

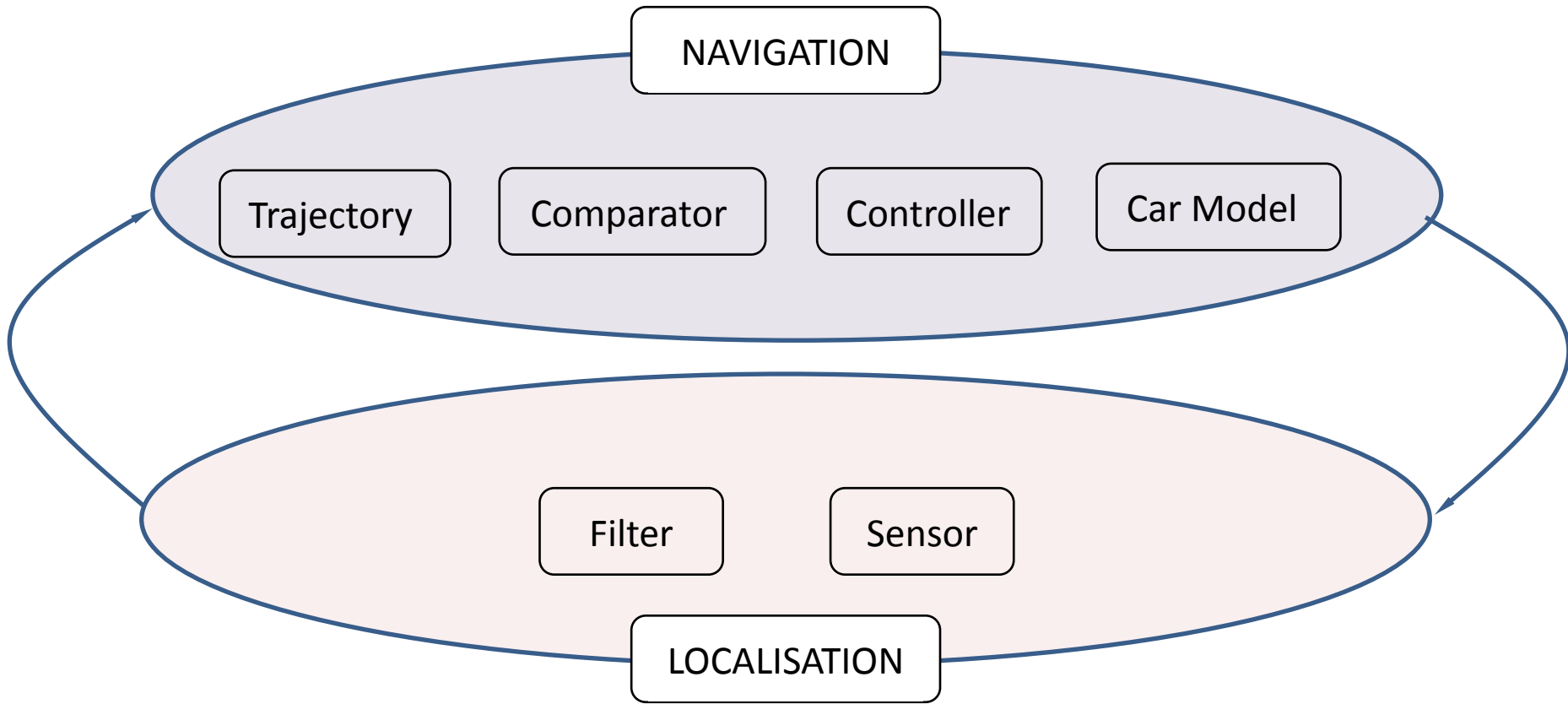
# **Obtaining the comparator and the controller gains**

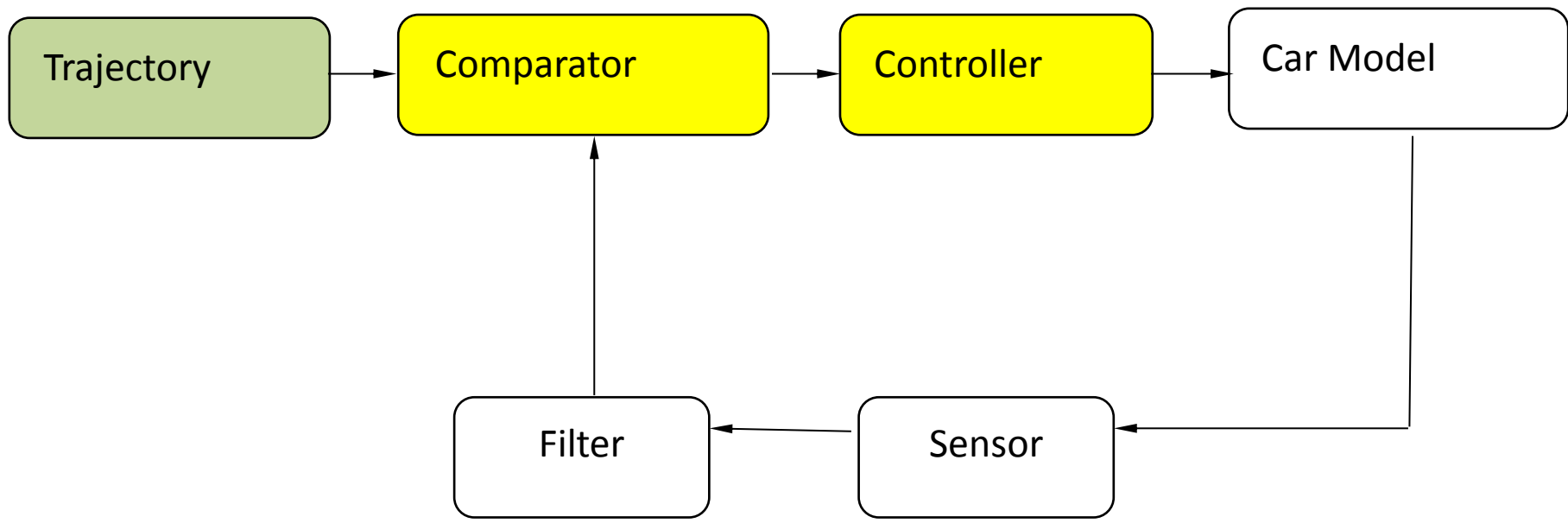
The second and third block of the  
Mobile Robot Simulator

