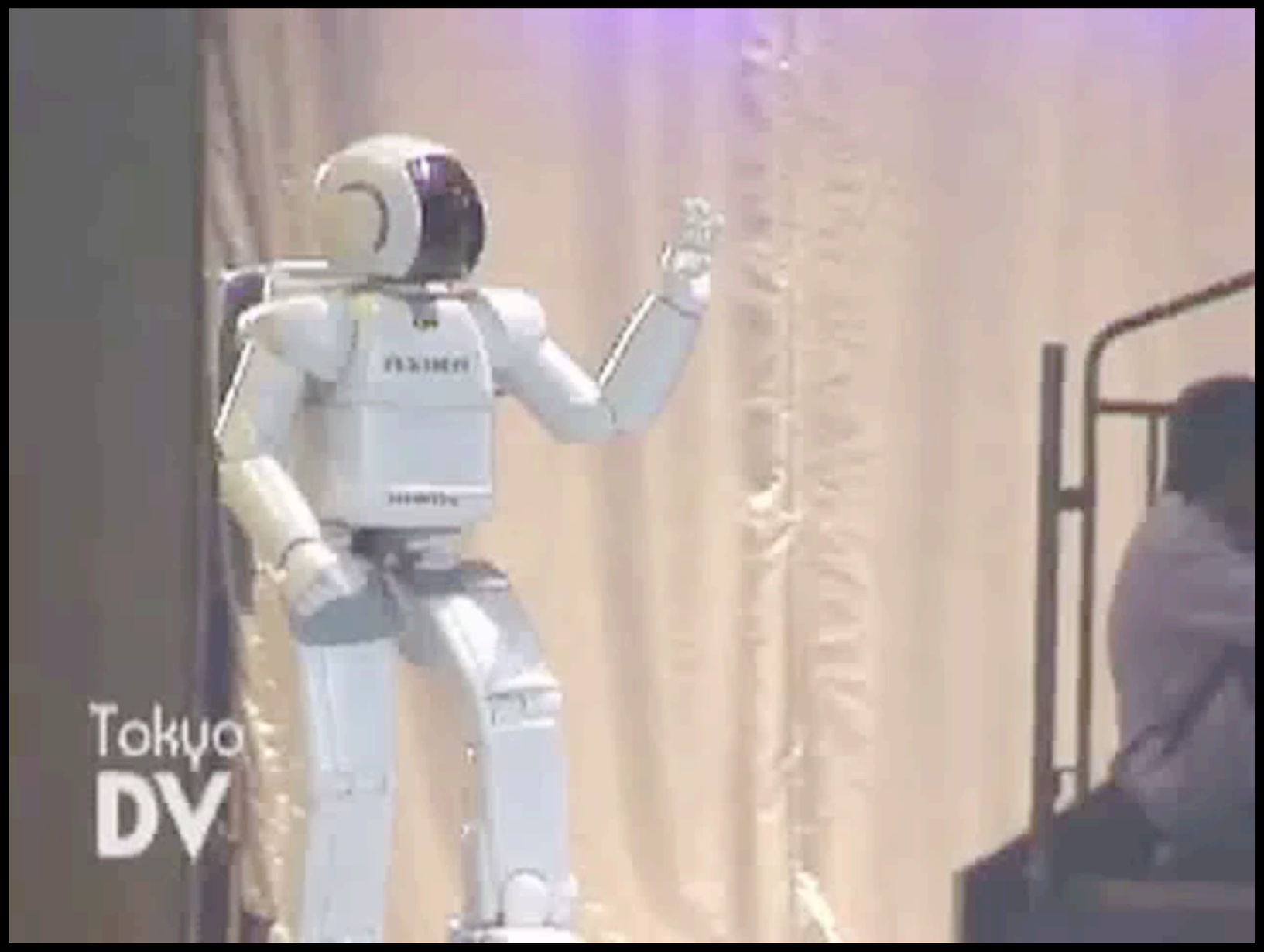
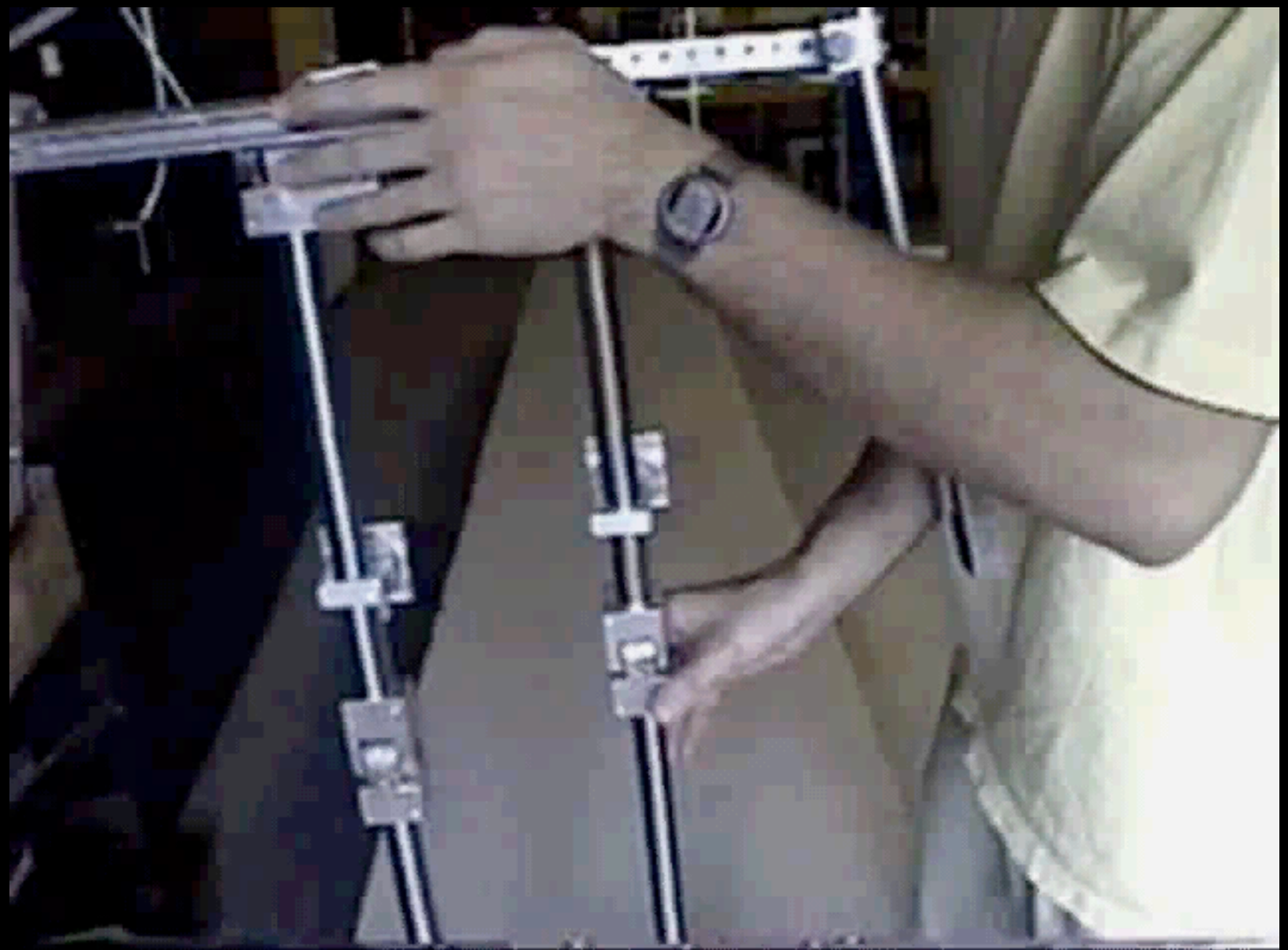
Tuesday, November 15, 2011


