

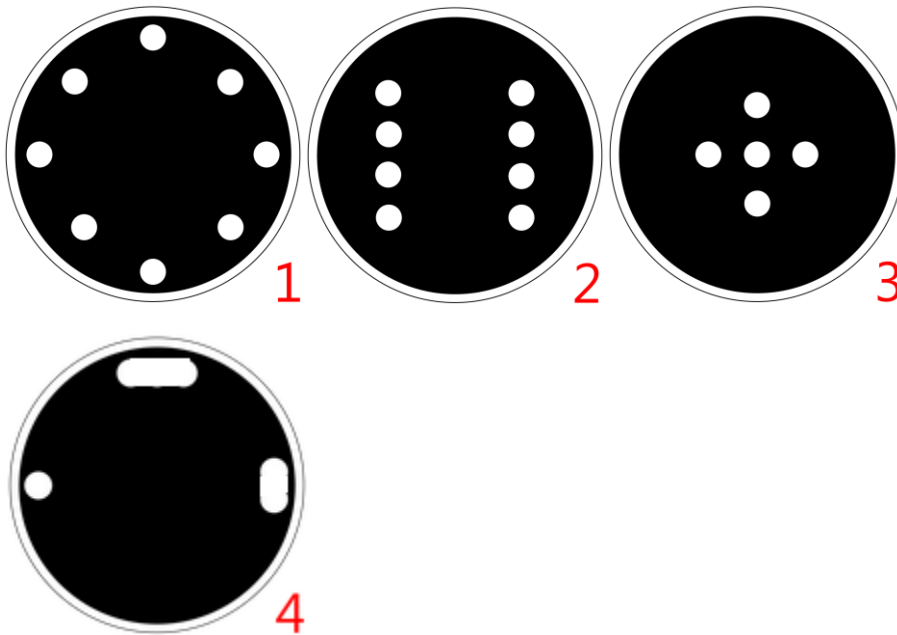
Default Project Assignment

Objective

You will program a Zumo to scan its surroundings and report the number of objects around it. You will place it in an arena with objects and white borders. It should check its surroundings and (if necessary) move around the arena. It should stay inside the arena through the process.

Design a set of experiments. Each experiment should test a different scenario: different number of objects, different angles from the center, different distances, and corner cases. While designing your experiments, consider the repeatability of the experiments. To complete this task, justify your experiments.

The below figures show examples of experiments you can set up. Notice that objects can be in any place and shape. For example, 4th experiment has three objects of different sizes. These examples are just to give you an idea. Please do not use only these examples for your experiments.



Zumo robots, batteries, charger, and track will be in laboratory 517. You can take the robots home, in order to take them you can reach the assistants of the course.

Rules and Details

- You will count the number of objects in the arena using the MZ80 infrared sensor.

- Use the LED on Zumo to show the counted number of objects (e.g., blink three times for three objects).
- You will use Zumo Reflectance Sensor Array to detect the borders.
- For each experiment, you can choose any place as your starting point.
- The blinking process should be humanly observable. We should be able to differentiate individual blinks.
- After the final led blink, your Zumo should stop moving.
- Your Zumo should stay inside the arena.
- Your robot can hit or knock over objects.
- You can use your own batteries.
- This is a group project, and taking/giving code from/to anyone except your group member is forbidden.

Submission and Reports

You must submit all files related to your project (codes, libraries you used, etc.).

You must also prepare a detailed report of the project, how you accomplished each part, your calculations, how the system works as a state machine, etc. There must also be a part that acts as a user manual. A 5-6 page report excluding the cover is ideal.

You must also prepare a 10 minute long presentation as a summary of the report.

Good Luck