# Agenda

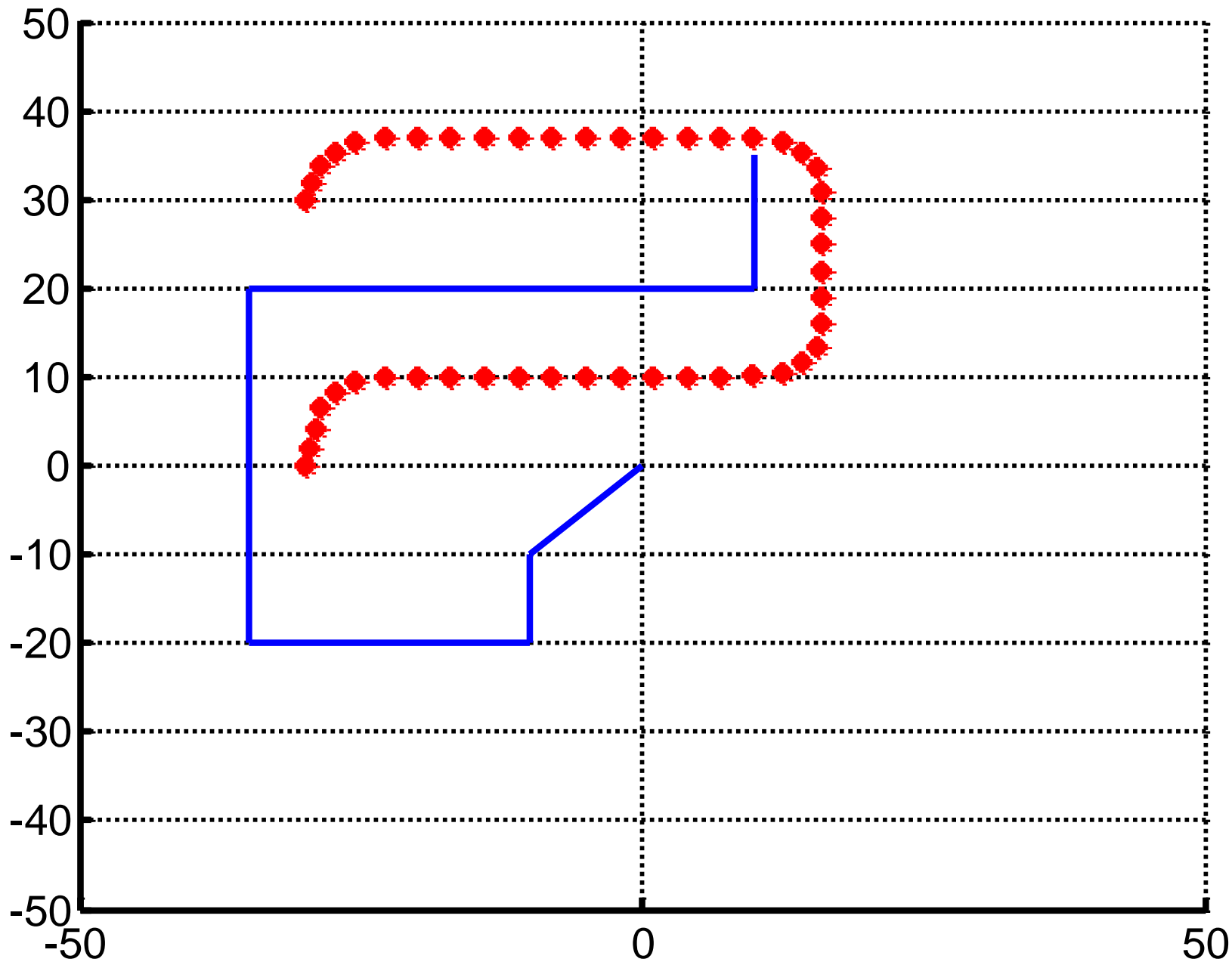
- The big picture
- The Comparator design
- The PID controller design
- Examples