Tokyo
DV


BBC

Tuesday, November 15, 2011

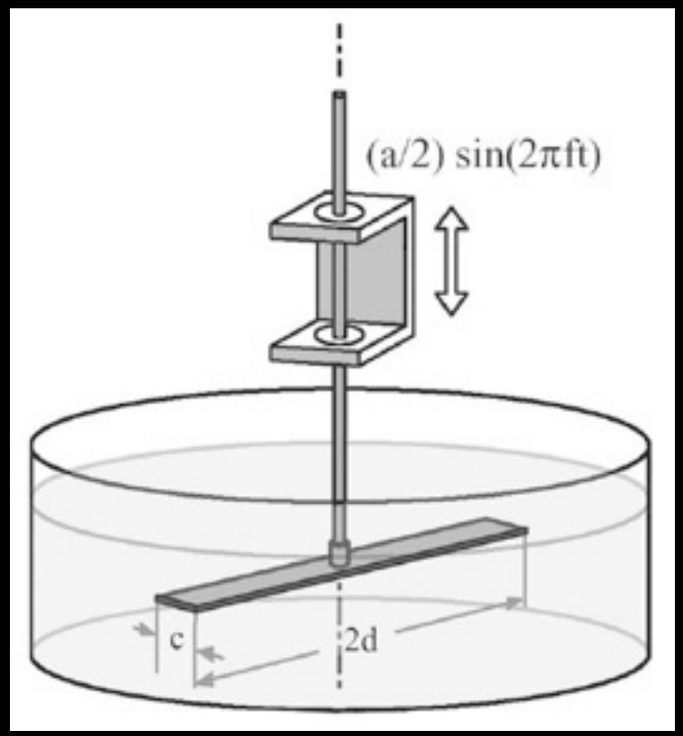


Tuesday, November 15, 2011

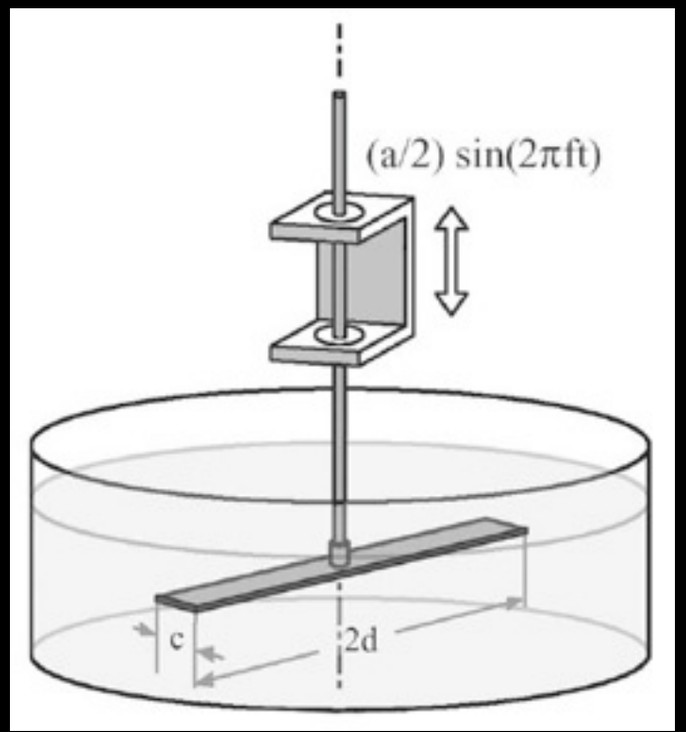
Tuesday, November 15, 2011

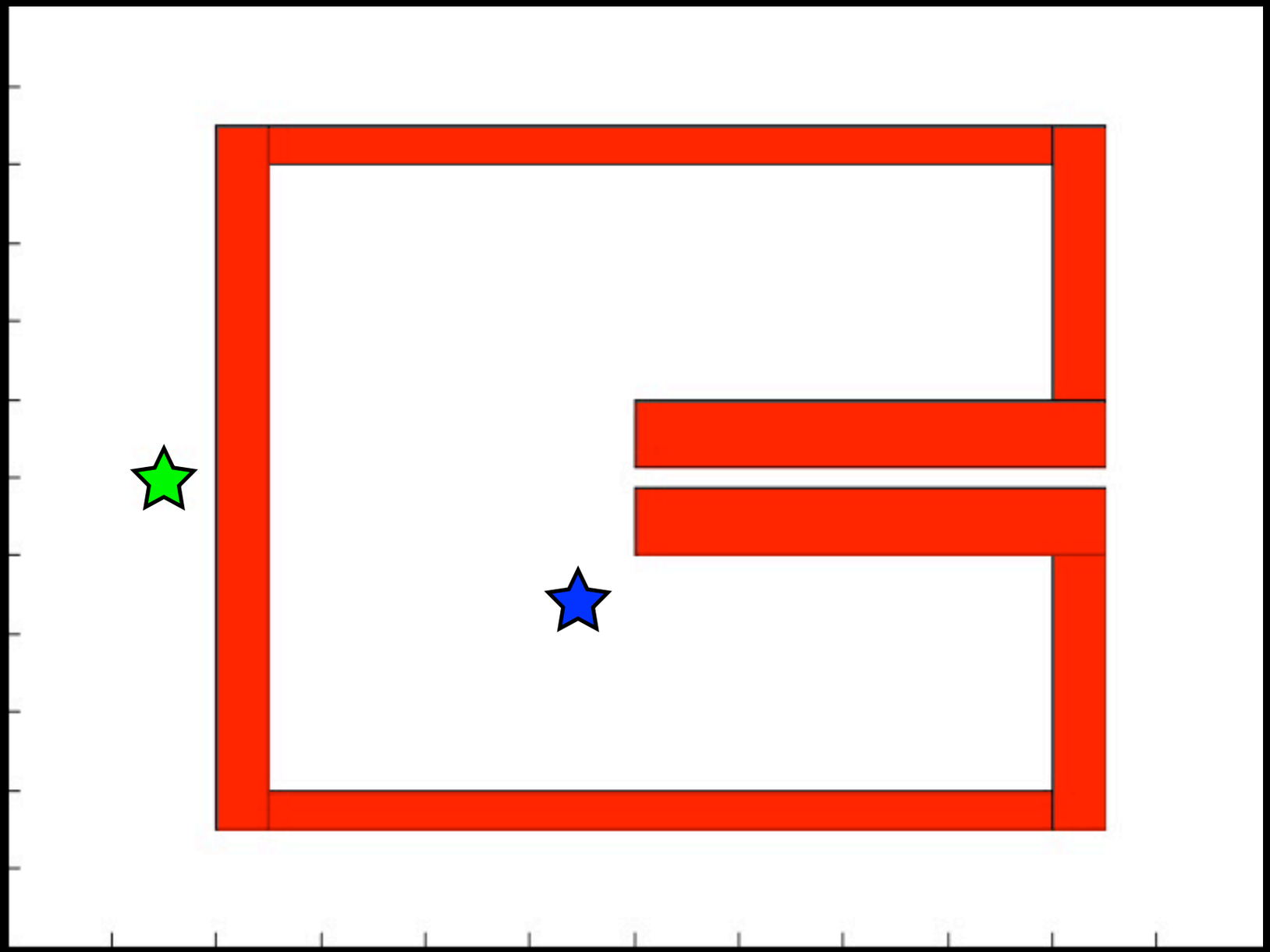
