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Script for 2011 ME227 HW 3 Problem 2

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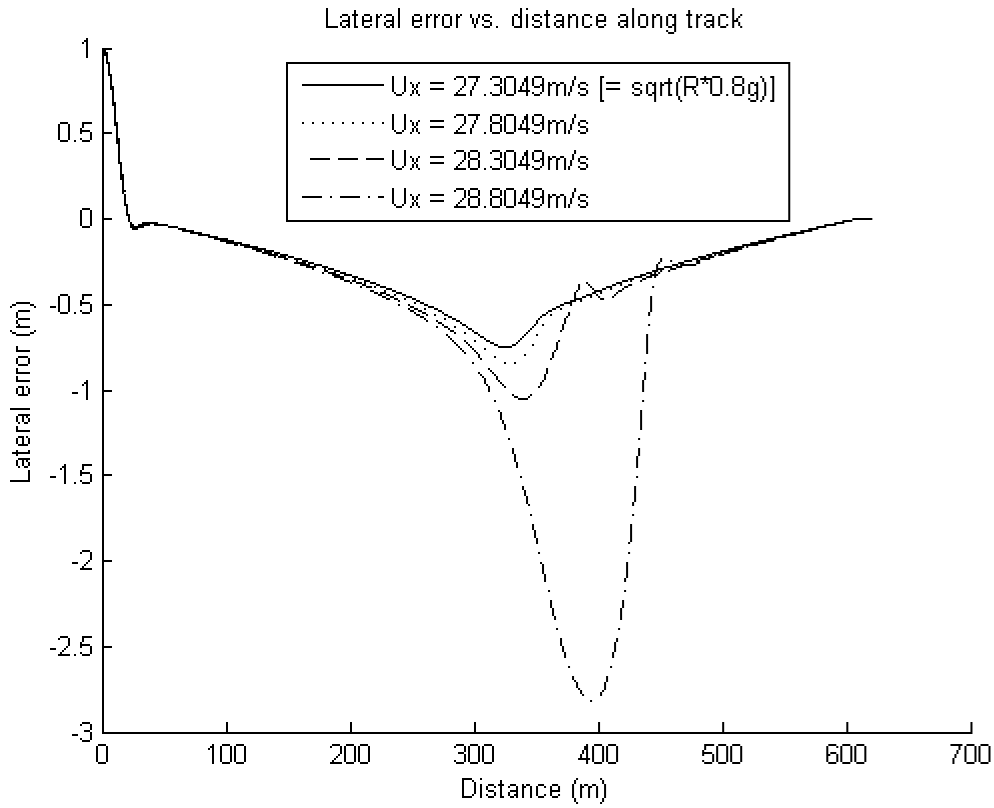
2(a) Lateral error vs. Distance along path

The cornering speed that generates 0.8g lateral acceleration is sqrt(R*0.8g). The lateral error doesn't go to zero because our control law isn't as effective away from the linear region (when we corner at 0.8g). During cornering, nonlinear tire force effects invalidate the linear system assumptions of our control law.

