# Carla Lab

## Team: Virtual Fast and Keyboard Furious

In this lab, we have implemented

1. Pure Wall Following
2. Wall following with Instructions

To run this package you will require the f110-skeletons-spring2020 package in catkin_ws.

To run pure wall following:
roslaunch virtualfastkeyboardfurious_wall_following pure_wall_following.launch

To run Wall following with Instructions:
roslaunch virtualfastkeyboardfurious_wall_following instruction_wall_following.launch

Pure Wall Following is addressed in previous Individual Assignment.

In instruction_wall_following, we make use of 5 components.

1. Finding Gaps
2. Finding the type of junction based on types of gap perceived by the robot
   i. 'T' : when there are two gaps.
   Ii. 'CROSS': crossroad type interaction when there are three gaps.
   iii 'NO_JUNCTION': Straight tube
3. Turning according to Instruction and Junction
4. Monitoring Turn initiation and completion.
5. Returning to default Instructions.

# Finding Gaps:

Similar to the previous assignment, we publish all gaps. Currently the best gap is displayed.
Parameter Changes:

1. Additionally we add gap angles to gaps message. Gap angle helps us identify which side of the robot the gap lies: left, right or in the middle ('center')
2. We also restrict maximum range-10m to find gaps within robot's vicinity and not far away
3. Currently the best gap is displayed by RViz.

# Finding Type of Junction:

Here, gaps length and gap angle help identify if there is no junction or ‘T’ or ‘Cross’ junction. Based on that we initiate the instruction following procedure.
Parameter Explanation:

1. First we check that the gap from list of gaps are within bounds of max and min gap_size and
2.