

# Design of a Portable Control Platform for Rod-Driven Continuum Parallel Robots

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*To my mother, Gildes Ester.*

Success is the sum of small efforts, repeated day in, and day out.

— Robert Collier

# Abstract

This project focuses on the design and development of a portable, modular, and scalable platform and control system for the actuation of rod-driven continuum parallel robots. The primary objective was to create a versatile mounting solution that enables the efficient movement of such robots in various applications. The platform facilitates the deployment and operation of the robots in diverse environments, providing flexibility and ease of use.

The project involved the design and construction of the mounting platform, as well as the development of the control interface. Additionally, a rod-driven continuum parallel robot was designed and implemented, with a focus on miniaturization and optimization of the structure. The novel approach involved wire structures interconnected by rings to restrict rod movement, with innovative ring joints designed to enhance stability and performance.

# Acknowledgements

I want to thanks to God...

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# Chapter 1

## Introduction

This is the introduction.

### 1.1 Objectives

#### 1.1.1 General Objective

To design and develop a portable, modular, and scalable platform with a control system for the actuation of rod-driven continuum parallel robots.

#### 1.1.2 Specific Objectives

- Adapt an existing design of a rod-drive continuum parallel robot optimizing for size.
- Design linear actuators that provide precise control and dexterous movement.
- Fabricate the components and assemble a working physical prototype of the platform.
- Implement a customized language specification for programming the linear actuators.
- Develop an application to interface with the control system using the created protocol.
- Conduct experimental testing and validation of the system.



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