

# Exercises

## Student Competitions: Mobile Robotics Training



## 5. Build Your Own Path Navigation

**Reference:** Video Part 5- Path Navigation

**Task:** Design path navigation task for your robot using a path of your choice. So, get creative and design your own map!

### Steps:

Open the model `pathNavigation_customMap_start.slx`. The model contains sensor and robot simulation blocks, and the appropriate math blocks to perform a path navigation routine consisting of dead reckoning, line following, and obstacle avoidance.

1. Run the **Simulation Map Generator App** with an image of a custom track that you would like to use for this task. For example, the track could start with line following, followed by dead reckoning, and then obstacle detection. Select the appropriate parameters in the App and generate the desired map of the track. Use this new generated map (`mapForSim`) in your Simulink model.
2. Update the sensor and robot simulation blocks' parameters accordingly for the new map.
3. Build the Stateflow-based scheduler for the robot to perform the sequence of tasks similar to the demo shown in the video **Part 5: Path Navigation**.
4. Save the model as `pathNavigation_custom.slx`

### Solution

**NOTE:** Only an example of a custom map is provided here. Use this map to build the required Stateflow chart to perform path navigation.

```
>> load customTrackMap.mat
```

Map size is [2.5 2.5]

