Justification

The scope of the project proposed for the hospital involves a robotic arm which is employed to separate and dispatch medication kits at the pharmacy for the patients. The work cycle of the arm is expected to be twenty-four hours long, which admittedly puts an enormous strain on the robot, which can lead to fatigue and mechanical defects. Also, despite not being determined, the number of patients admitted at the hospital daily is high, which leads to an also high number of medication kits dispatched. Therefore, the robot's workload is expected to be very high and, thus, there is also a high need for check-ups and maintenance.

Regular maintenance can extend the robot's estimated lifecycle and is an important step in maintaining the workflow. For this reason, it is ideal to understand the maintenance cycle of the robot and the need for . It is also important to consider that the maintenance process of the robotic arm would hinder the flow of medication kit dispatch and therefore impair the pharmacy's workflow. For this reason there is a need for planning and resource allocation to fill the robot's workload during the maintenance period.

Conceptually, the purpose of this work is to analyze the behavior of the robotic arm Kinova during various cycles of work, and to verify the arm's movement precision. For this purpose, a number of tests with the arm is proposed, during the course of a day, at several random days, which aim to simulate a real work day at the hospital. In each test, the final position of the arm is measured through a camera in the arm, which photographs the end point of the movement, which corresponds to the end position of the movement, ideally, the same fixed point for every single test. The photographs are then analyzed through image processing to determine if there is variation in the final position of the arm in each movement, related to the fixed position. The end point of the movement is reached through an algorithm which simulates the dispatch of a medication kit at the pharmacy.

This data may, then, be used to statistically estimate the frequency of maintenance and calibration of the arm at the hospital, considering the workload and time of operation as primary factors, through methods yet to be defined.