Future Work

5.1 Conclusion

5.2 Future Work

6 References