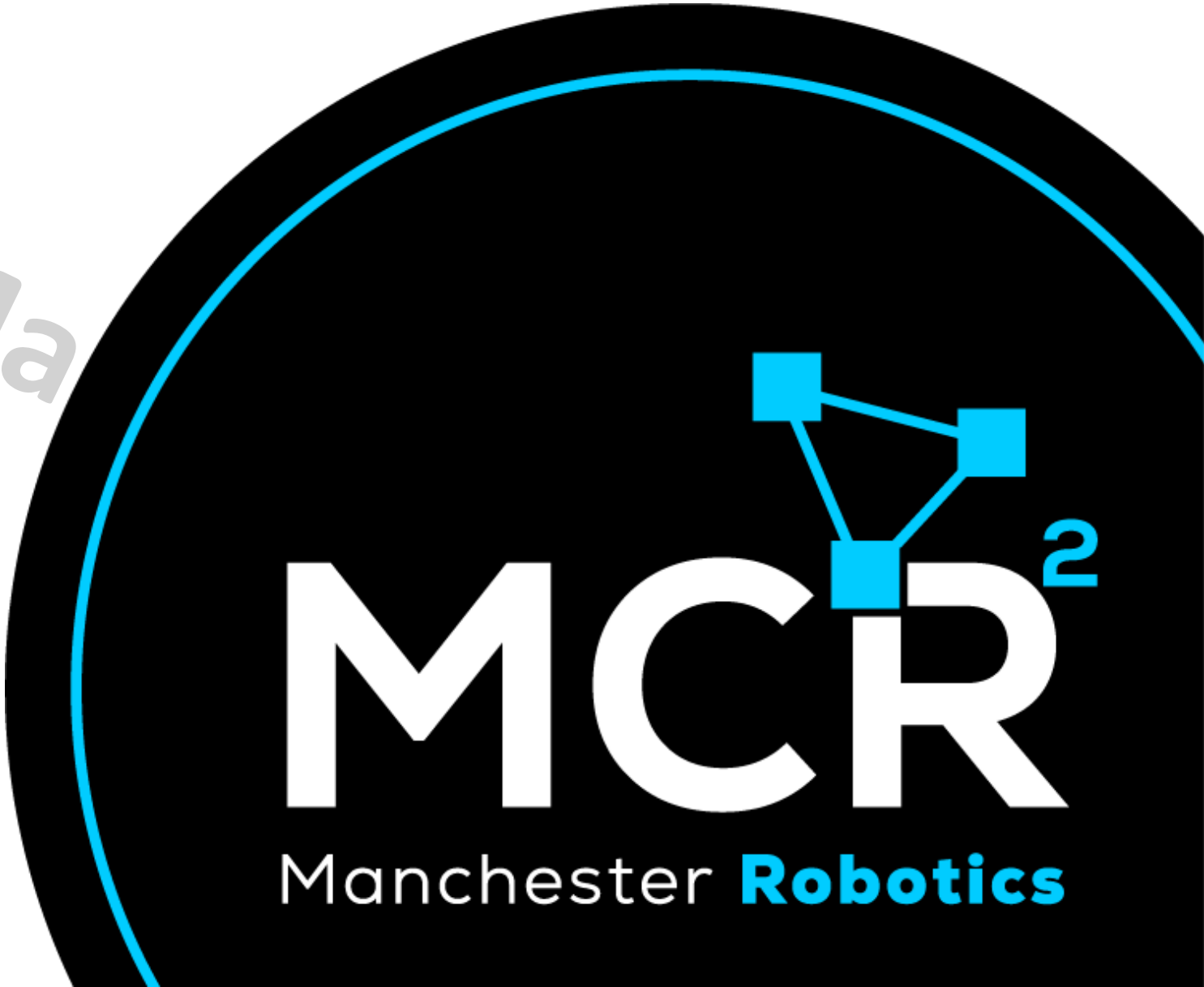
{Learn, Create, Innovate};