Tedrake, 2004

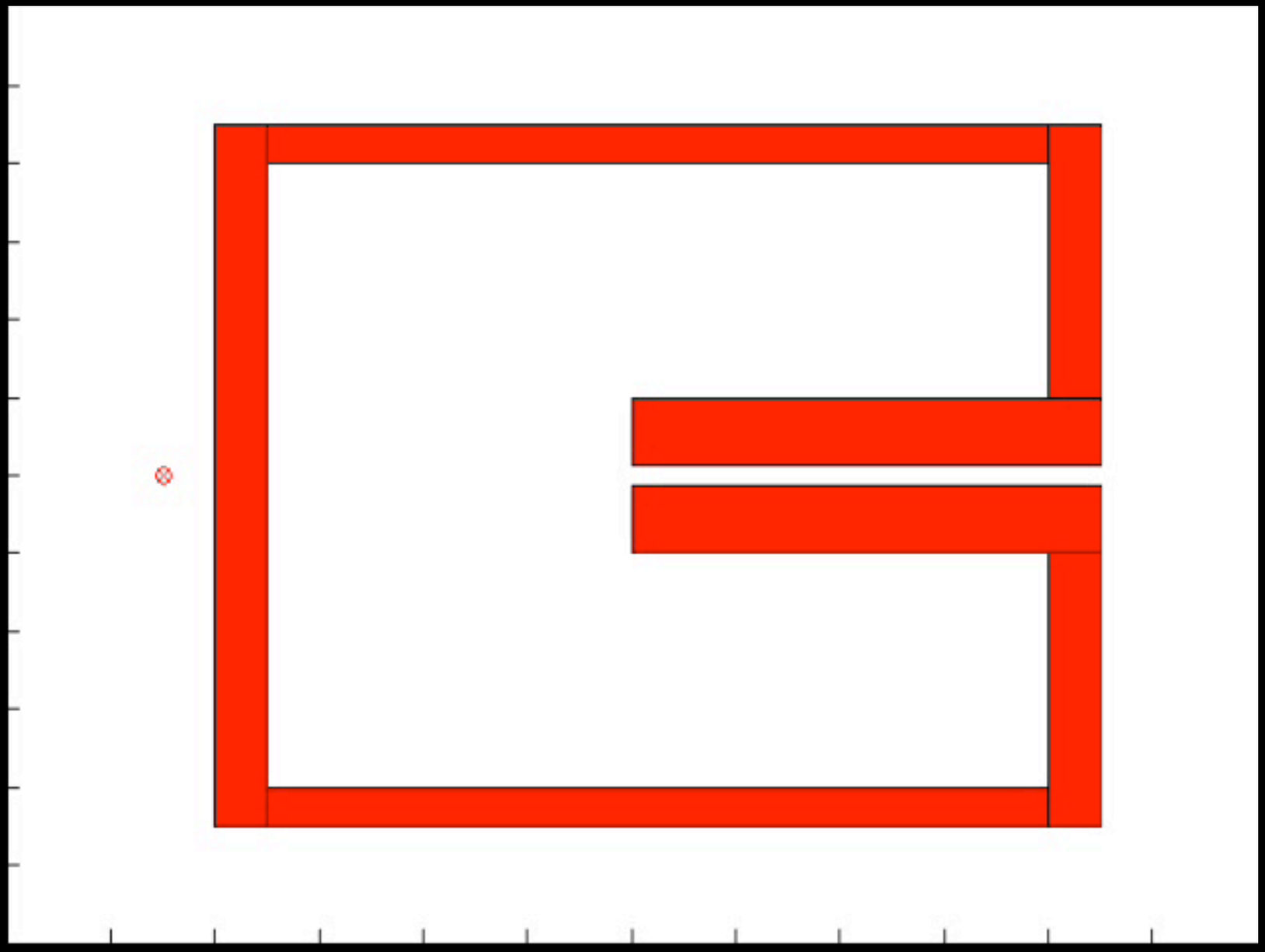
Learning flapping flight



Learning flapping flight

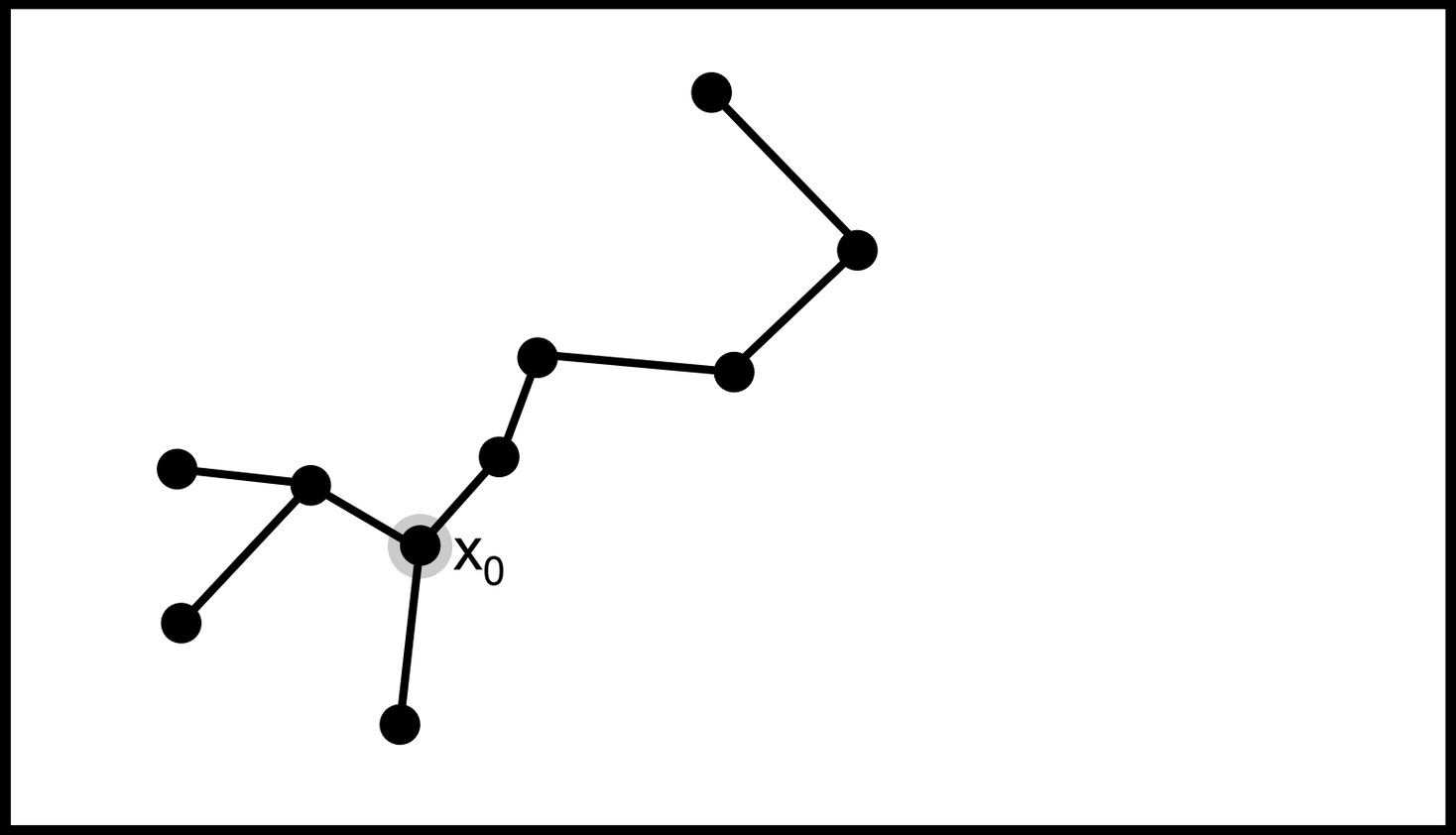






Rapidly Exploring Random Trees (RRTs)

