Amir Iqbal **Package: rogerleo_odom_hw6**
Homework: 6 **Tag: hw6**

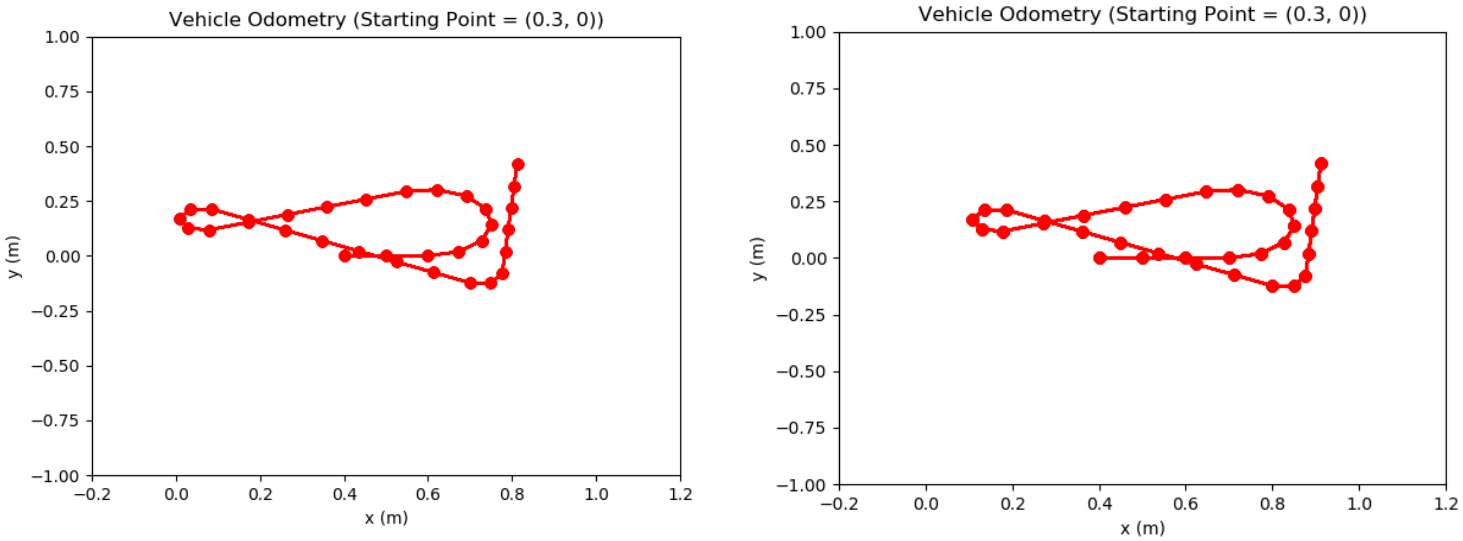
The odometry code: *In the call back function*

```
def ticks_cb(self, msg):
    l = msg.x
    r = msg.y
    delta_theta = 0.0
    ….
```

I added lines in blue. Each line is explained with a comment

```
    dist_bw_wheel = 0.1 #given in the assignment (=2L)
    del_s = (l+r)/2  #Calculate change in arc length
    del_th = (r-l)/dist_bw_wheel #Change in angle (delta_theta)
    del_x = del_s*cos(self.theta + del_th/2) #Change in x-position of the vehicle calculated based on csv data (or sensor reading)
    del_y = del_s*sin(self.theta + del_th/2) #Change in y-position of the vehicle calculated based on csv data (or sensor reading)
    self.theta += del_th #Updated yaw angle (theta = theta +delta_theta
    self.x += del_x #Updated x-position of the vehicle
    self.y += del_y #Updated y-position of the vehicle
```

Apart from writing odometry code, I also changed starting point in self initialization definition (self.x = 0.30, self.y = 0.0) and x-axis limit to -0.2 - 1.2 in the plot (plt.axis([-0.20,1.2,-1,1])). After launching ros nodes from my package (rogerleo_odom_hw6) I get the flowing plot as output.



llustration : Odometry estimate for same data set (different trails)

I also noticed that launching the nodes multiple times results in slight shift in the estimated position in the world frame. However, the pattern is essentially same and repeatable. The shift may be due to estimation error.