Challenges

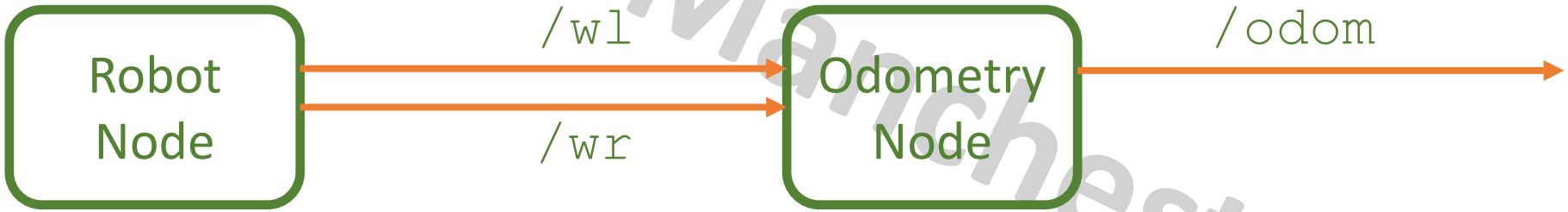
Mini challenge 2



Activity 1

- Implement a ROS node that computes the robot location using the encoder data
  - It should subscribe to `/wl` and `/wr`, and publish the data to a suitable set of topics
  - The published messages could be a Pose2D message

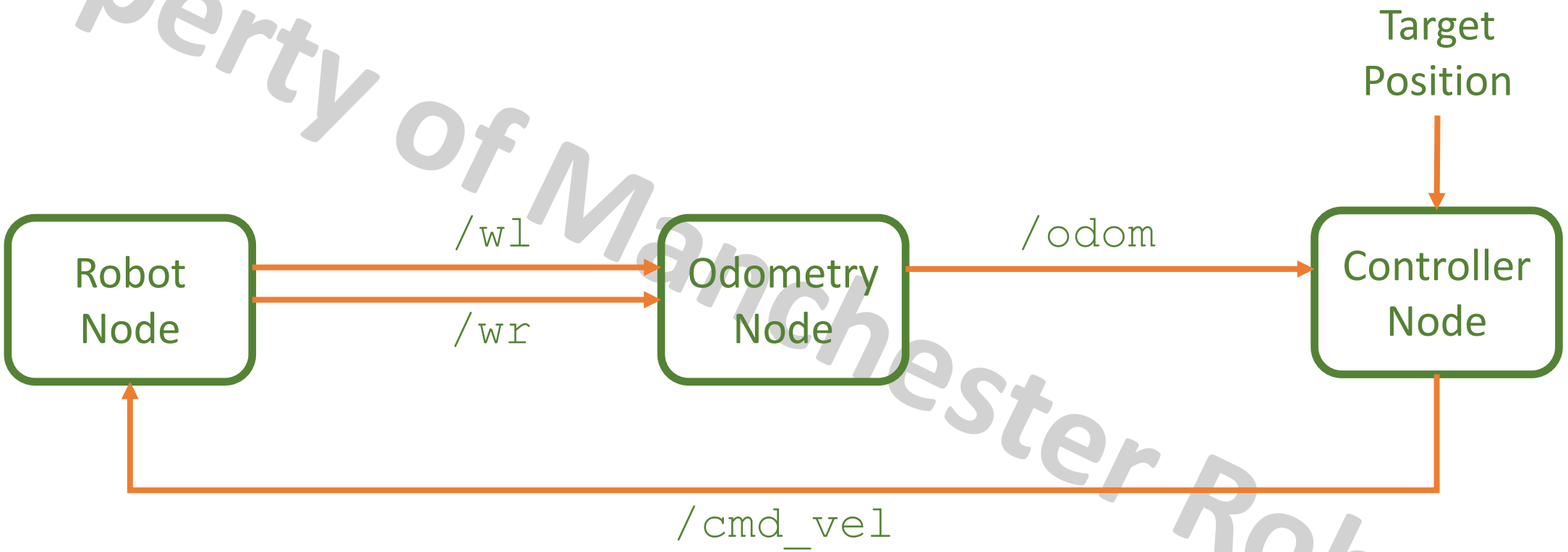
ROS Setup



Activity 2

- Modify the previous node to publish e_d and e_θ.
- Set a target, and drive the robot around, checking that the angle to the target and the distance from the target are updated correctly
- Remember to wrap all angles to within 1 circle