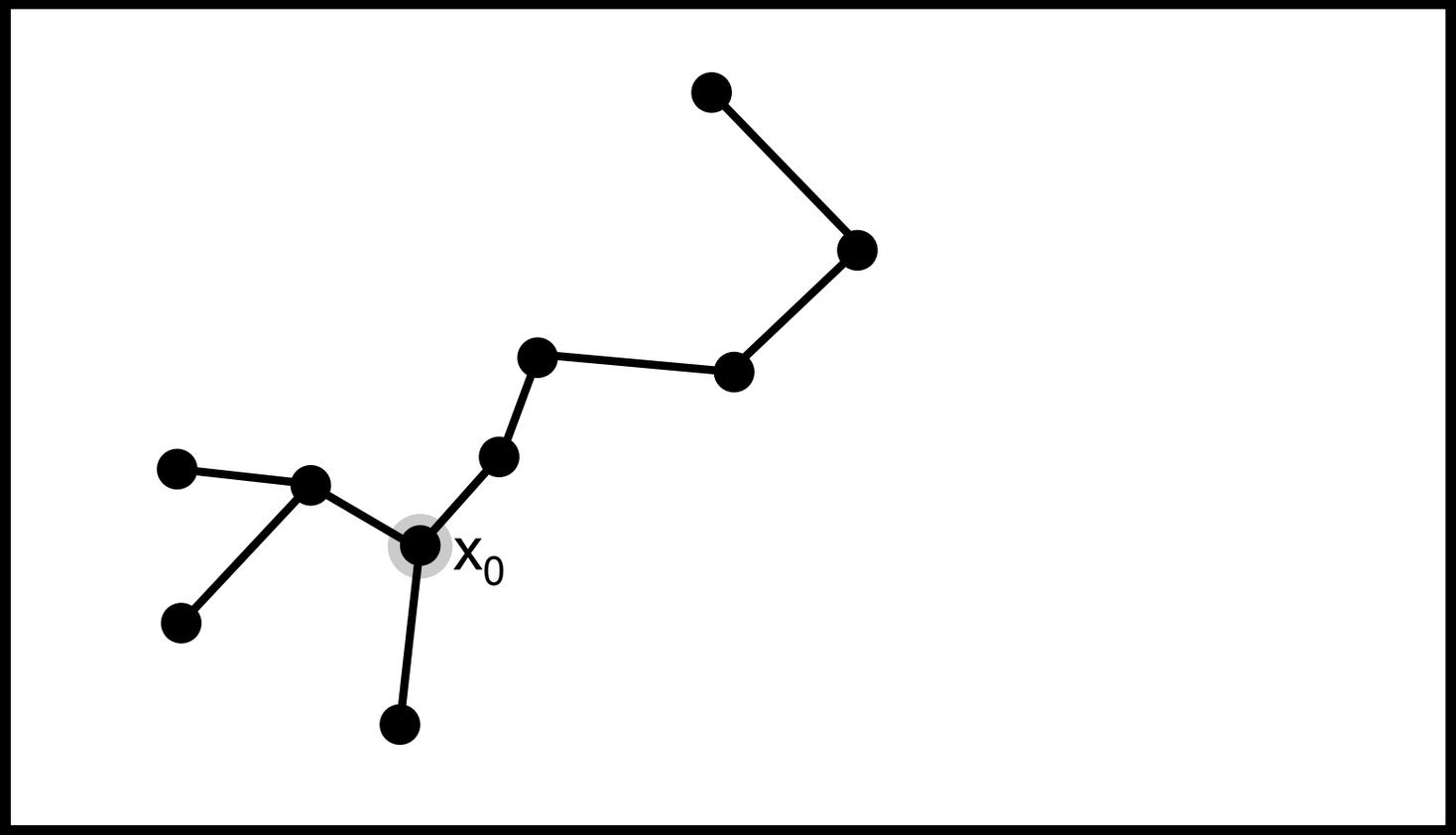
- Steve LaValle, 1998; LaValle and Kuffner, 1999-2001



Nodes represent feasible configurations
Edges represent feasible trajectories

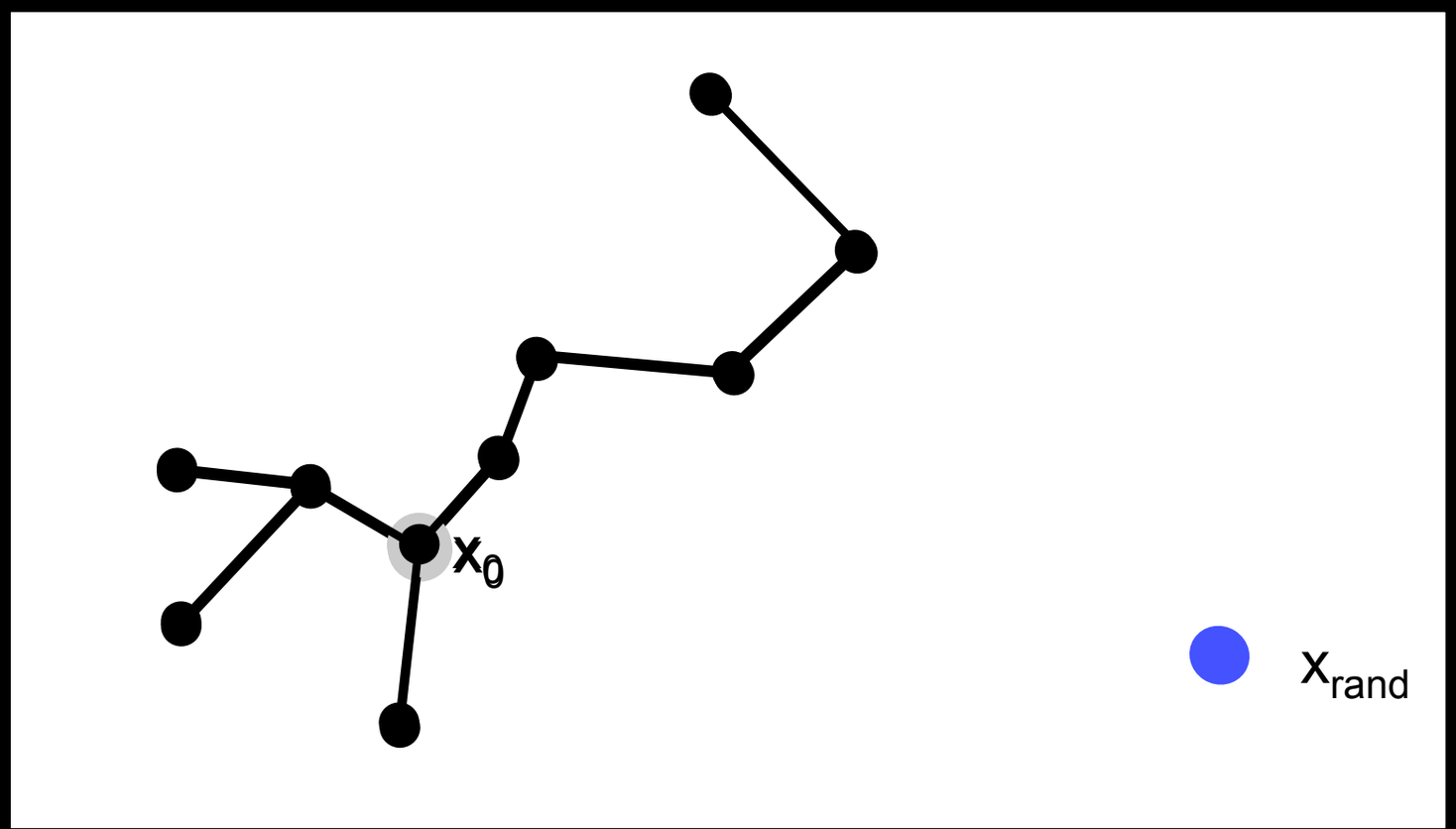
Rapidly Exploring Random Trees (RRTs)