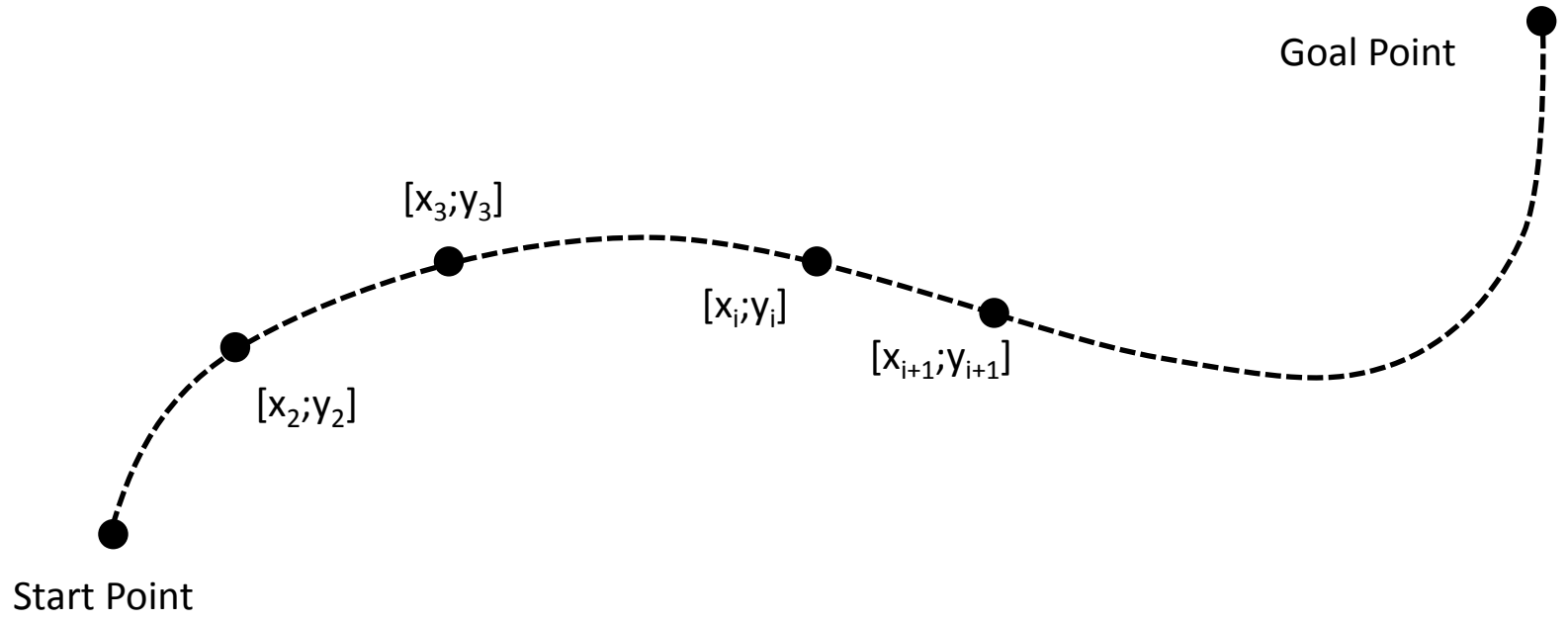
# **THE BIG PICTURE**



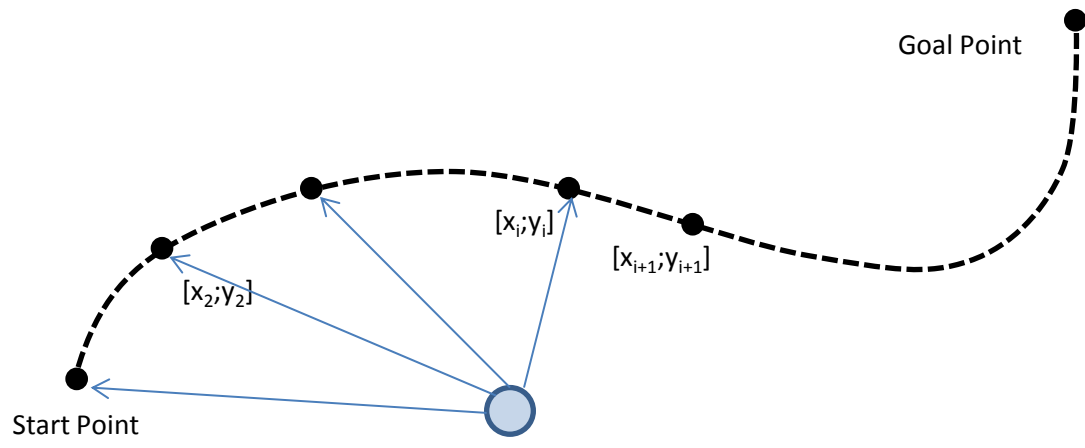


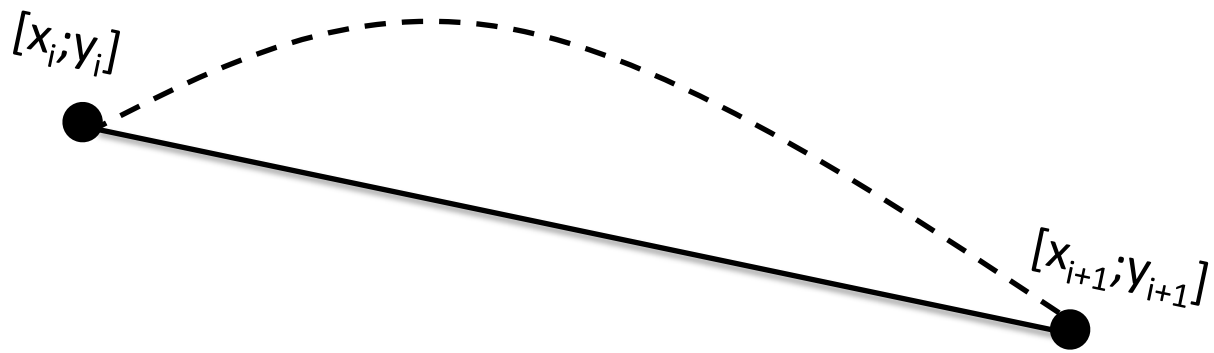
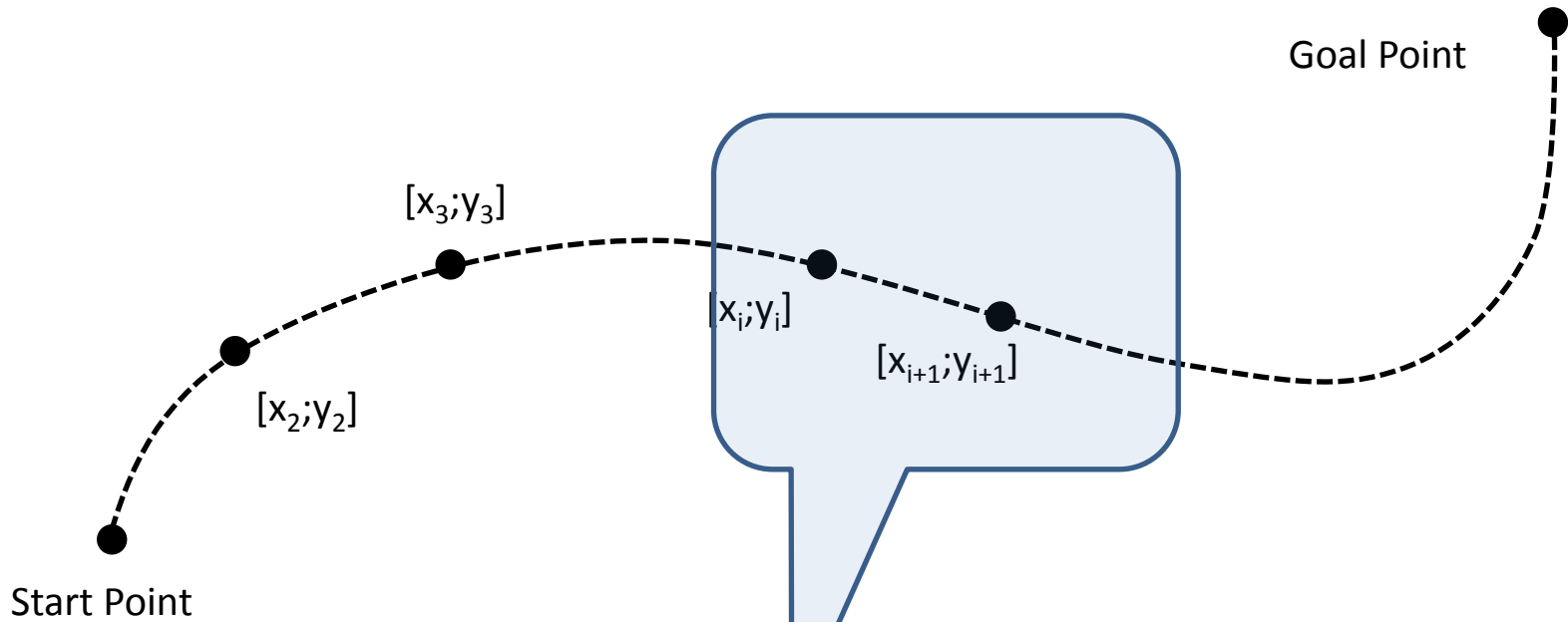
# **THE COMPARATOR DESIGN**

