

Line following Dance Routine with MiniPupper

Instructor – Dr. Li Bai

Assistants – Chris Pullen, Anway Bose

1. **Dance Routines (2 Total)**

- ❖ There will be two total dance routines in the course. Both dance routines should be a minimum of 60 seconds each. After each dance routine, your pupper must follow the line to continue to the next part of the course
- ❖ The first dance routine will be triggered by a **Blue Triangle**. The second dance routine will be triggered by a **Green Square**. You can trigger the dance by the color or shape, whichever you prefer.
 - I. The first dance routine will also have a point multiplier which directly correlates to the amount of spins your robot does during the routine. Like divers on a diving board, each rotation makes it more difficult to get your pupper back on track to follow the line to the second part of the course. Each rotation/spin your pupper does during the routine will boost the points for that section by a factor of 1/10th. For example, if the pupper does 4 spins then your score will be $40\% * 1.4 = 56\%$. The maximum number of points allowed in this section is 60% or 5 successful spins. The point multiplier will only be considered if your pupper can successfully return back to the line.

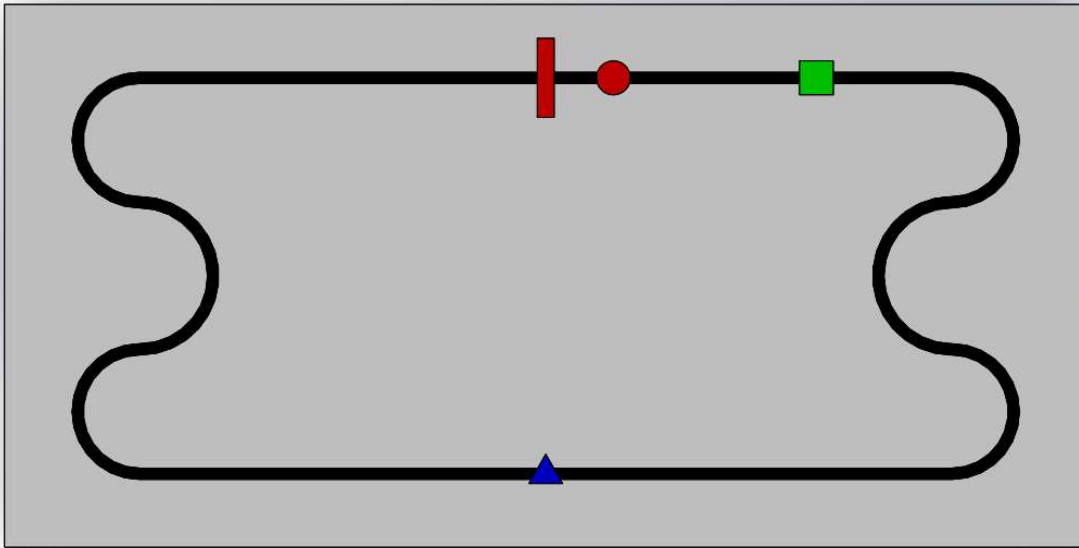
2. **Line Following**

- ❖ Similar to the first project, your pupper must follow the black line. This course will be 3D printed in black with a white tablecloth background to make it easier for your pupper to detect the line. Any human inference or assistance to move your pupper back on track will result in a 5% deduction for each assist
- ❖ There are two main sections to the line following totaling 20% of the grade. If your pupper fails to get back on course after the first dance routine, a 5% deduction will be applied to the line following section.

3. **Red Dot Finish**

- ❖ Like the first project, the end of the course will have a **RED CIRCLE** signifying the end of the course. Your pupper will need to stop at the red dot completely. If any walking, movement or otherwise occurs after seeing the red dot, a 10% deduction will be applied to the red dot section.
- ❖ You will be given a chance to demonstrate that the red dot is working if your pupper misses the dot or does not see the dot. This will result in a 10% deduction for the red dot section.

This project combines all you have learned in the previous projects. Keep in mind that speed or means of making the pupper run (WSL/ROS/Husarnet/etc) does not matter for your grade. We want you to focus on completing the course above all else. Utilize the point multiplier to gain extra points if you struggle in another category. For example, if your pupper doesn't stop at the red or can't follow the very line well, you can still get max point for doing 5 rotations. This is a **group project** which means only one pupper must complete the course. Work with your team to divide the work and create a plan to complete the course.



Dance Routine Grading Rubric		Late Submission = 2% deduction each day late		
Requirement	Full Points	Partial Points	No Points	Points Earned
Line Following 20%	Minipupper stays centered on track throughout the entire course. Pupper completes both line following sections without veering off course.	Pupper veers off course and needs to be moved back on course by human assistance (-5% per assist)	Pupper does not follow either line following section and continuously veers off course.	
Dance Routine 1 40% * multiplier (see description above)	Pupper stops at green square Pupper completes second 60 sec dance routine Pupper returns back to line following. Point multiplier will be applied if pupper does spins successfully and returns back to line following.	Pupper does not stop at blue triangle (-5%) Pupper does not dance on top of the blue triangle (-10%) Pupper does not complete a 60 seconds dance routine (-5%) Pupper does not immediate return to line following after routine (-5%)	Pupper does not complete dance routine Pupper does not stop at blue triangle Pupper not follow line Doing all three will result in no points.	
Dance Routine 2 20%	Pupper stops at green square Pupper completes second 60 sec dance routine Pupper returns back to	Pupper does not stop at green square (-5%) Pupper does not dance on top of the green square (-10%)	Pupper does not complete dance routine Pupper does not stop at blue triangle Pupper not follow line	

	line following.	<p>Pupper does not complete a 60 seconds dance routine (-5%)</p> <p>Pupper does not immediate return to line following after routine (-5%)</p>	Doing all three will result in no points	
<p>Red Dot Stopping</p> <p>20%</p>	<p>Minipupper comes to a 100% complete stop at end of course.</p> <p>Minipupper does not continue to walk or move after red dot</p>	<p>Minipupper stops but continues to walk after seeing red dot (-10%)</p> <p>Minipupper red dot does not work during run but can be demonstrated after run (-10%)</p>	<p>Red dot does not work at all during run.</p> <p>Red dot cannot be demonstrated after run completion.</p>	