# SC 627 Assignment 3 Instructions

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## Reference

"Motion Planning in Dynamic Environments using Velocity Obstacles" by Fiorini, et. al (Find a copy in MS Teams under General > Files > Reference Books)

## Problem Statement

Plan and execute a trajectory to goal location in a dynamic environment using velocity obstacles method.

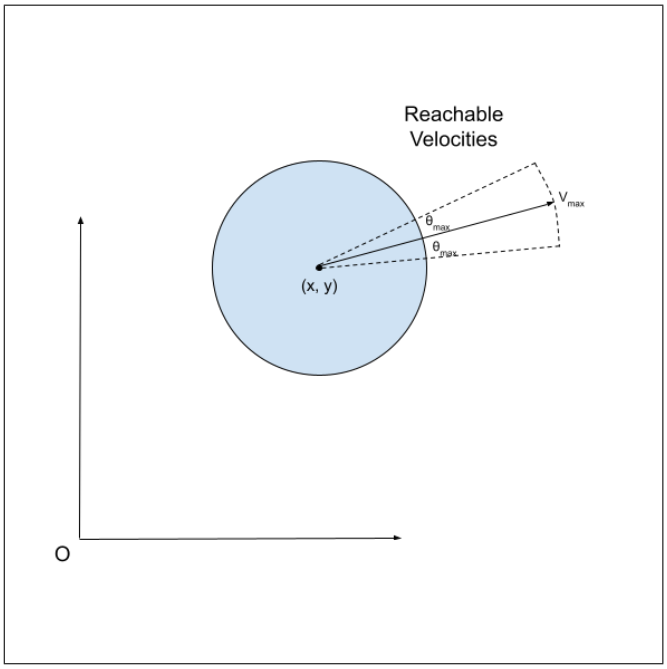


Figure 1: Reachable Velocities ($V_{max}$ is shown towards the current robot heading)

- Environment and Robot Definition
  - Start = $(0, 0)$, Goal = $(5, 0)$
  - Robot and Obstacle Diameters, $D = 0.15$
  - Magnitude of Maximum Robot Velocity $V_{max} = 0.15m/s$
  - Maximum Deviation in Orientation $\theta_{max} = 10^{\circ}$
- At each instance, the obstacle data is available containing the pose $(x_i, y_i)$ as well as velocities $(V_{x_i}, V_{y_i})$ of each obstacle $i$ w.r.t to the fixed (global) frame of reference (Elaborated in Implementation Section)
- At each instance (as frequently as possible) command a velocity vector $(V_x, V_y)$ that is outside the instantaneous velocity obstacle. You are free to use either TG, MV or ST strategy (check reference).
- Plot the robot's path and elaborate your work in the form of a report.

# Requirements

To be added soon!
*Implementation To be added soon!

# Submission

- Submission Deadline: $\mathbf{10^{th}}$ *April*, 2022 (For both Assignments 3 and 4)
- After creating the 'assignment_3' folder as described above run the following commands from the terminal
  - cd path_to_catkin_ws/src/sc627_assignments
  - git add .
  - git commit -m "assignment3_final"
    Assign this message only to the final version of your submission
  - git push -u origin master
    Verify that the folder is added to your github repository (online)
  - git log -pretty=oneline
    Copy the first string (the long one!) to the spreadsheet against your name under the appropriate column (`https://docs.google.com/spreadsheets/d/1bZN23JUzaHuUMvjP4L_9tu9Io85-VPG4_kNK7A25fTY/edit?usp=sharing`)