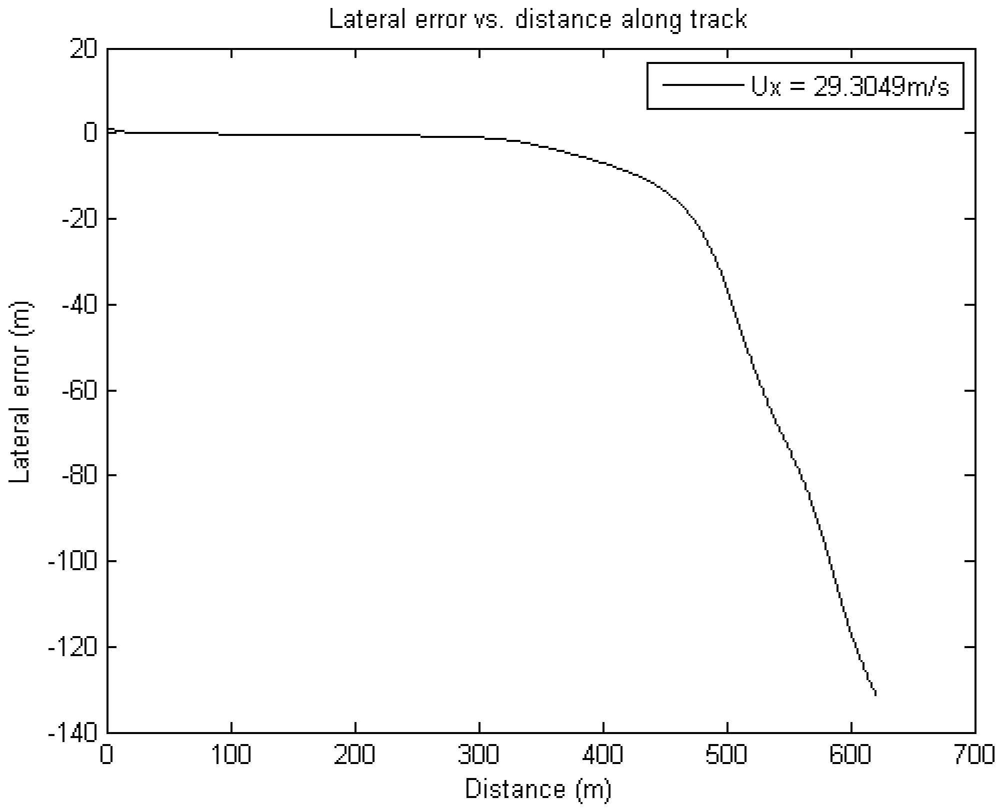
```
simulation =

    tmodel: 'fiala'
    vmodel: 'fourwheel'
         g: 9.8100
     speed: 27.3049
```

