

Summary Report II

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Progress:

The recommended actions received from Chloe and Eugen during the first review meeting led the group to pursue some new ideas and helped the group move forward with a more solid plan.

Sensors

Since the last review the group has extensively tested the sensors, as recommended by the instructors. The Hall Effect sensor was tested to determine the influence of the “gripper” magnet on the sensitivity in the presence magnetic tesseracts at varying distances. It was found that the maximum distance at which the sensor returned data was approximately 1”. It was also found that approaching a tesseract from a direction perpendicular to the magnetic fields does not return a sensor reading. Based on this data the group decided not to use Hall Effect sensors as the primary tesseract locating sensor.

Line tracker testing led the group to discover that line trackers, suspended ~2.5cm above the ground, could be used to visually locate both magnetic and non-magnetic tesseracts. The change in sensor reading between tesseract/no tesseract was 100, which is approximately 10% of the analog range. After discovering this it was concluded that a so-called “proximity curtain” would be our main detection mechanism. After discovering the benefits of the line tracking sensors, the group purchased 20 IR sensors to create the curtain. These are currently in testing but show great promise.

Prototype

A preliminary prototype has been built out of wood and vex components. The main component still in development is the end effector which will be discussed further in the plan. Besides from the end effector and IR curtain, the prototype has all components that we plan to use in the final prototype.

The group collectively decided that one system to perform all tasks would be preferable to multiple systems to manipulate the tesseracts. This decision led to the conclusion that an arm would be the primary mechanism for both picking up and dropping off tesseracts. The scissor lift and elevator have been discarded.

Prognosis:

Having regular team meetings, in which the group discusses their progress on individual projects, has been invaluable. Using multiple ideas for the same piece allows us to design the most efficient and effective device possible. Given the progress made in the past weeks, the project will be finished in a timely fashion and in full working order. Although our current progress is slightly behind the original schedule, we are confident that the project will be completed on time. The variety of tasks assigned to

each group member has given everyone a chance to become more capable with the various software packages that have been used in our project. Tests on the preliminary component system prototypes have proven quite successful and lead us to believe in the success of our project.

Plan:

Moving forward with the project, our first order of business is to develop a final design of the end effector, which everyone has been working on. The proximity curtain will be put together immanently since we now have all the components needed to make it. After all the bugs are worked out of the proximity curtain, the final prototype will be built. All parts are expected to be finalized and in construction no later than March 28th. This will give us enough time to finalize the code and test the final prototype.