KUKA LBR iiwa — Adaptive Assembly Analysis

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***Abstract*—This paper presents an analysis of the KUKA LBR iiwa robot's ability to perform rigid-body assembly tasks. The analysis is based on the first YouTube video presented in the prompt of the final exam. The video shows the robot's ability to adapt to the environment and perform manufacturing assembly tasks.**

***Index Terms*—KUKA, LBR iiwa, assembly, analysis**

I. Introduction

The KUKA LBR iiwa robot is a 7-axis robot that is capable of performing rigid-body assembly tasks, as shown in the YouTube video [1]. As per the data sheet of the robot, it is capable of performing assembly tasks with a payload of 7–14 kg, depending on the model. Its maximum reach is 800–820 mm depending on the model.

Fig. 1. KUKA LBR iiwa in its workspace from the video

In the video, the robot is first shown in its workspace, showing a HRC-suitable gripper. A drain valve, a connector for the drain valve, and a connection for the hoses are shown. A still from the video is shown in Figure 1.

After the setup is shown, the robot is shown performing the assembly tasks. The first part shows the utilization of the joint torque sensors for process recognition. The second part of the video shows the usage of the joint torque sensors for force-controlled joining processes. The third part of the video shows the safety features of the robot.

Our objective in this paper is to analyze the robot kinematics and dynamics being used in each of the three parts of the video. We will also describe how one would simulate the tasks being performed by the robot in MATLAB, using the Robotics ToolBox.

II. Materials and Methods

A. Analysis of first part

References

[1] *LBR iiwa - Adaptive Assembly*. KUKA YouTube, Sep 2014. [Online]. Available: LBR iiwa - Adaptive Assembly