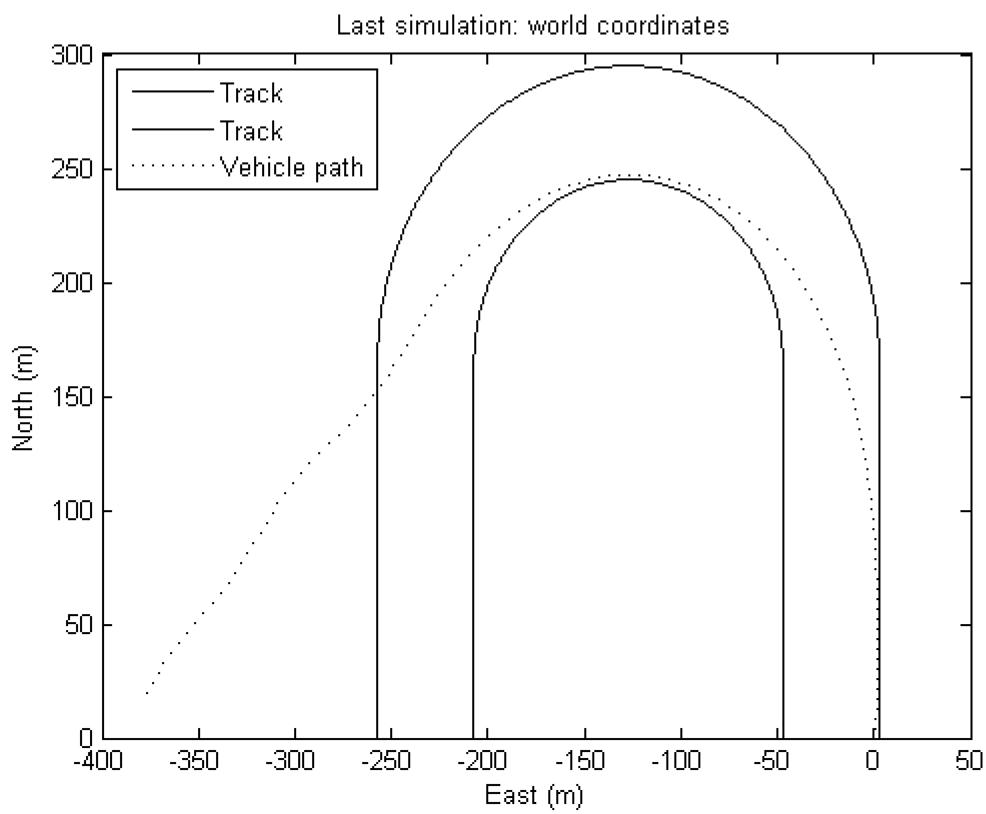


2(b) Lateral error vs. Distance along path (e > 3)

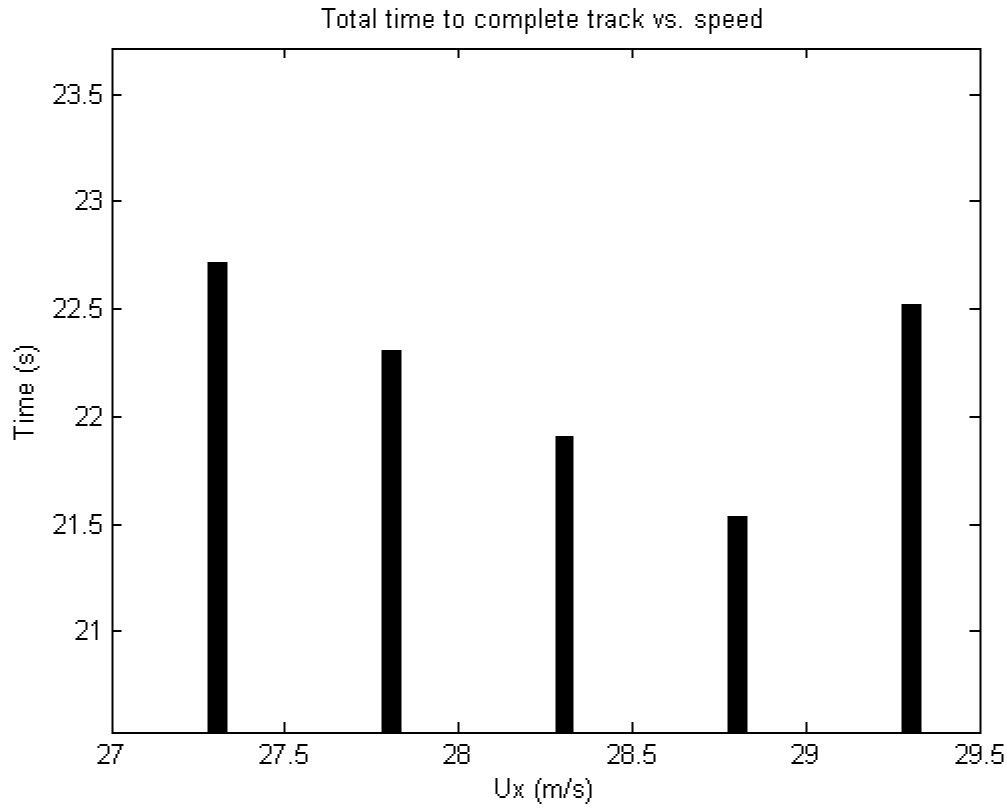
In our last simulation, the car goes off the path and our control law is no longer able to stabilize it. As speed increases, our previous plot showed that the lateral error increased as well. Our total time to run the track decreased as speed increased as long as we stayed on the track.



Lateral error vs. distance along track
Ux = 29.3049m/s
Lateral error (m)
Distance (m)
20
0
-20
-40
-60
-80
-100
-120
-140
0
100
200
300
400
500
600
700



Last simulation: world coordinates
Track
Track
Vehicle path
North (m)
East (m)
300
250
200
150
100
50
0
-400
-350
-300
-250
-200
-150
-100
-50
0
50



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