- Steve LaValle, 1998; LaValle and Kuffner, 1999-2001



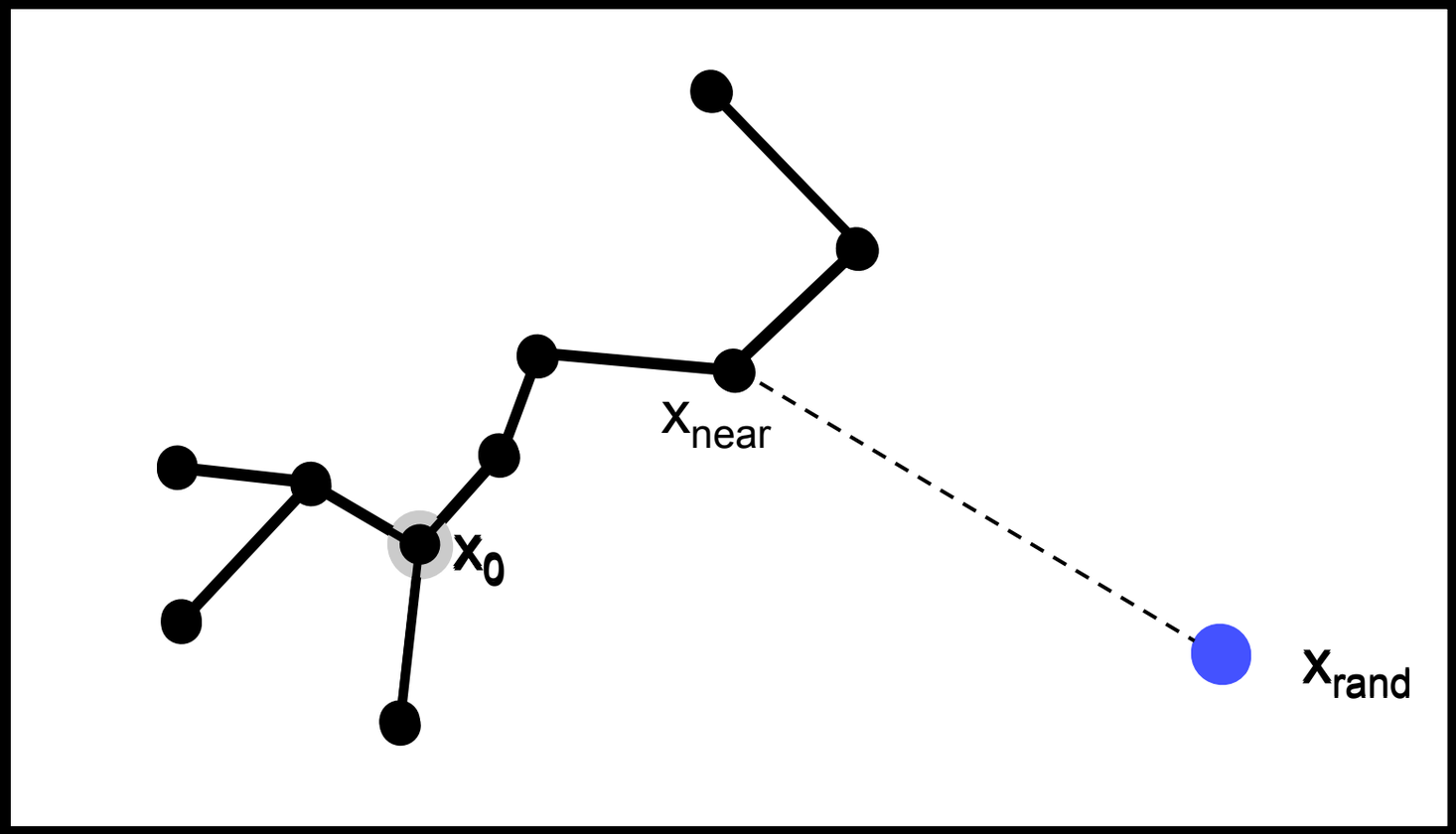
Rapidly Exploring Random Trees (RRTs)

- Steve LaValle, 1998; LaValle and Kuffner, 1999-2001



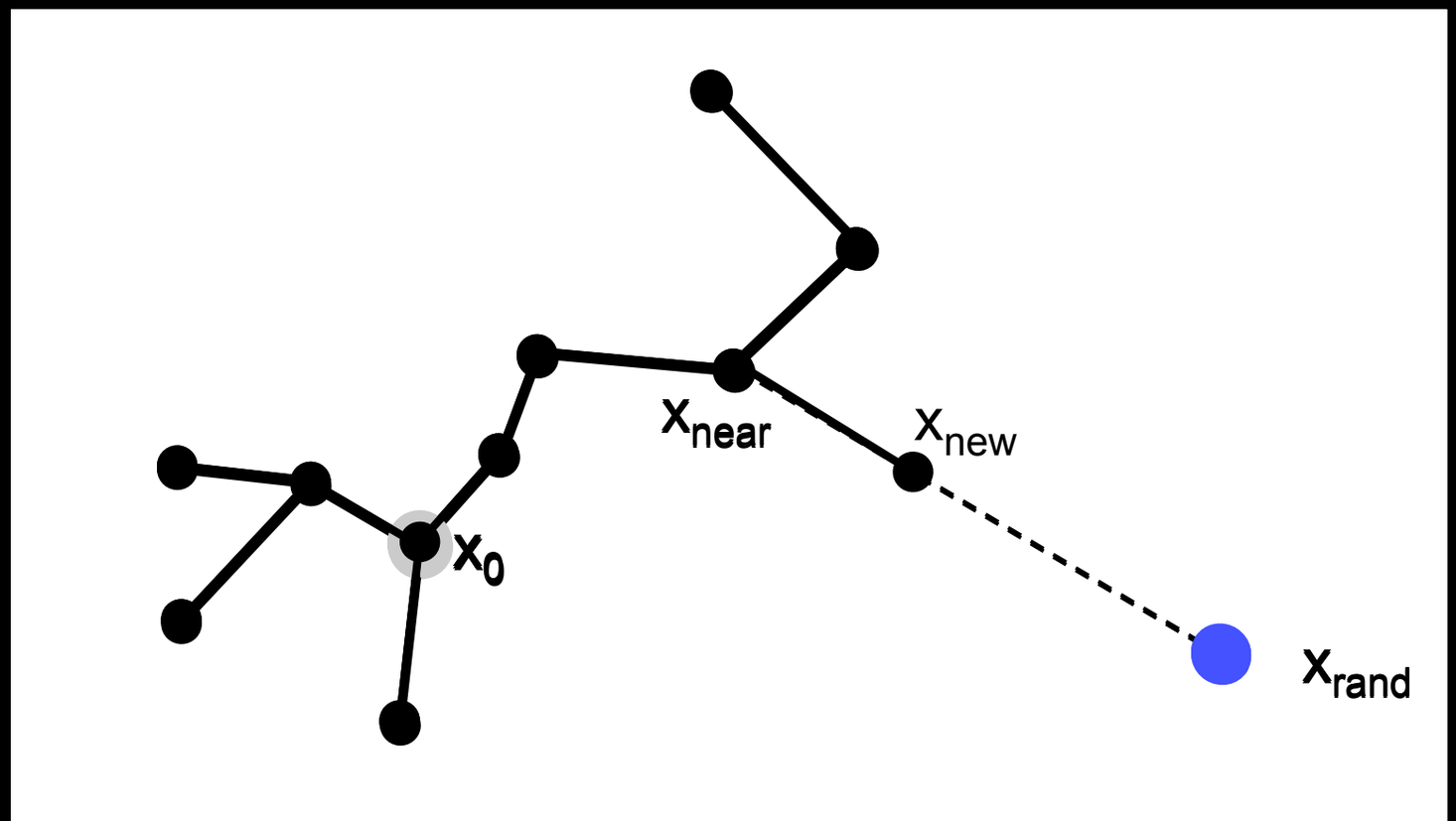
Rapidly Exploring Random Trees (RRTs)