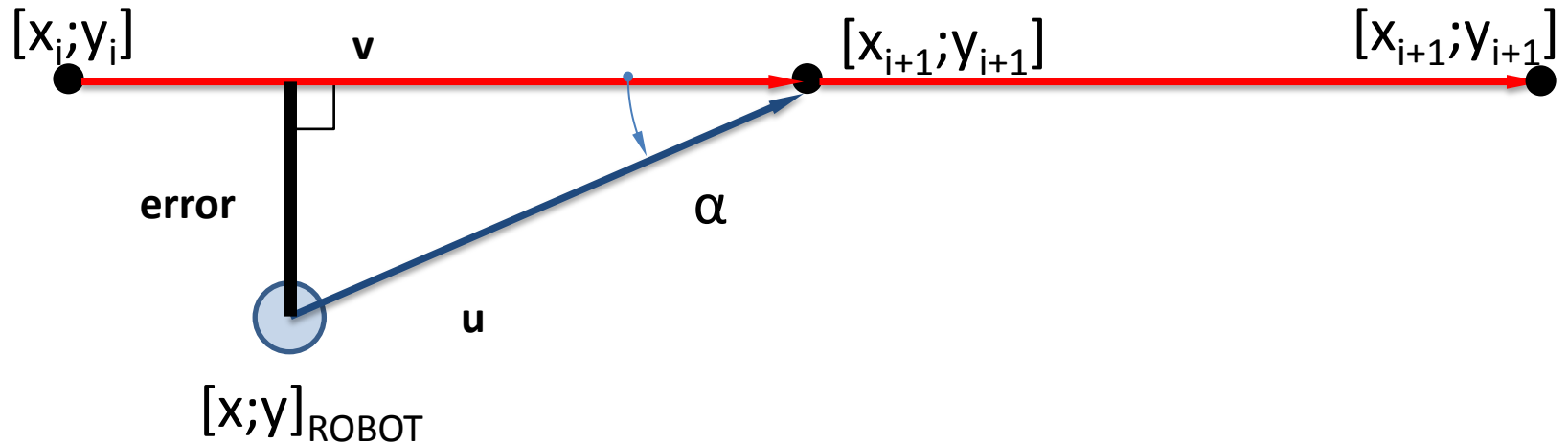








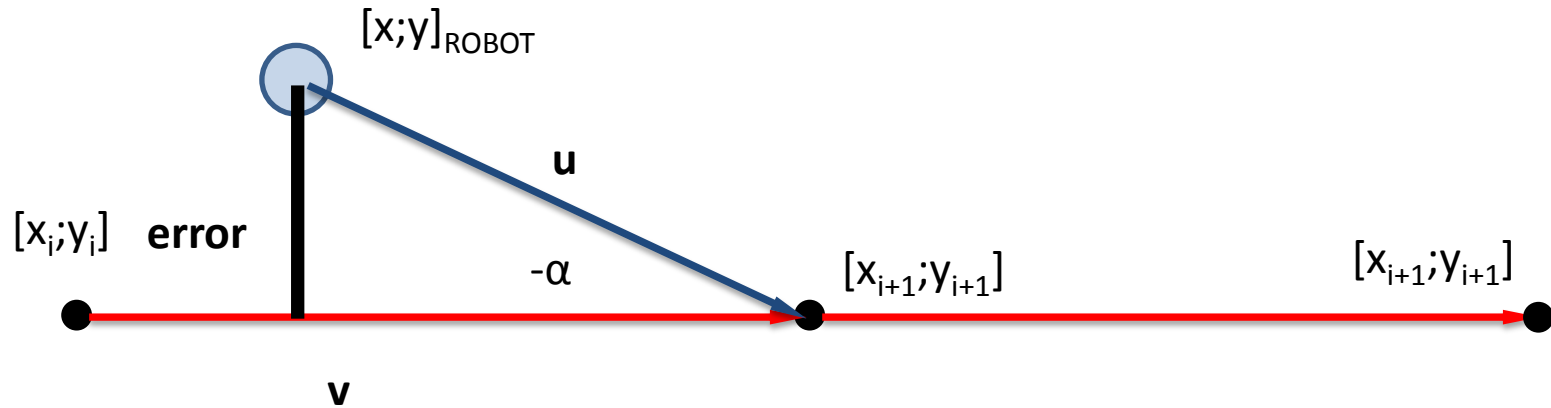




```

w=cross([u;0]','[v;0]');
semn=sign(w(1,3));
error=semn*(norm(u)^2-norm(u)/norm(v)*(u'*v))

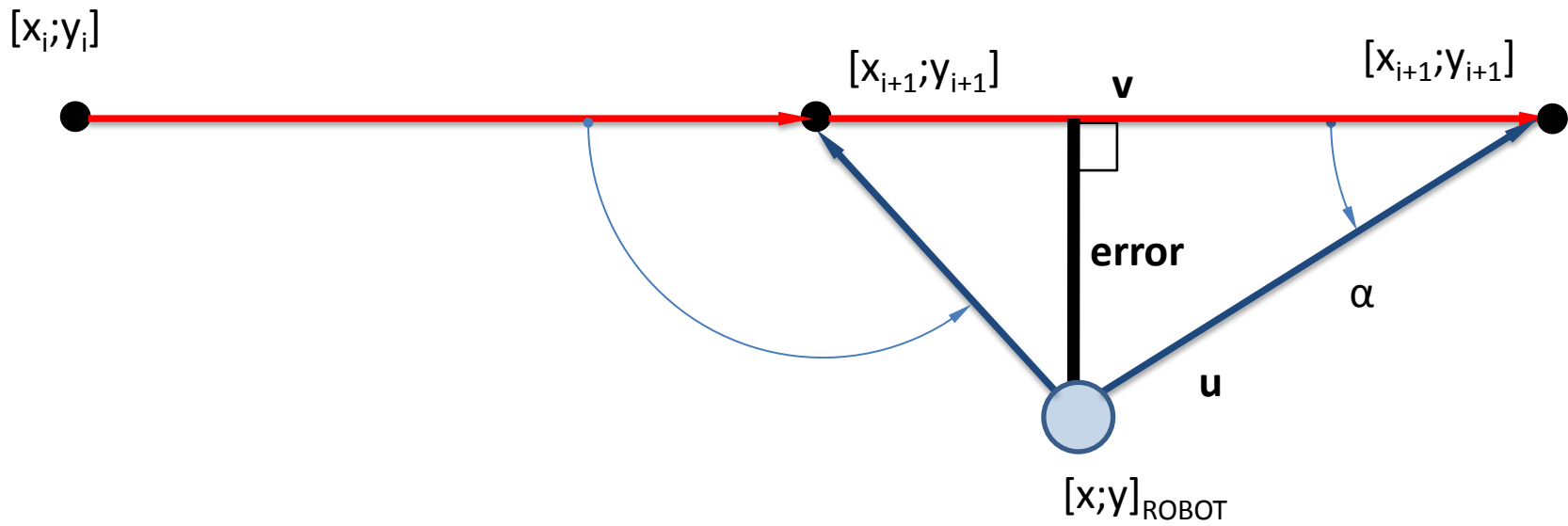
```



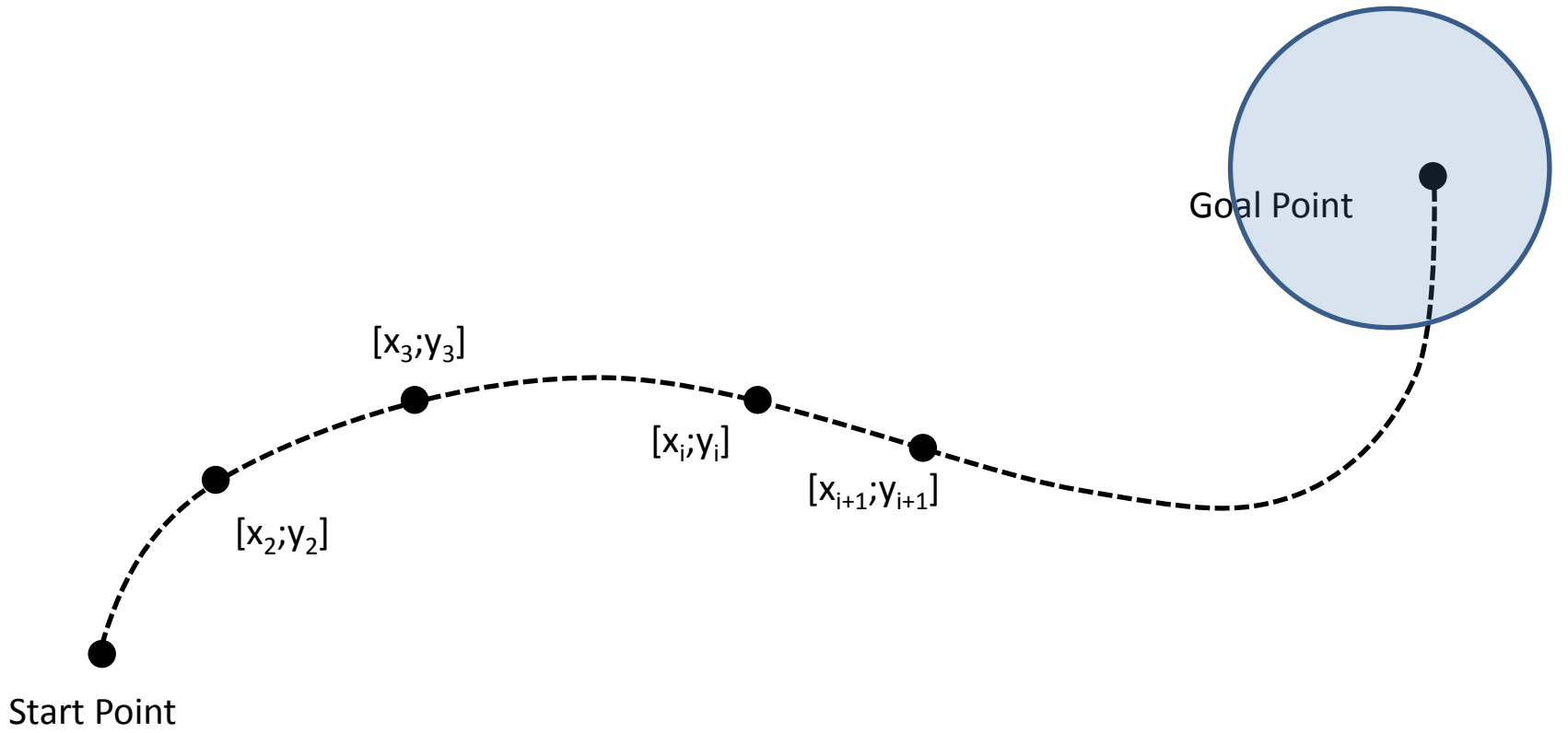
```

w=cross([u;0]',[v;0]');
semn=sign(w(1,3));
error=semn*(norm(u)^2-norm(u)/norm(v)*(u'*v))

