# 4) Devices trying to extract the plan of their surroundings

Functional requirements for this Project:

* Start signal
* Scanning the surroundings
* Change position for different scan angles
* Distinguish different objects in terms of their shape
* Create a data containing information of individual shapes and their positions
* Send created data to a remote location in one-way communication for display purposes

Constraints fort his Project as follows:

* The robot should not disrupt the playfield.
* All operation sensors must be included within the robot.
* Max height of the robot should not exceed the height of objects in field and the robot should fit in a cylinder of 25 cm diameter.

**Budget:** Money which is considered to be spent in order to develop and produce the final project.

In metrics, 5 points will be given for budget considered to be less than 100$, 8 points will be given for budget considered to be between 100$-120$, and 6 points for the budget between 120$-150$, 4 points for 150$-170$, 2 points for 170$-200$ and no points for budget 200$+.

**Fun:** Measure of how much each shareholder enjoyed from performing tasks required to complete the project.

In metrics, 2 points will be given for each shareholder who would enjoy.

**Performance:** Parameters which are considered as important. These can be investigated in three sub-categories:

**Durability:** Robots ability to preserve its structure and function against external impacts and wear down.

In metrics, 10 points for preserving its structure against the effects caused by collision to wall with a speed of 1m/s and no points for not preserving its structure against the effects of collision to the wall with a speed under 0.1m/s. The points between is distributed linearly with respect to speed.

**Consistency**: Robot’s ability to execute the same performance under different conditions (starting position, ambient lighting, ambient temperature) using the same line of commands.

In metrics, 10 points for similarity of behavior over 95%, 8 points for similarity of behavior between 85%-95%, 6 points for similarity of behavior between 755%-85%, 4 points for similarity of behavior between 65%-75%, 2 points for similarity of behavior between 55%-65% and no points for similarity of behavior under 55%.

**Power Consumption**: How long the robot would last on same battery capacity of 1750mAh.

In metrics, 10 points for operation over 2 hours, no points for operation under 20 minutes.

The points between will be distributed linearly.

**Creativity**: Measure of how many different solution approaches can be proposed.

In metrics, 2 points will be given for each proposed solution and 1 point will be given for each proposed sub-solution.