- Steve LaValle, 1998; LaValle and Kuffner, 1999-2001



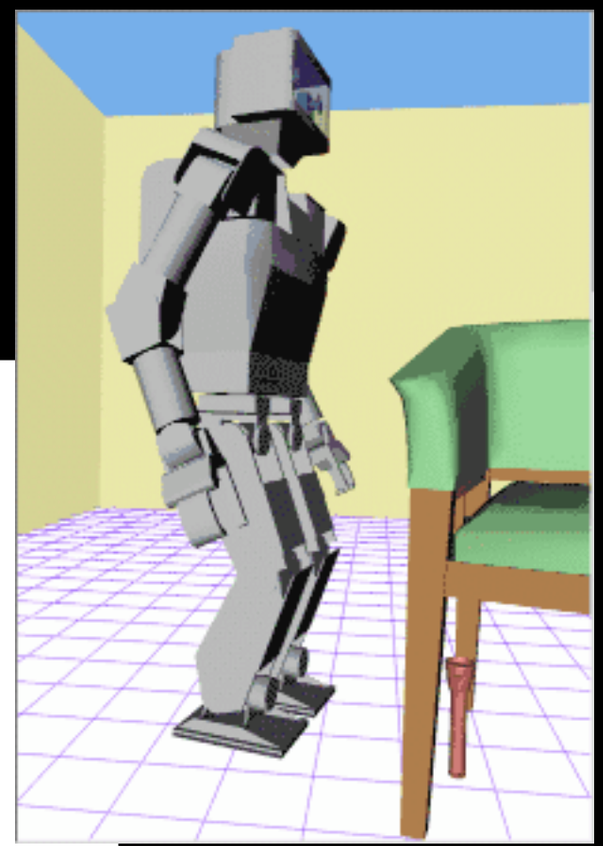
Rapidly Exploring Random Trees (RRTs)

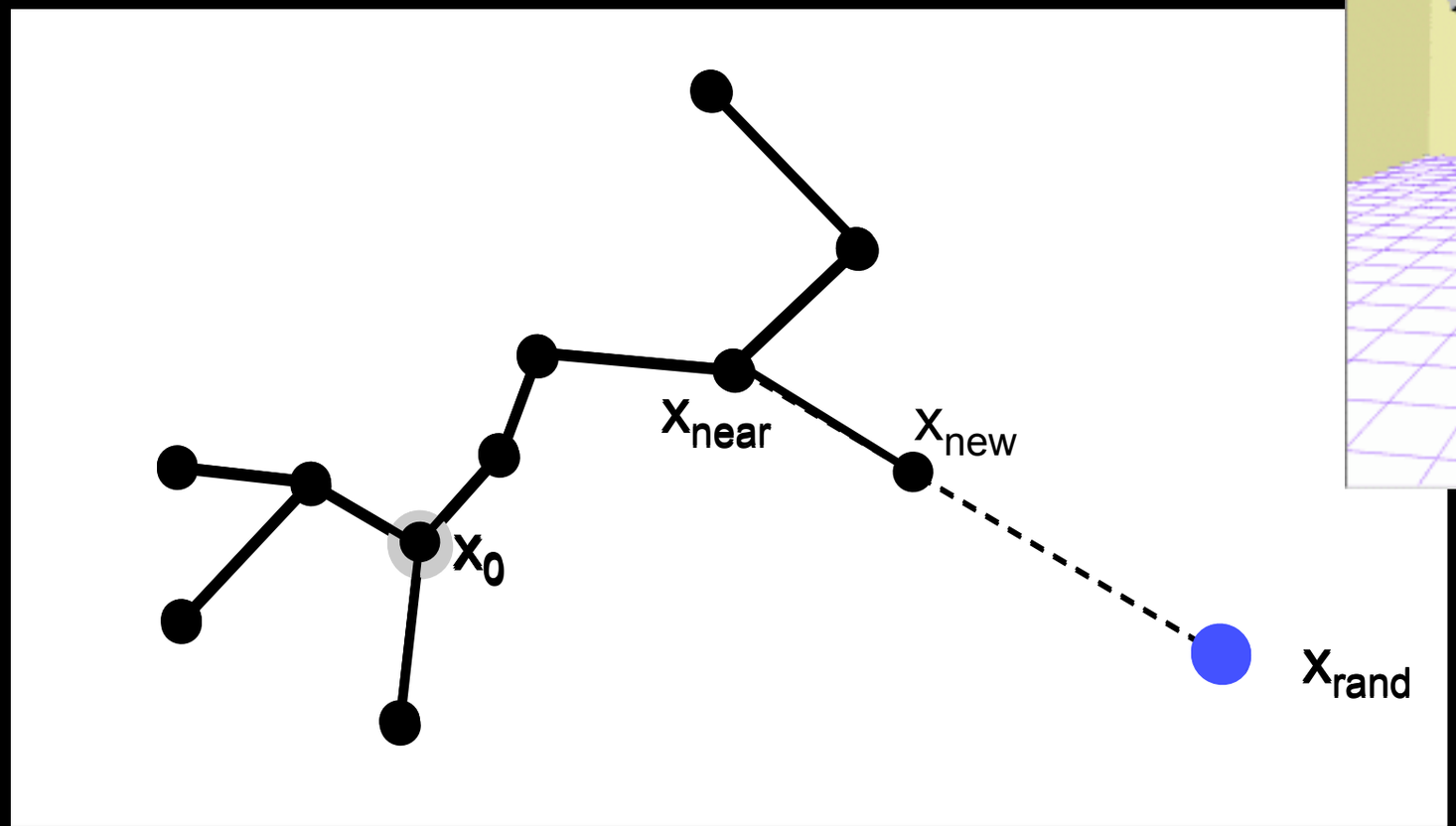
- Steve LaValle, 1998; LaValle and Kuffner, 1999-2001