```



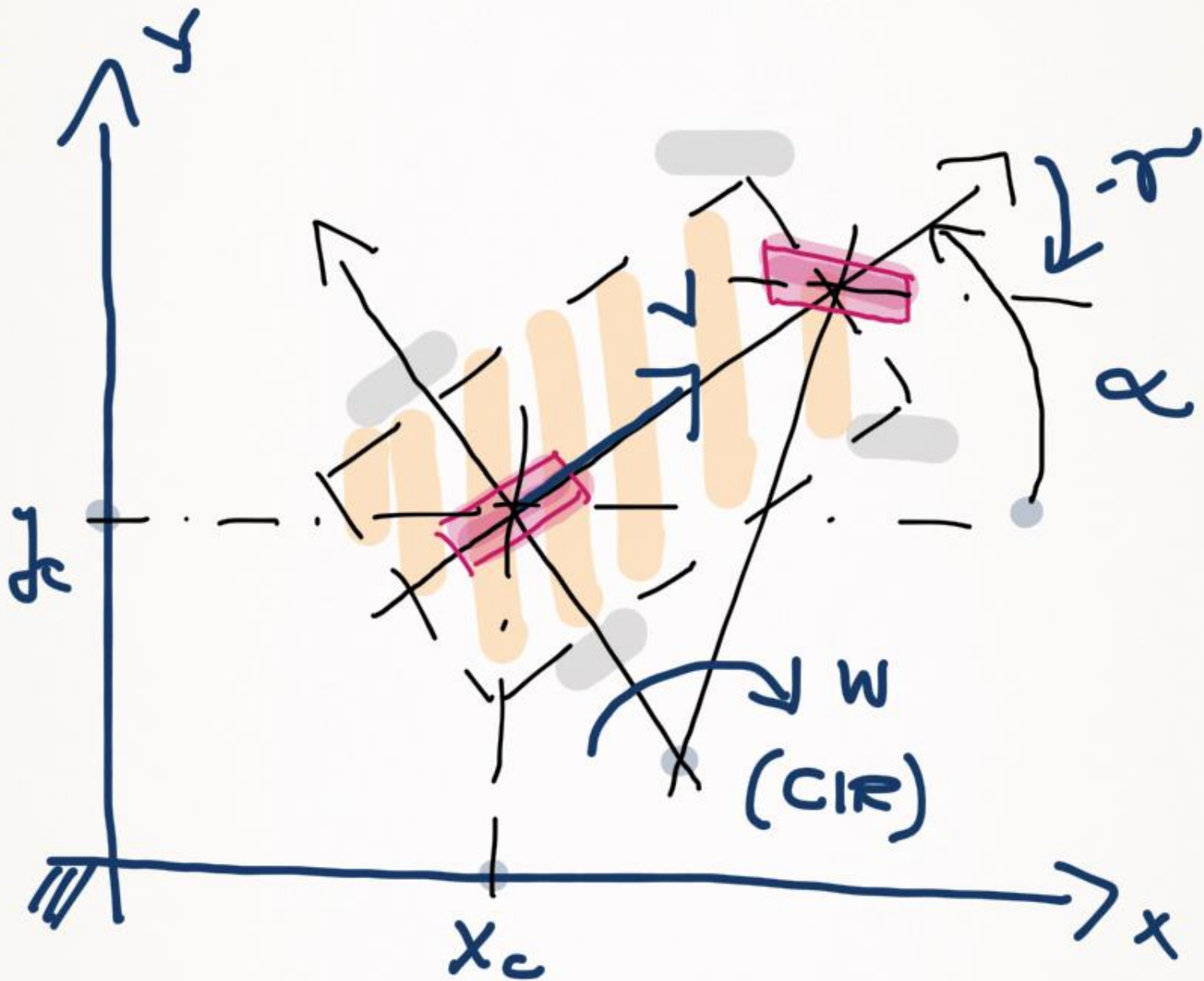
$$(\text{norm}(\mathbf{v}))^2 - \text{error} > (\mathbf{u}' * \mathbf{v})$$

