

ELEC 390
Urine Bag Project
Mid-Project Report

Kaan Toyaksi - 64815

Deniz Karadayı - 59925

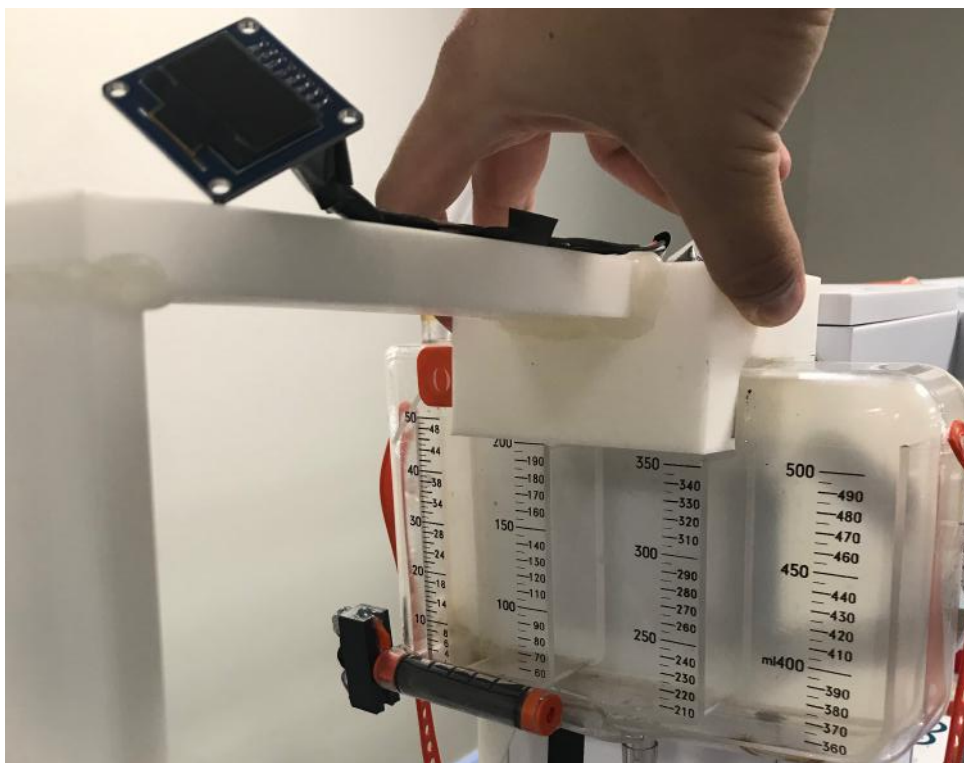
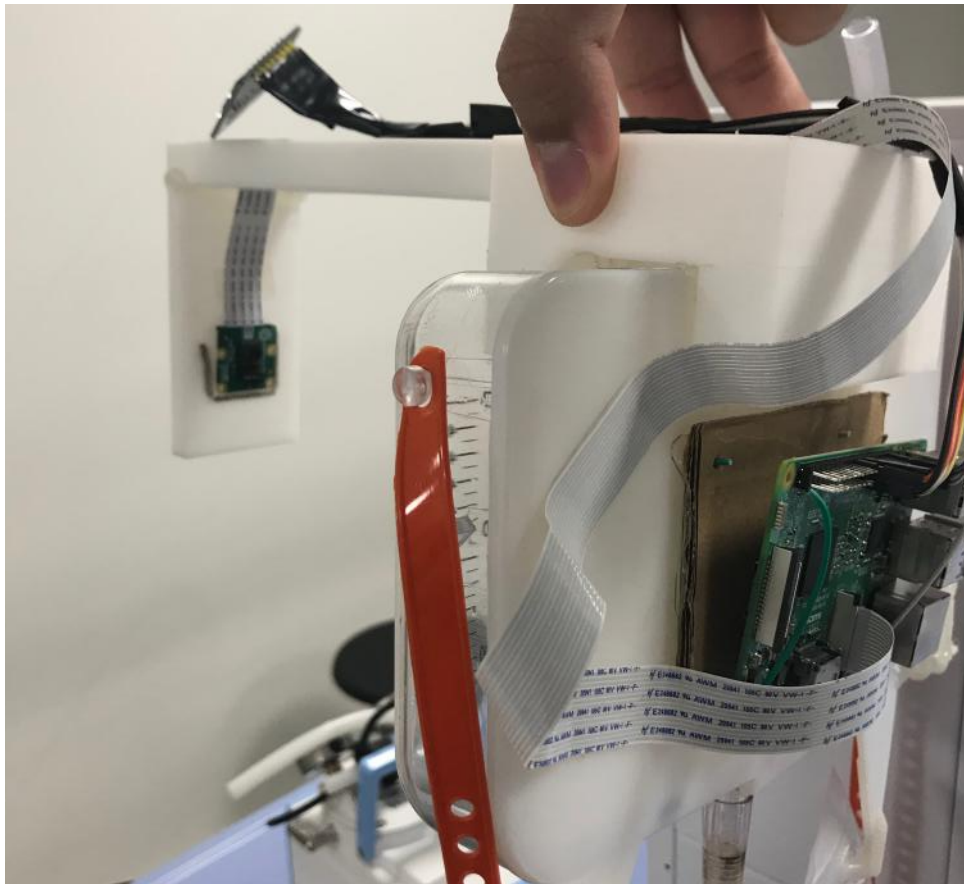
Objective and Methods

In this project, our objective was to measure the urine volume in a urine bag for ICU patients. To achieve this objective, we tried to use different methods. First of these methods was volume measurement using a camera. In this prototype, we measured the volume change by using colour detection which allows us to do simple urine analysis along with volume detection. After we finished this prototype the conditions of the ICU were not suited for this kind of setup, and camera was too expensive to implement it every types of bags. Therefore, we moved on to a different approach at the beginning of the semester.

Second method we tried was measuring the volume by using flow rate. In this setup, we used 2 resistive sensors that can detect liquid presence. These sensors allows us to detect the flow speed and flow length of the passing liquid from a particular part of the urine pipe. By knowing the cross sectional area of the pipe and the length between sensors, we should have been able to measure the volume of the passing liquid. Unfortunately this method was not suitable for urine volume detection because of the “coanda effect” of liquid which leads liquid to stuck on the surface of the pipe while proceeding. Thus, it give measurement error since the liquid does not fit the whole cross sectional area, and it is not predictable movement to be optimised.

Hence, we are now trying a third approach including the hard plastic bag part of the system since it is not stable to work on the pipe. We are going to use the same resistive sensors that will be located on the hard plastic part of the urine bag to measures the volume. The system will be placed on a mechanical rig which can move the sensors up, down and sideways and detect the level of the liquid on the bag. Each specific place of the sensor will be indicating a different volume level. Therefore, we will be able to have a discrete knowledge about the liquid amount in the bag. After the semester break, we will hope to start and finish this prototype.

Volume Measurement with Camera



Volume Measurement with Flow Rate

