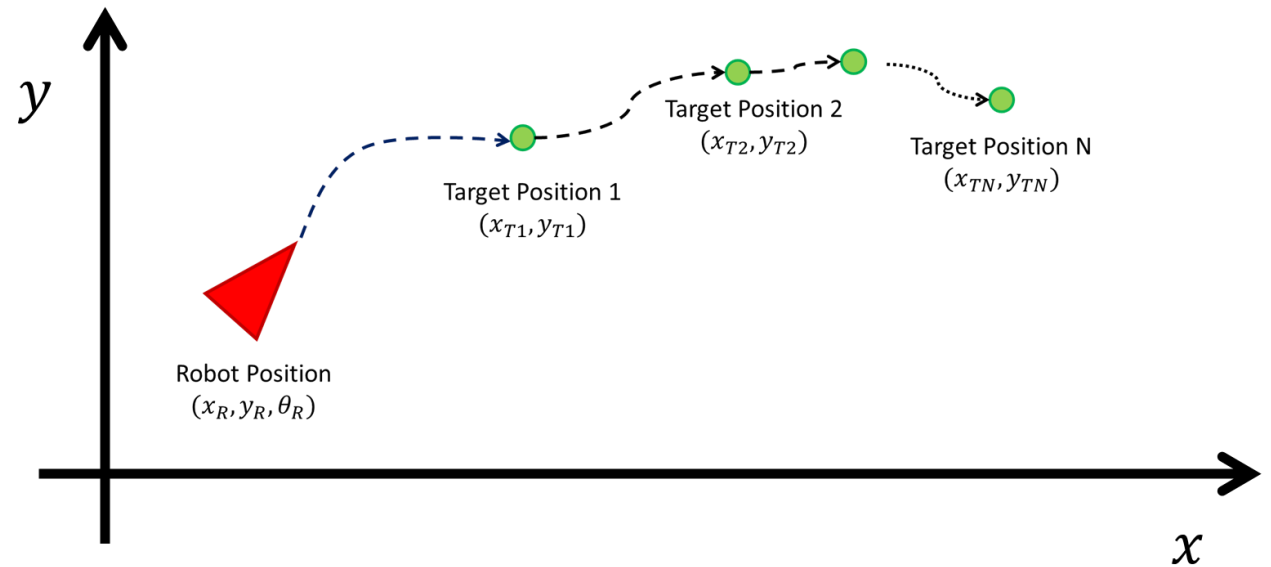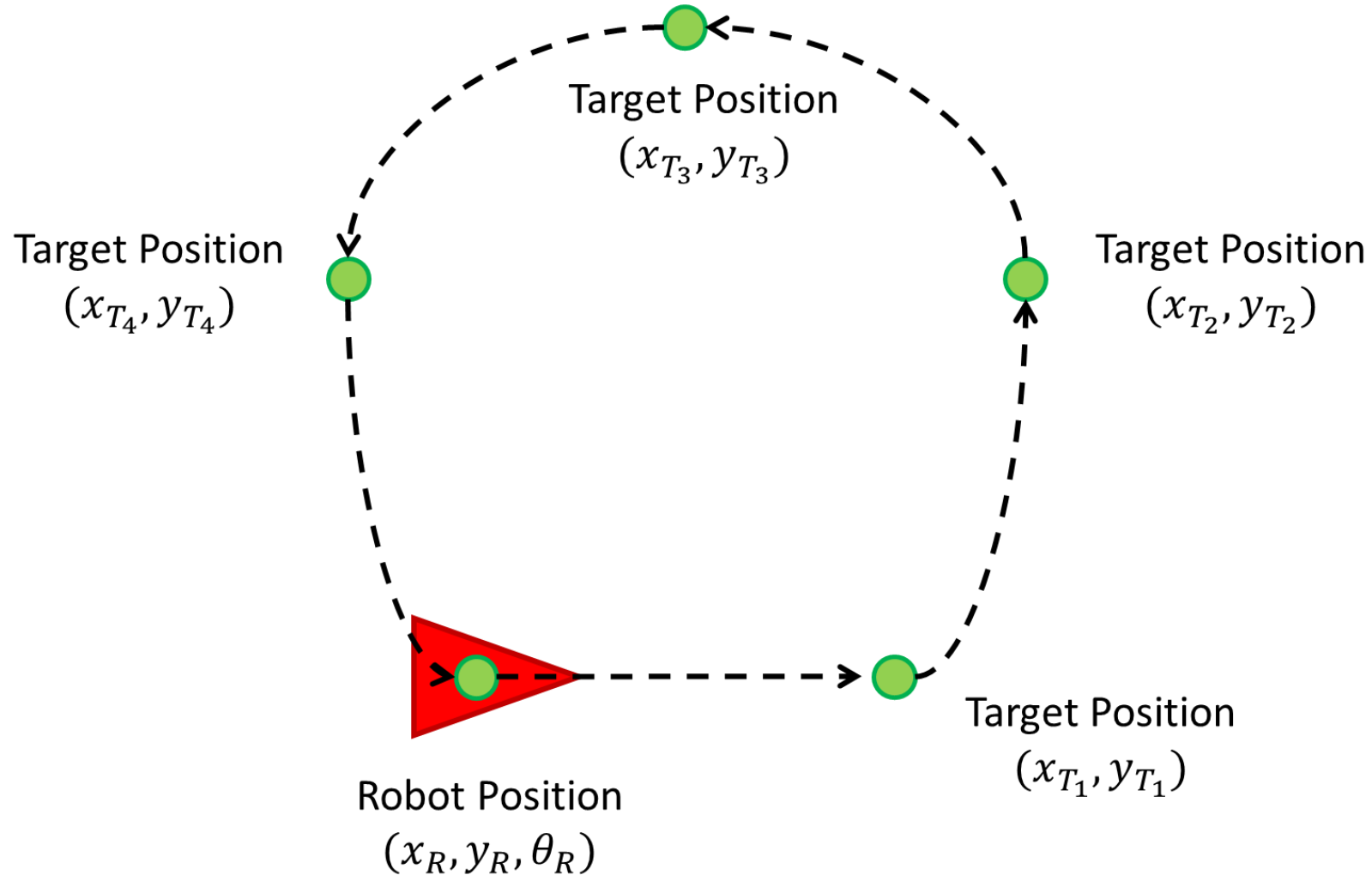Final Challenge