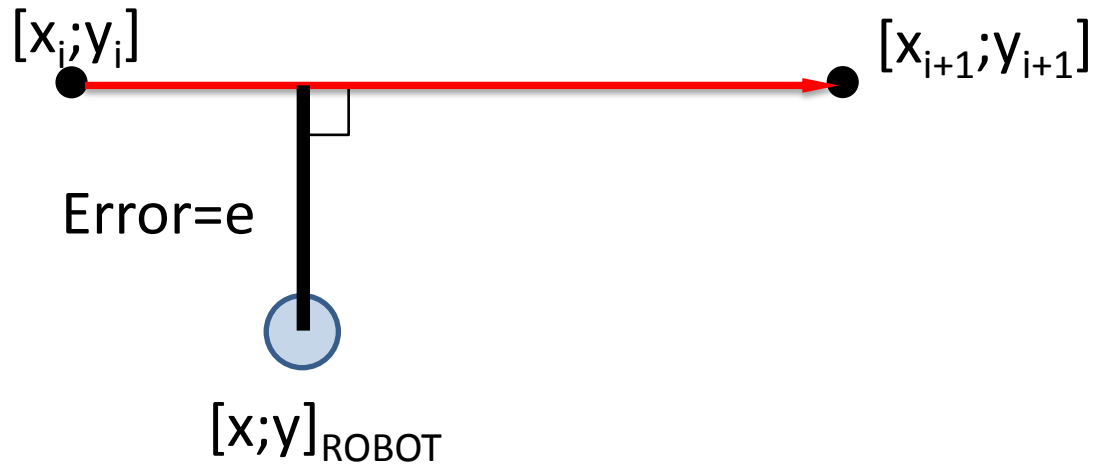


# **PID CONTROLLER DESIGN BY TWIDDLE METHOD**

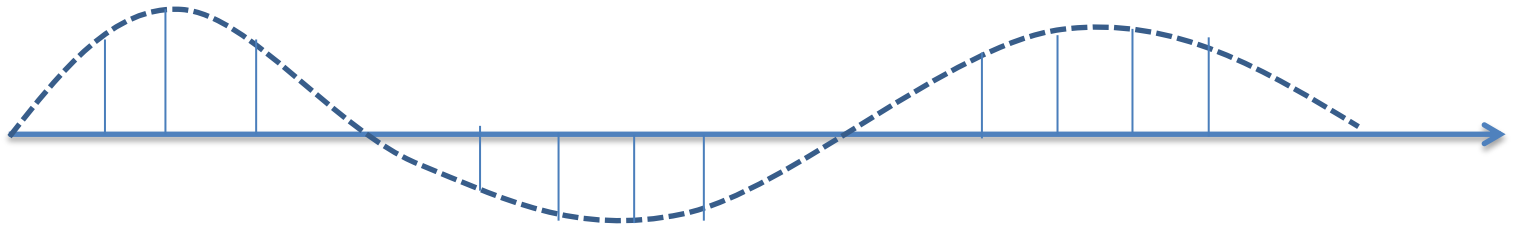
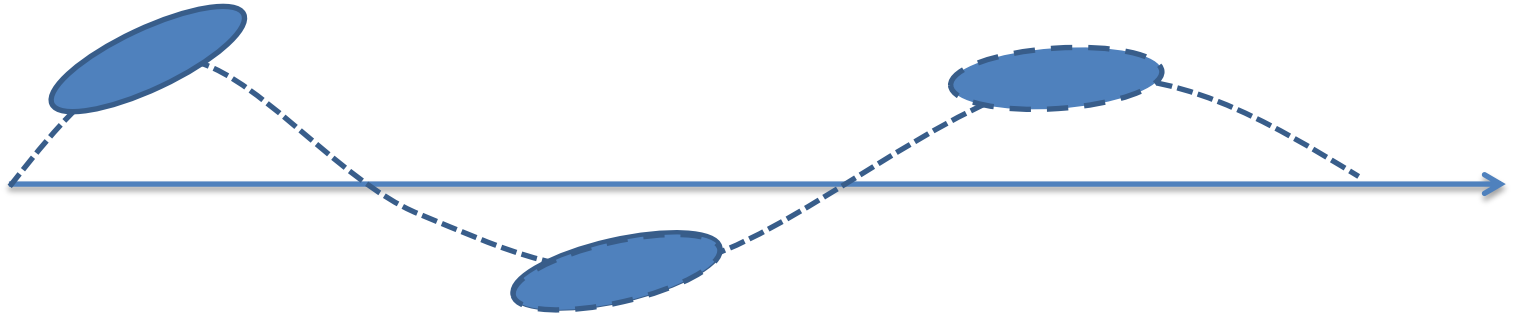


