

Huan-Yang Chang

Team G: Excalibr

Teammates:

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EXCALIBR

ILR06

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Happy Chinese New Year

Individual Progress

1. Team work management

In this semester, we would start to use real robot arm and also conduct the camera sensor and color correction. The work can be expected more challenge than last semester. However, with the last year experience, we all more clearly to do our own work. When reviewing the lesson, we noticed the two things was crucially important, clear goal/work description and work breakdown. As a team manager, I tried to organize the team in the end of winter break to discuss our spring semester goal and path with the sponsor. Besides, we also make new requirements and test plan for that. The weekly meeting with the sponsor at Friday will also be held to track and monitor the progress.

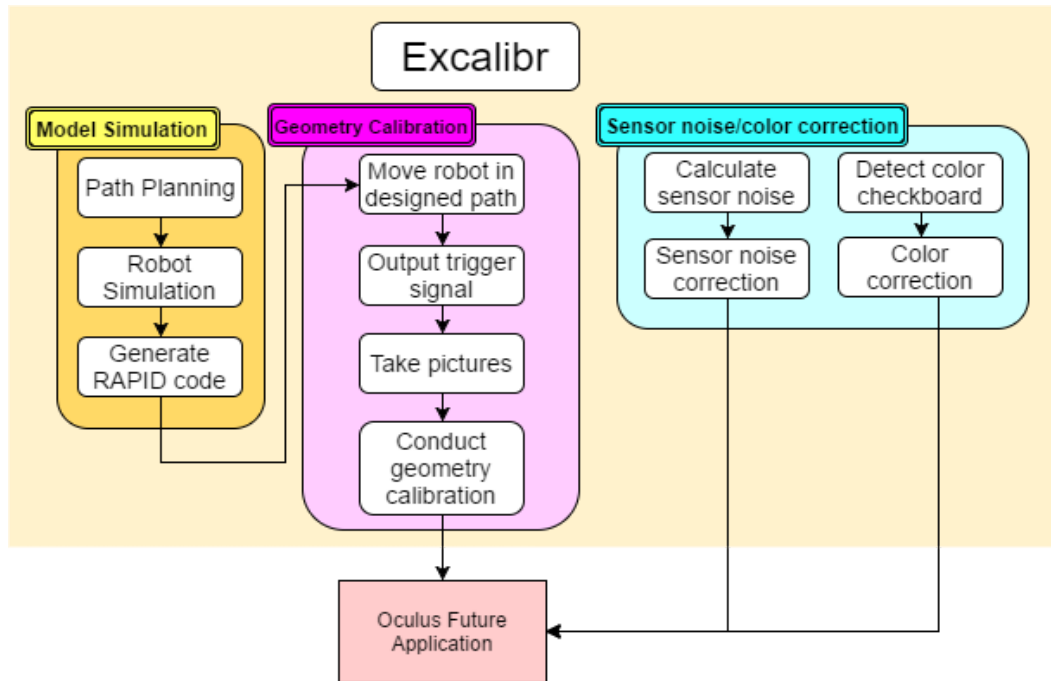


Fig 1. Function architecture

And we also conduct the critical path method to find out the critical path and find out that the robot arm path was most critical and adjust the task “learn how to use real robot arm” earlier to make the whole schedule not that tight. By setting these key landmarks of the project, I believed that team G will be more confident and capable of dealing with the challenge in this year.

2. Building environment model for the dome

In the first step in robot arm control part was robot simulation. We would base on the RobotStudio to create the robot and environment model for further testing and concept proving. In the environment modeling, I just model the dome, floor, and light because that are the things that were fixed in the dome and stayed inside the dome when calibration was conducting.

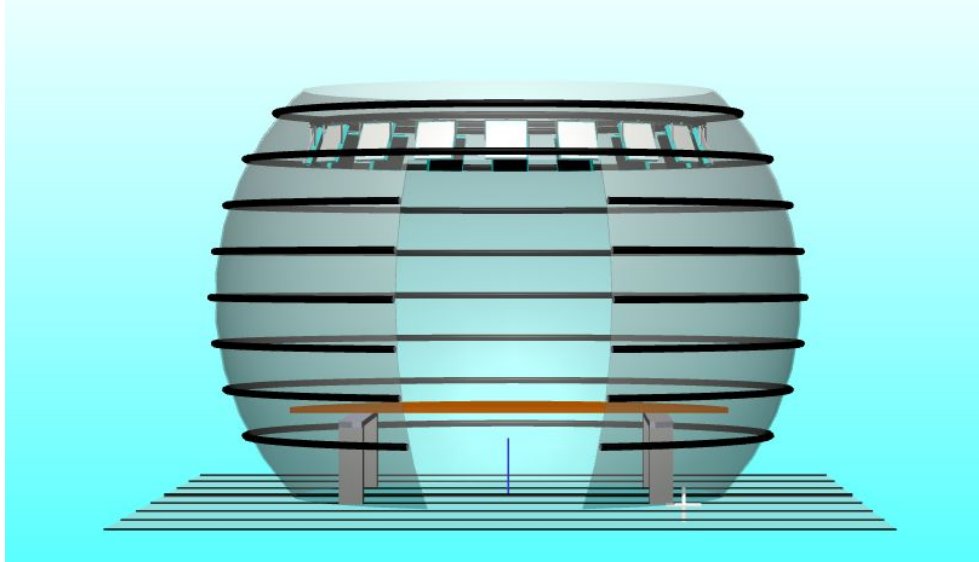


Fig 2. CAD model of the dome

In order to set the safe work space for future application, I also referred the datasheet of the ABB robot arm and aligned with the CAD model to get the collision-free workspace.

