T8 - IoT & Virtuality

T-DEV-811

Smart trash cans

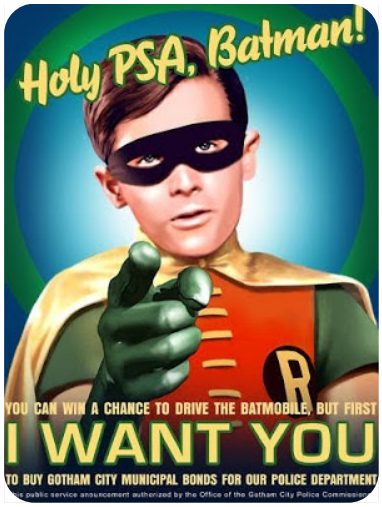
Project

1.3

Smart trash cans

delivery method: Github
language: whatever works

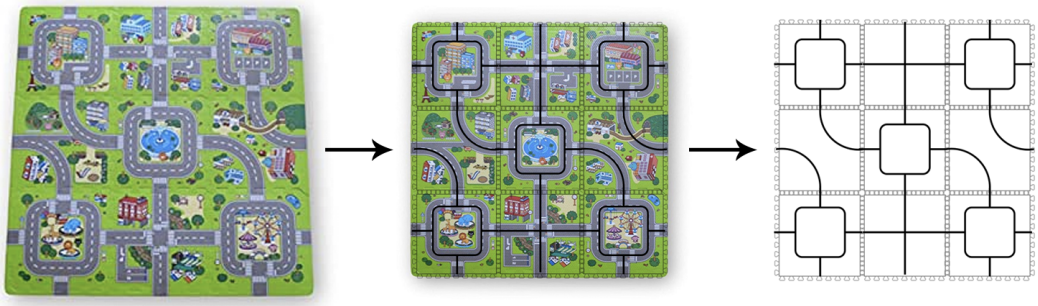
The future Mayor of Gotham City wants to start with a huge transformative project for the city: Rebuild the city waste system, true pain point for its inhabitants.



She/he is building a team of cutting edge experts to help them on this gigantic task: You !

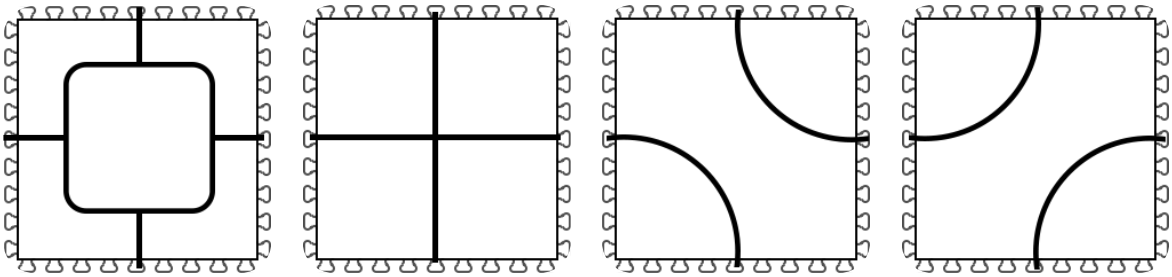
For the final defense, you'll have to present:

1. A city with roads (3 by 3 squares)



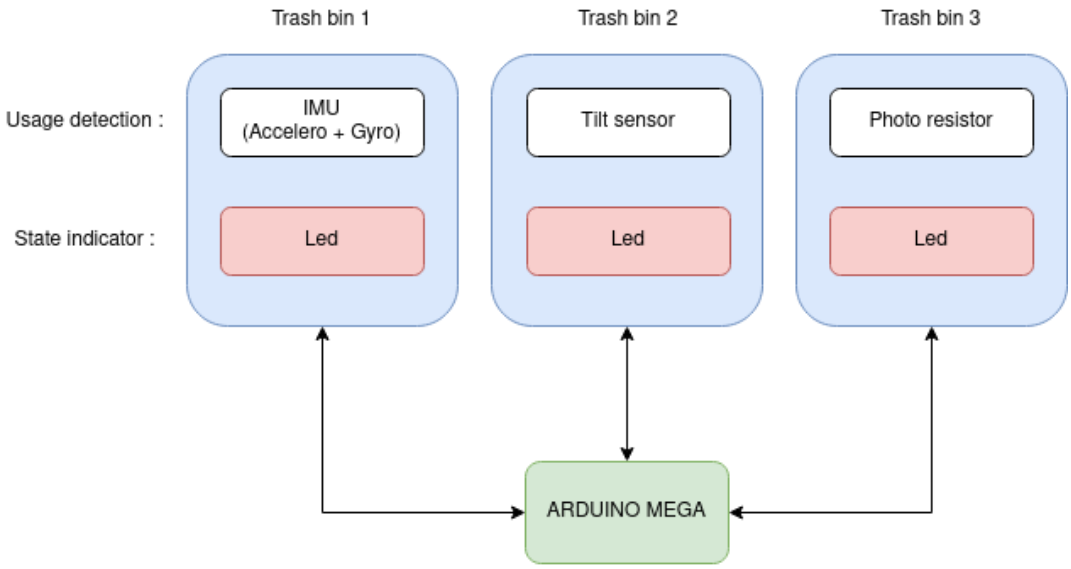
Duct tape may help you to symbolise the roads.

All squares **must have** one road going out on each side, and **must be** one of the following:



2. You must have Three (or more) trashcans (paper, 3D printing, plasticine: be creative!). Each trashcan must be able to send data to the *Arduino*, and display informations received from the *Arduino*.

3. Overall, the following must be integrated:
   - At least 3 sensors (for example : IMU, Tilt, Light, …)
   - At least 1 Actuator (for example : LED, [LCD screen], [buzzer], …)



4. Depending on how you use it, a sensor can give you different information about the trashcan : Is it open or closed? Is it tilted? Did someone touch it, meaning it would be full? Again, be creative!

5. At all times, the *Arduino* must know the state of the trashcans, depending on the integrated sensor, which must be one of the following: Empty (default), Full, Tipped.

6. When all trashcans are in a different state than the default state, you must signal the AR App to send the garbage truck. You must communicate between the arduino and the unity app, this is where the API comes in.

7. You must build an AR App on your smartphone, overlaying informations on the camera feed. You **must** at least display:

- The garbage truck's path to gather all the garbage cans (it doesn't have to be dynamic)
- A 3D model over the trashcans so they stand out on the map (use image and/or object tracking). The real-life status of the trashcan must be reflected in AR.
- A 3D model symbolising the garbage truck. When signaled by the arduino, the truck must start moving on its path to gather the trashcans.

8. For the final defense, the following will be mandatory by visio:

    - Camera streaming for IOT installation
    - Smartphone display streaming for virtuality

Try out your setup before the defense. Since we are using AR, the lighting conditions can change the experience, be sure to master every aspect of your live demo.
BONUS:
The Provided API as a lot of weakness: it is'nt scalable, not well securized and implemented with a "no-code" tool.
If you can do better, do it. **Once the other parts of the project are 100% functional**.