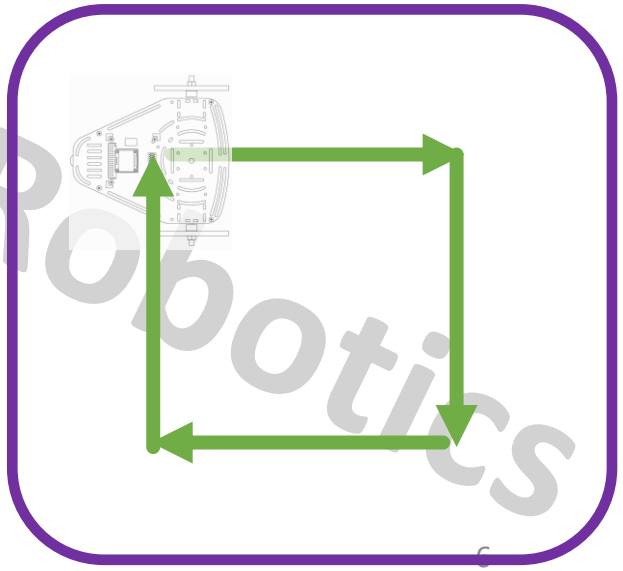
ROS Setup



Mini challenge

- Use a controller to move the robot to different positions
- The robot must follow a set of consecutive equilateral figures: triangle, square, pentagon, hexagon, …
- Each figure must be contained inside a 1m diameter circle
- The initial pose of the robot must be