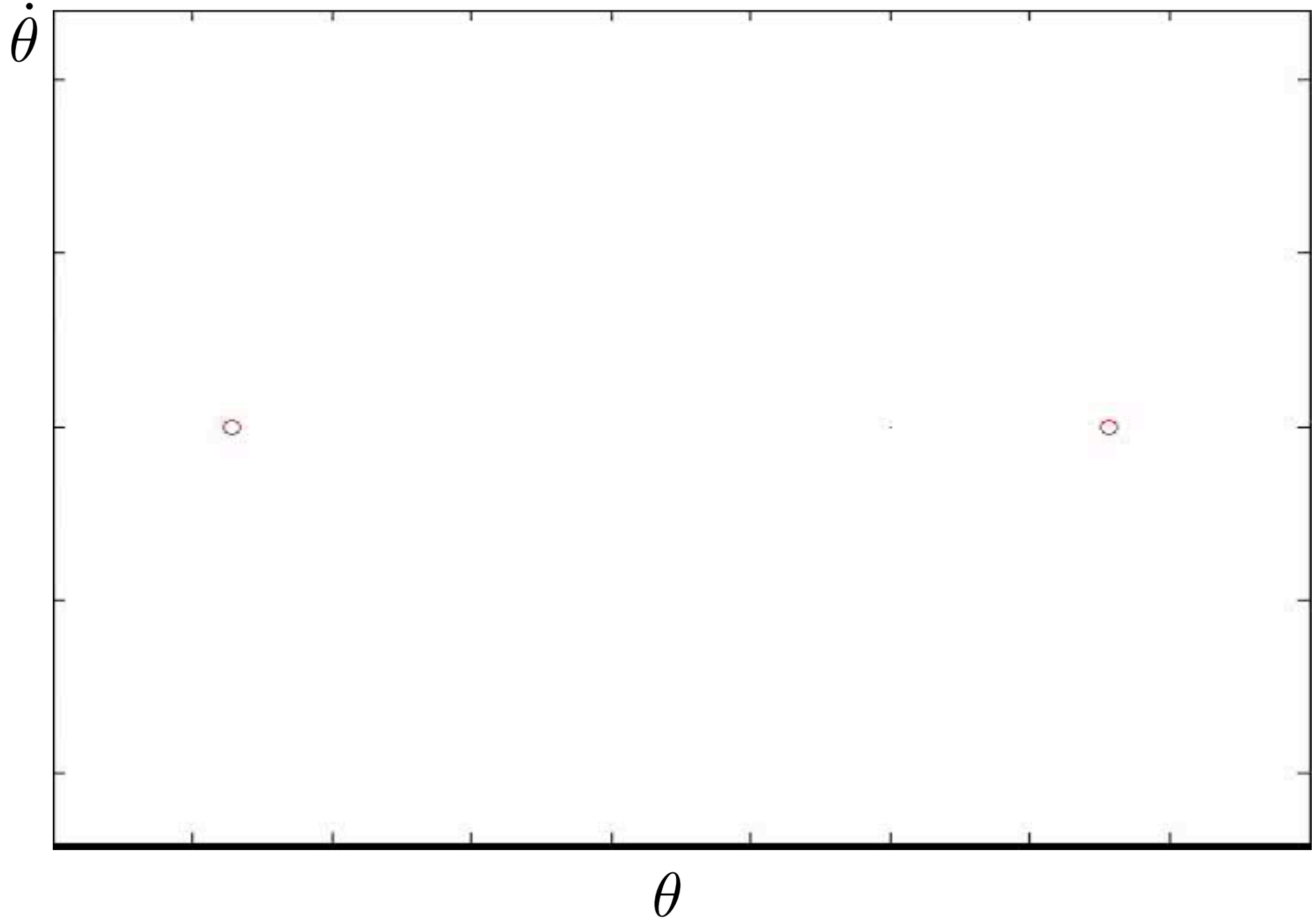


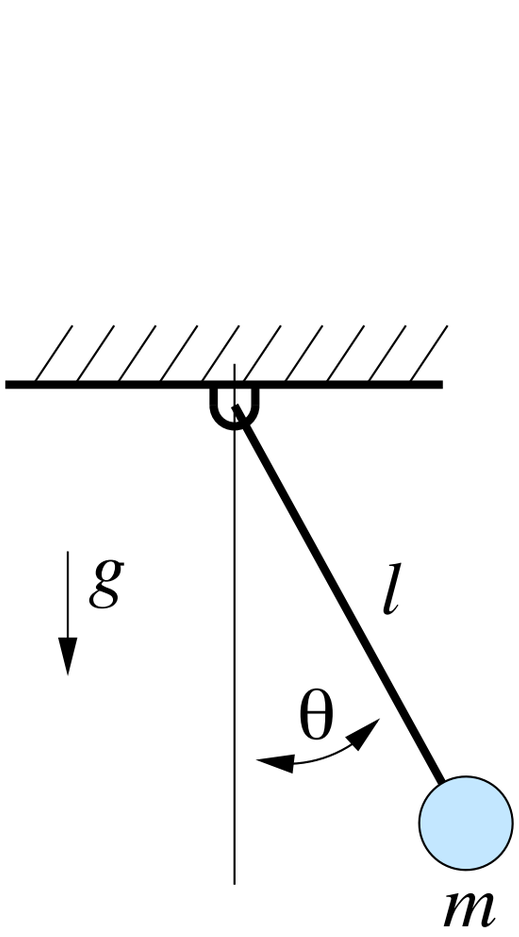
Rapidly Exploring Random Trees (RRTs)

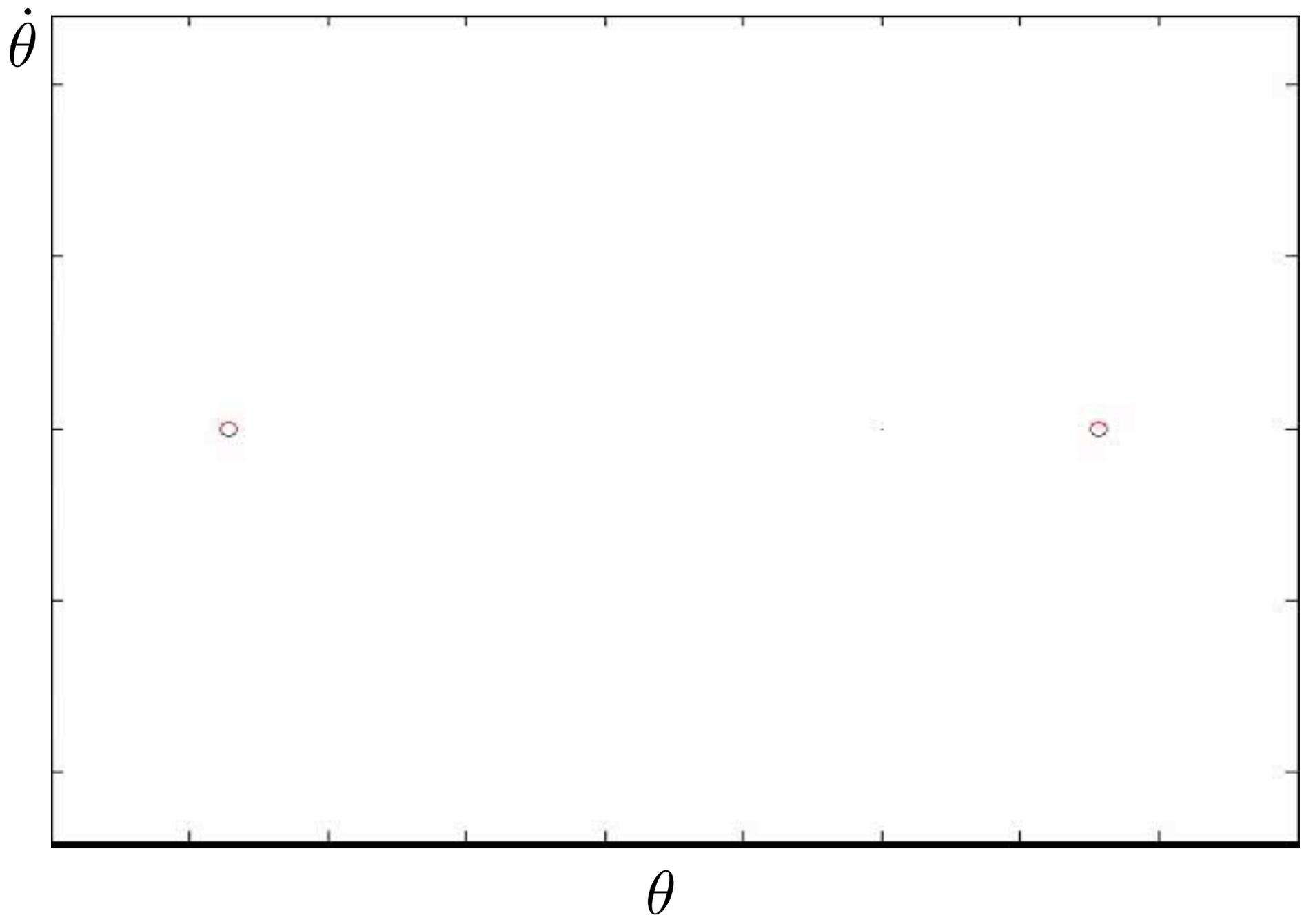
- Steve LaValle, 1998; LaValle and Kuffner, 1999-2001