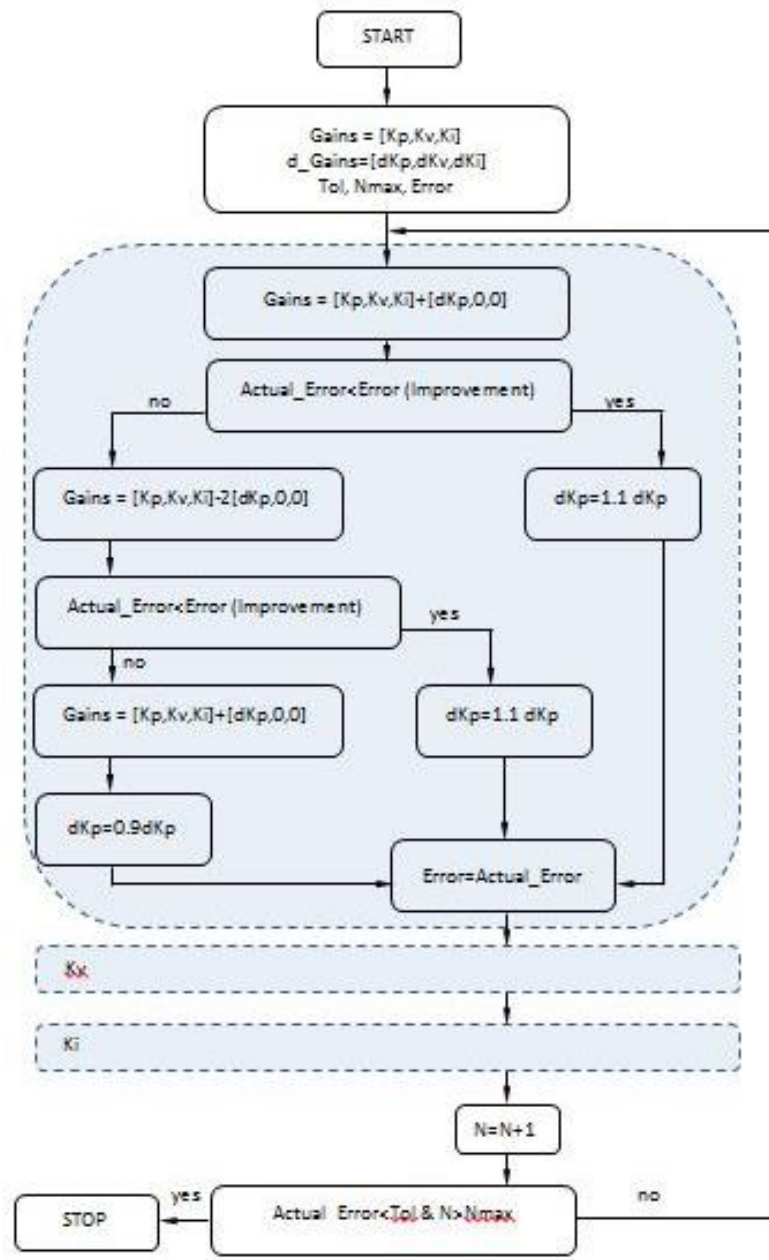






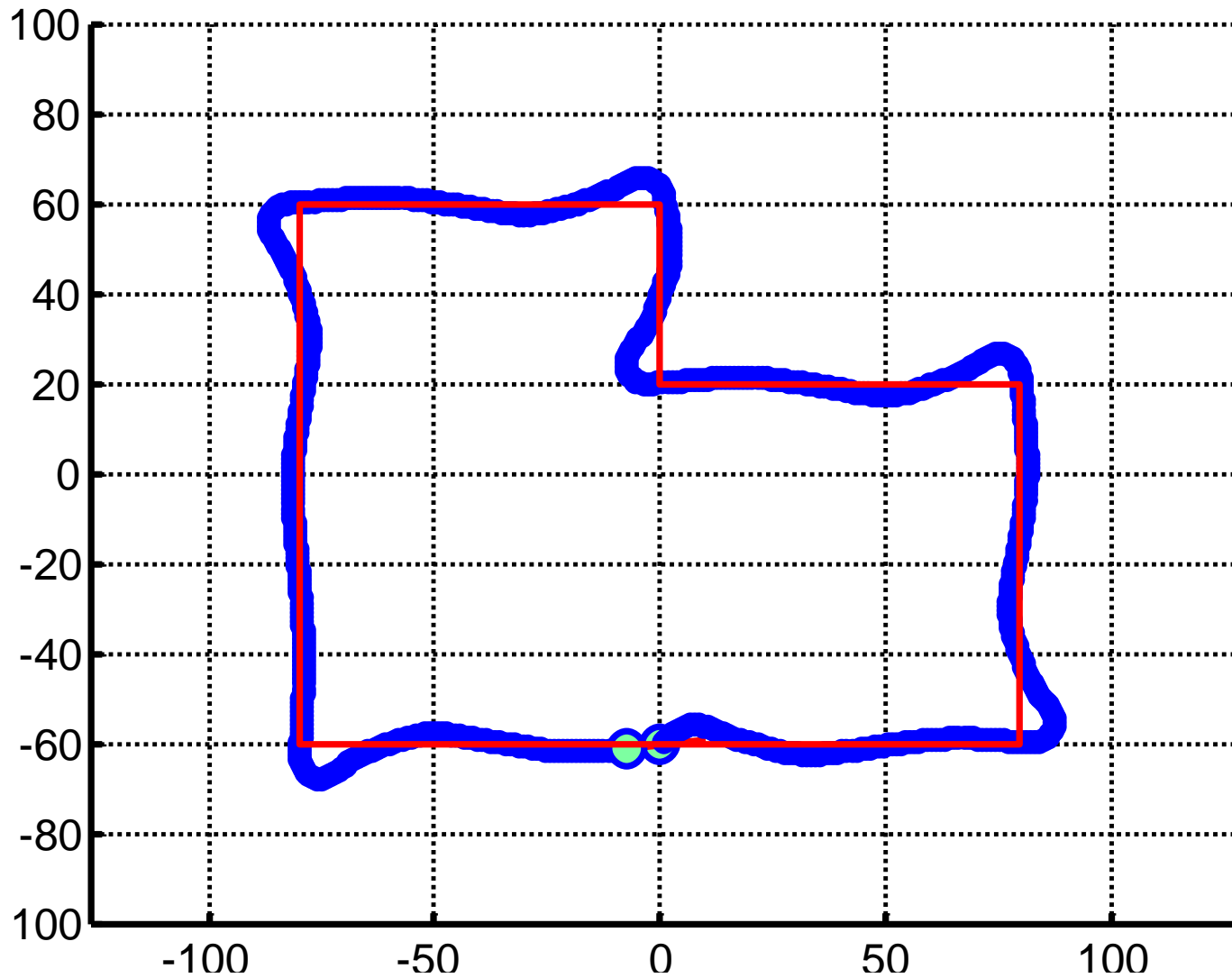
$$\gamma \cong u = K_P e + K_V \dot{e} + K_I \int e(\tau) d\tau$$