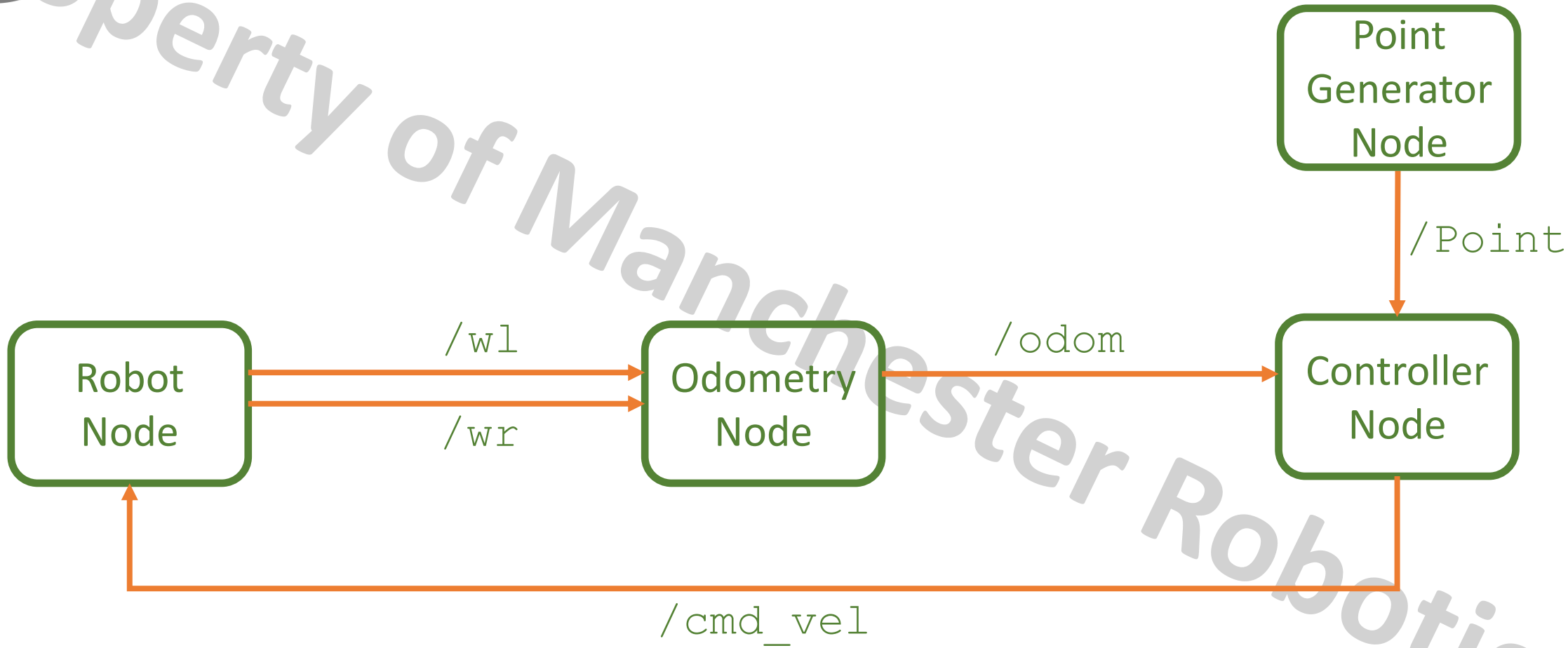
$$[x, y, \theta]^T = [0,0,0]^T$$



Mini challenge 1

- The open loop controller must be **robust.**
  - The student must define what is robustness and implement strategies to achieve it with the controller.
- The controller must be tunned using a valid methodology
- The controller must take into consideration, perturbation, nonlinearities and noise.
- It is encouraged, but not required, to use a config file and/or parameters to configure the PID, the starting, and finishing figures.

Mini challenge



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).
- 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.
- All the students must be respectful towards each other and abide by the previously defined rules.
- Manchester robotics reserves the right to provide any form of grading. Grading and grading methodology are done by the professor in charge of the unit.

Thank You

Robotics For Everyone

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T&C

Terms and conditions

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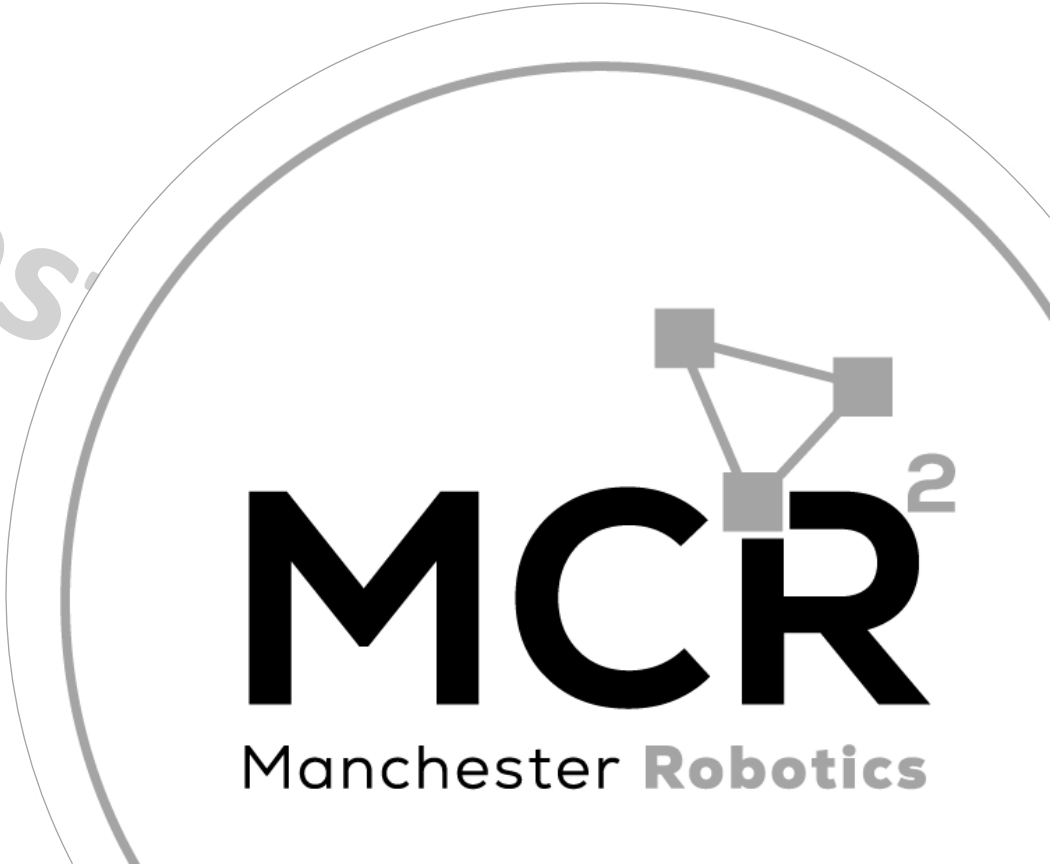

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