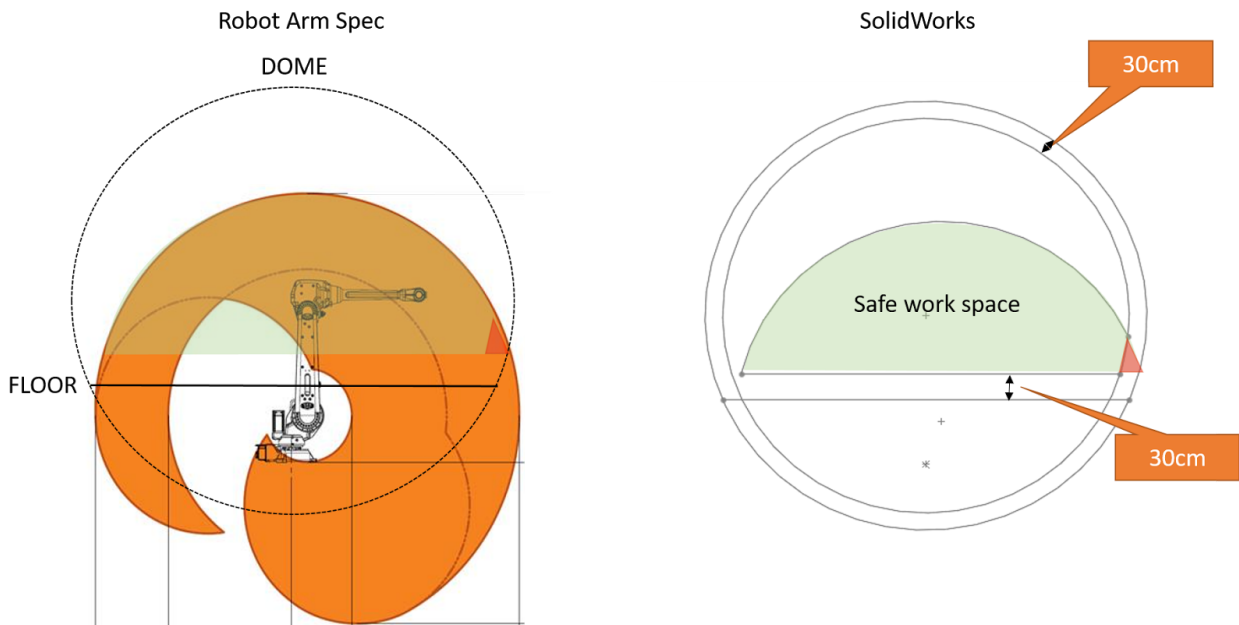


Fig 3. Safe workspace

Besides, now the robot simulation could perform the simple movement of the robot arm control and ready to conduct the next step.

Challenges

1. Robot arm configuration problem

In our project, there should be a process to load a designed set of points and then generate the valid RAPID code for ABB robot arm. However, the function provided in the RobotStudio

was not able to solve every configuration issue in the path and I had to manually adjust it and took me a lot of time. In order to solve this problem, I was reaching out for Larry who runs the machine shop, TA in robot autonomy and Matt in MRSD to find out a possible solution for that. They all provide different but valuable thoughts but I have to decide which to do and start work on it. Hence, the trade study of different methods was important to do right now.

Team work

Work	done in this week	Name
Sensor noise	Sensor noise documentation	Sid
Color calibration	Color segmentation	Mandy
Robot simulation and control	Robot simulation model	Peter
Path planning	Create camera parameter model	Cece
Visual model and image rendering	3D Mesh Model of Camera (EVT)	Sam

For the jointed work, we spend some time on the schedule and planning and there were all single person tasks in this semester besides the final experiments because we thought it would be more clear for team manager and individual to track work progress. But, it didn't mean that we will not help each other, we still had a team meeting and discussion for each member's work.

Future Plans

1. Reading operation manual(work online) / Learn to use real robot arm:

I will read the operational manual for the control the real robot(online) and work with the sponsor to practice using the real robot arm.

2. Understand the robot arm configuration and search resource to solve the problem.

As I mention in the challenge, the path generation in the RobotStudio still had some problem. Hence, I will try to understand more about this problem and then used the related resource to solve it.

