Contents

1. Introduction
   1. Cable Bending Testing System
   2. Why are we doing?
2. Theoretical Background
   1. Control Setup
   2. PI Controller
   3. Optimization Methods
   4. Tfest- Explain the Mathematics Behind it.
3. Related Works
   1. **Basketball Robot: Ball-on-Plate with Pure Haptic Information**
   2. **Ball on the plate balancing control system.**
4. Methodology
   1. Proposed Models- Mention the other methods and which method we selected and why.
      1. System Identification Method
         1. Matlab Program- explain how the entire program works
   2. Testing and Experiments
      1. Explain How the test was carried out in the lab.
   3. Labview implementation
      1. Explain how the final system is planned to be included to the main system through Lab View
5. Results and Analysis
   1. Results
      1. Optimized Values of Kp and Ki for different Order Systems
   2. Analysis
      1. Influence of Order of the system in output
      2. How to select the optimized order to get the optimized Kp and Ki
6. Conclusion and Future Works