Opportunity and Significance

A human Scrub nurse takes a lot of effort and knowledge to serve the doctor during a surgery. The robot scrub nurse listen to the tool requested, pick it up and give to the doctor through the Alexa voice device. Jerry can assist without getting tired and also can respond for different names for the same tool.

Technical Objectives

Create a Robot Scrub nurse that it is able to listen the required medical tools and hand the doctor. Using Alexa voice device, MATLAB and Arduino control a robot prototype.

Related Work and State of Practice

The project required robot kinematic background. Also know the MATLAB GUI programming. For the voice command, it was necessary to understand how to built and host Alexa skills. In addition, electronics and Arduino background.

Technical Approach, Accomplishments and Results

The project started from the MATLAB GUI. For that it was necessary to figure out the D-H parameters for the robot model and with that develop the forward and inverse kinematics. The Arduino board is also connected with the MATLAB to send the commands for each robot joint-motor. Finally, MATLAB receive the commands from Alexa and demands Arduino to perform them.

Next Steps for Development and Test

The Project is being developing process. It is planned to include a camera to the system to locate the tools in case they are in a different position. Deep Learning will be used to teach neural network to recognize the tools. We also plan to add a track tool system to make sure that none of the used objects had been left inside of the patient.

Commercialization Plan & Partners

The project has been devoted for 4 graduate student. We plan to improve even more the system to look for investments and further industry commercialization. The robot Scrub Nurse has as target clients the hospitals. It can be very useful during exhausting procedures. Besides of improve the timing.

References

- Craig, J. (n.d.). Introduction to robotics.