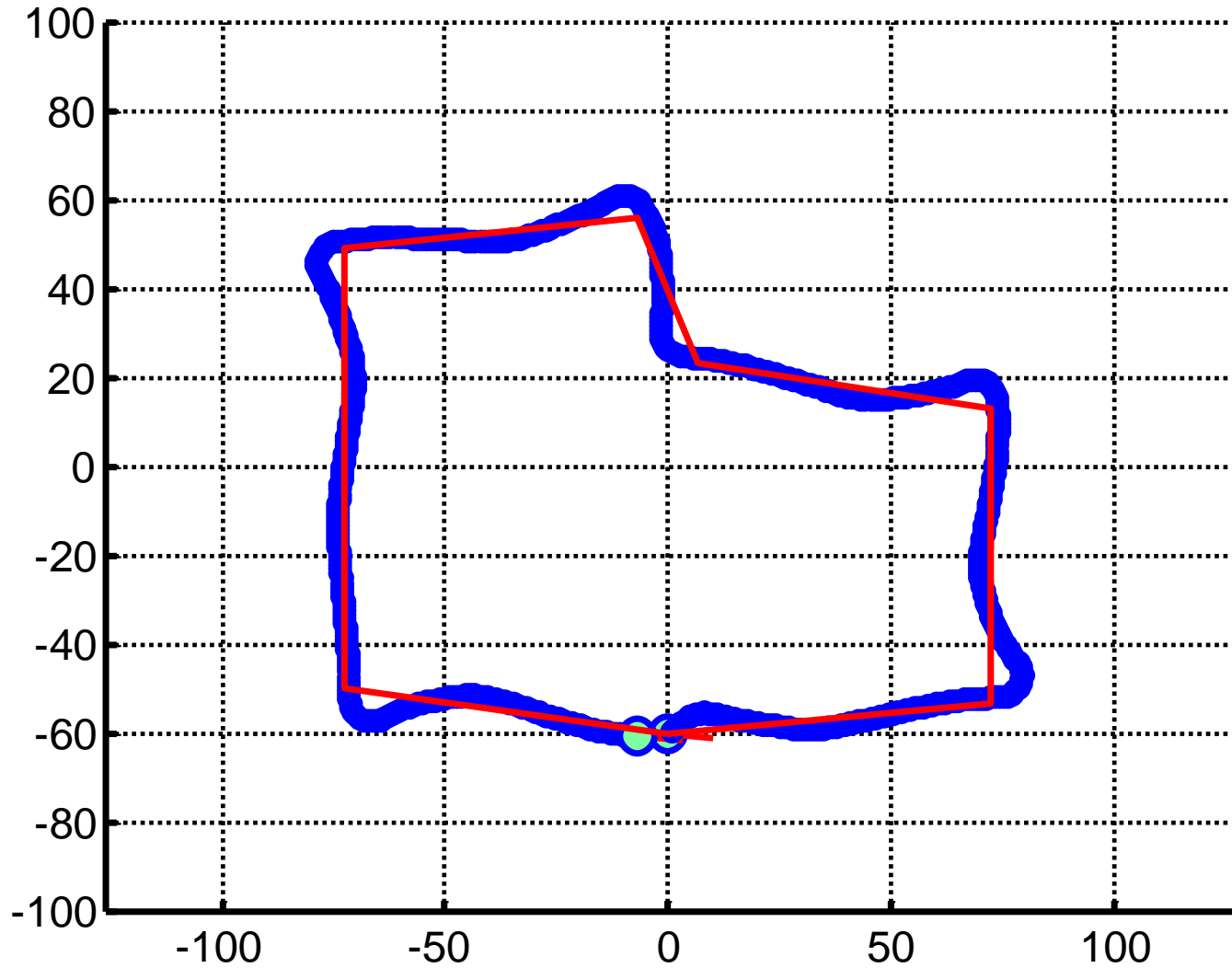


**EXAMPLES**

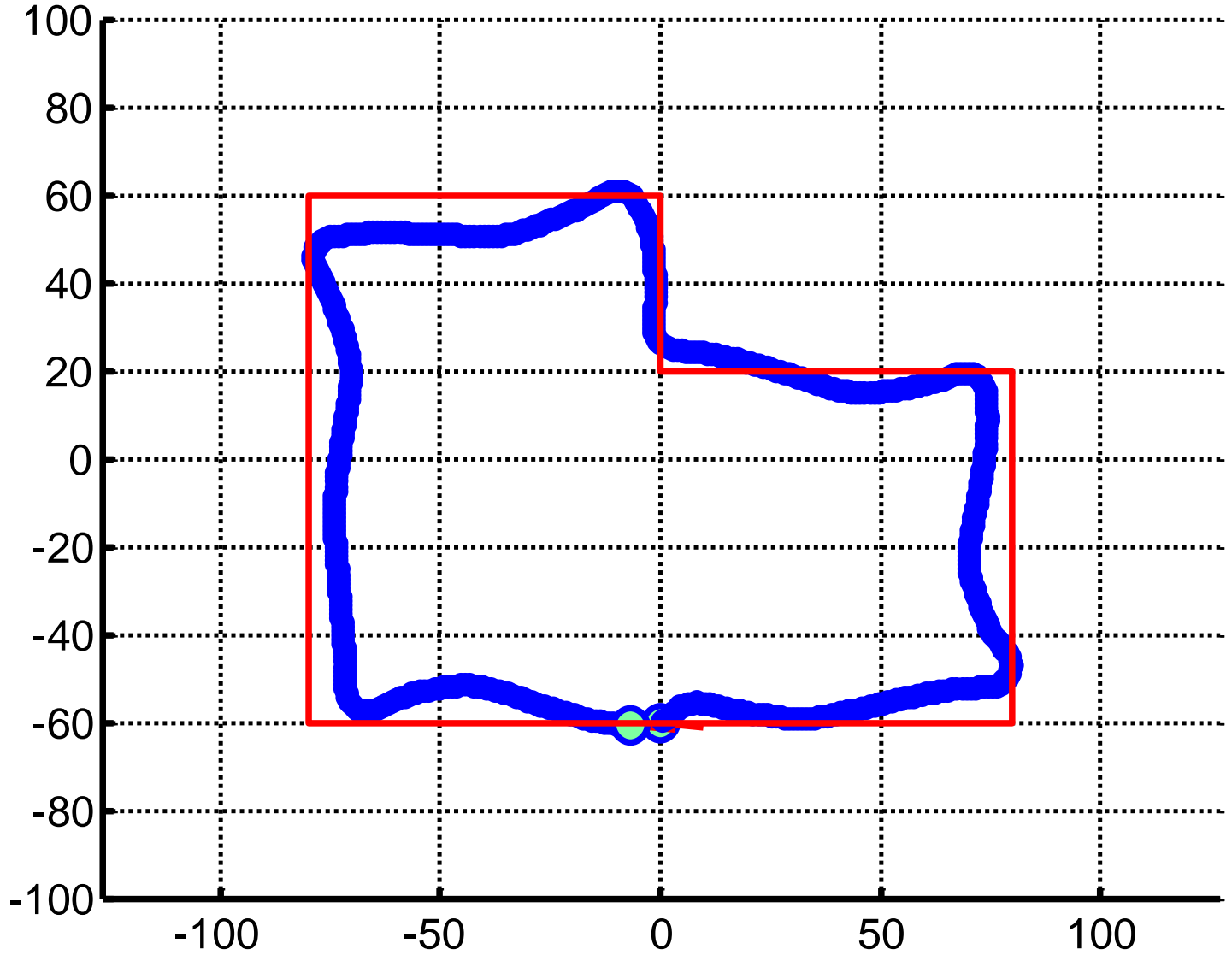
Traietoria Robotului Controlat



Traietoria Robotului Controlat

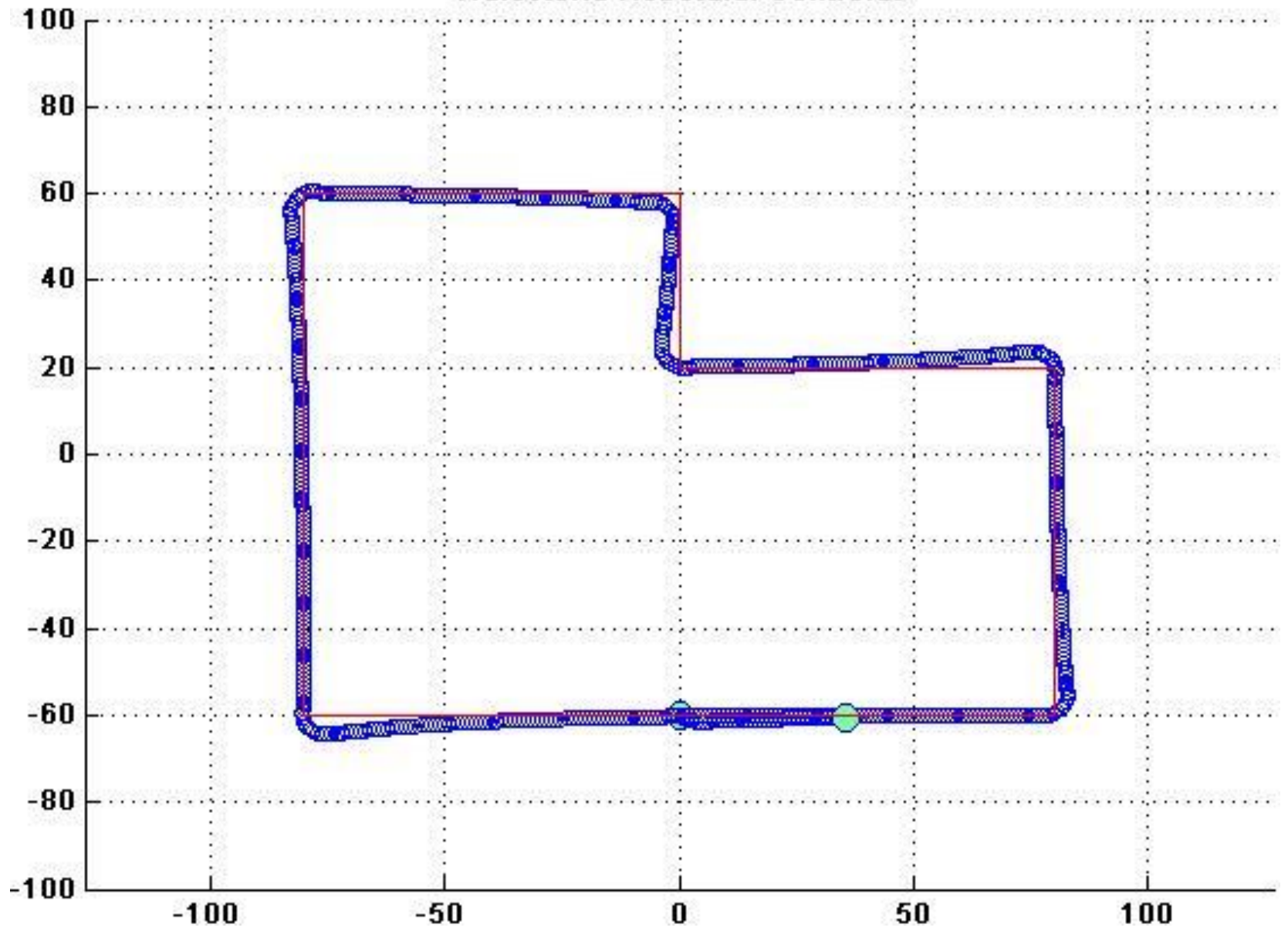


# Traiectoria Robotului Controlat





Traiectoria Robotului Controlat



# **CONCLUSIONS**

- The Comparator design
- The PID controller design