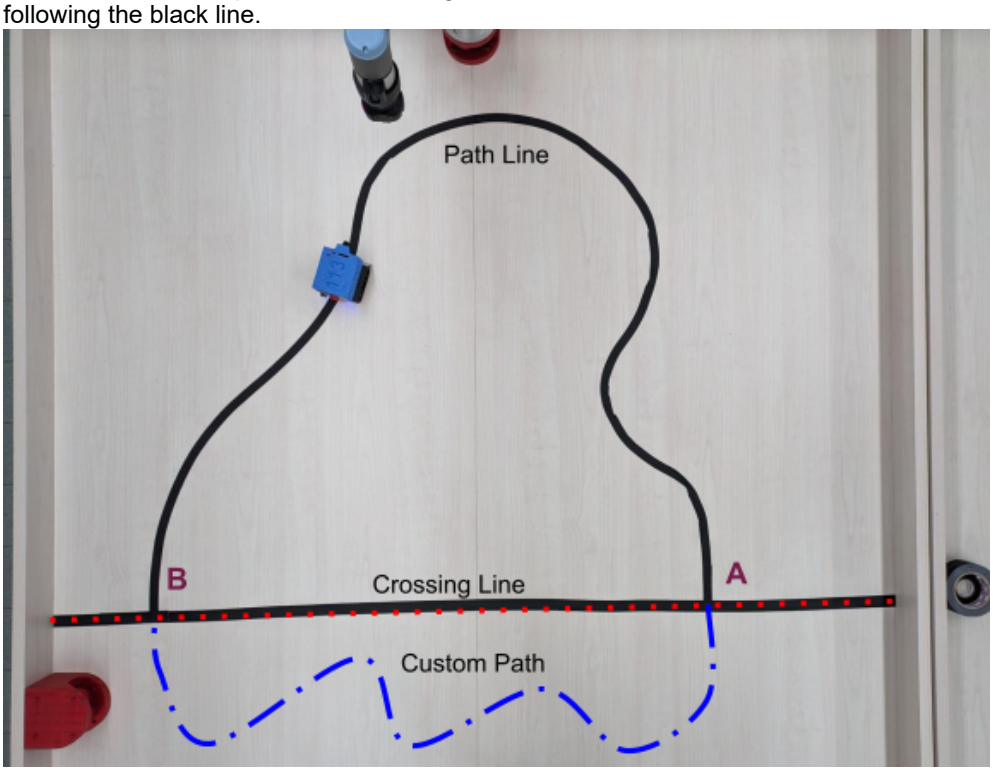
Final Project - Semester A 2023-2024

- Line Following / Path Control

Follow the black line. When reaching the crossing line turn into path control to reach from point A to point B perpendicular to the crossing line using any desired path but without crossing the line between the points and returning to following the black line.



During the experiment record and monitor the following data:

- Deviation from the desired line during line control and path control.
- Estimated position over time.
- Velocity over time.
- Control states. i.e. Line control, path control.

For the report:

- Create a block diagram of the implemented algorithm.
- Present the plots recorded from the experiments and elaborate on the various parameters used to tune the controllers and their influence on the performance.
- Bonus: youtube link for your run.
- Include the code in a zip file including all the codes from the home experiment.

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Suggested steps for a solution:

- Start by following the black line. You can start by learning how the example by Pololu works.
  File→Examples→Zumo32u4→LineFollower
- Identify when the line ends and define states to switch from following a line to path control.
- Practice path control and set the points for a path control between A to B. you can also reset the robot coordinates when switching states.
- Learn how to record robot information during experiments. Either using the arduino serial monitor or a custom python script to record the data and plot in real time. (you can use the home experiment examples for that).

Enjoy!