The Final Challenge

- The task consists of using a PID control to move the robot to different positions in the space using the Gazebo PuzzleBot Simulator.

- The number of targets x_{T_N} can be specified by each student (minimum required: 3 different positions excluding the initial position).

- The points selected by the student should resemble a geometrical shape, such as a circle, square or any other geometrical figure.

- The robot must go back to the initial position.

- The initial pose of the robot must be $[0,0,0]^T$ for $[x_r, y_r, \theta_r]^T$ respectively.

- It is encouraged, but not required, for the student to use a config file or a parameter in the launch file to establish the goal targets such that they can be changed outside the code (not hardcoded).

Example

Target Position
(x_{T_3}, y_{T_3})

Target Position
(x_{T_4}, y_{T_4})

Target Position
(x_{T_2}, y_{T_2})

Target Position
(x_{T_1}, y_{T_1})

Robot Position
(x_R, y_R, θ_R)

Rules

- This is challenge **not** a class. The students are encouraged to research, improve tune explain their algorithms by themselves.

- MCR2(Manchester Robotics) Reserves the right to answer a question if it is determined that the questions contains partially or totally an answer.

- The students are welcomed to ask only about the theoretical aspect of the classed.

- No remote control or any other form of human interaction with the simulator or ROS is allowed (except at the start when launching the files).

- The robot must always remain bounded within the MCR2 Arena in Gazebo (Square).

- The track must be solved using a closed loop control.

- It is **forbidden** to use any other internet libraires with the exception of standard libraires or NumPy.

- If in doubt about libraires please ask any teaching assistant.

- Improvements to the algorithms are encouraged and may be used as long as the students provide the reasons and a detailed explanation on the improvements.

- The student must only use the simulator and tools provided by Manchester Robotics.

- All the students must be respectful towards each other and abide by the previously defined rules.