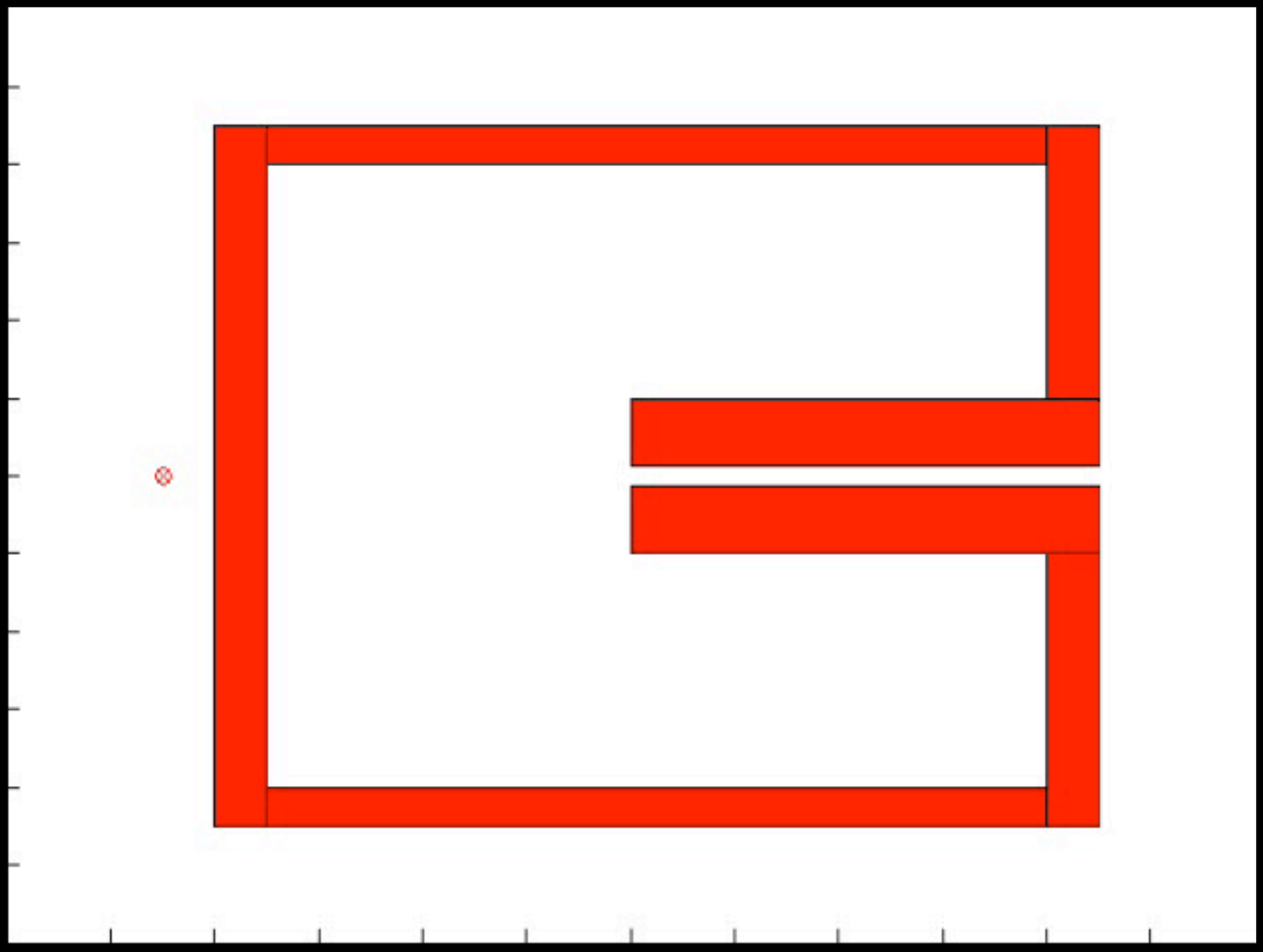





$\dot{\theta}$
θ


g
l
θ
m

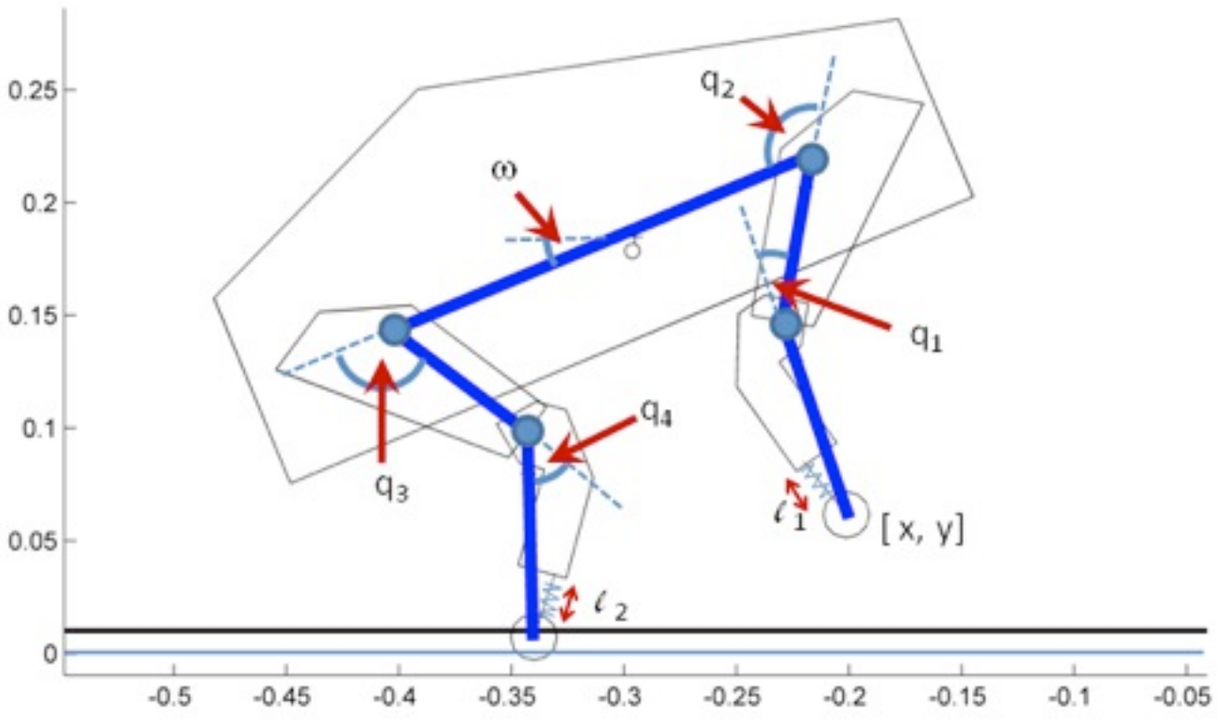

$\dot{\theta}$
θ



Tuesday, November 15, 2011

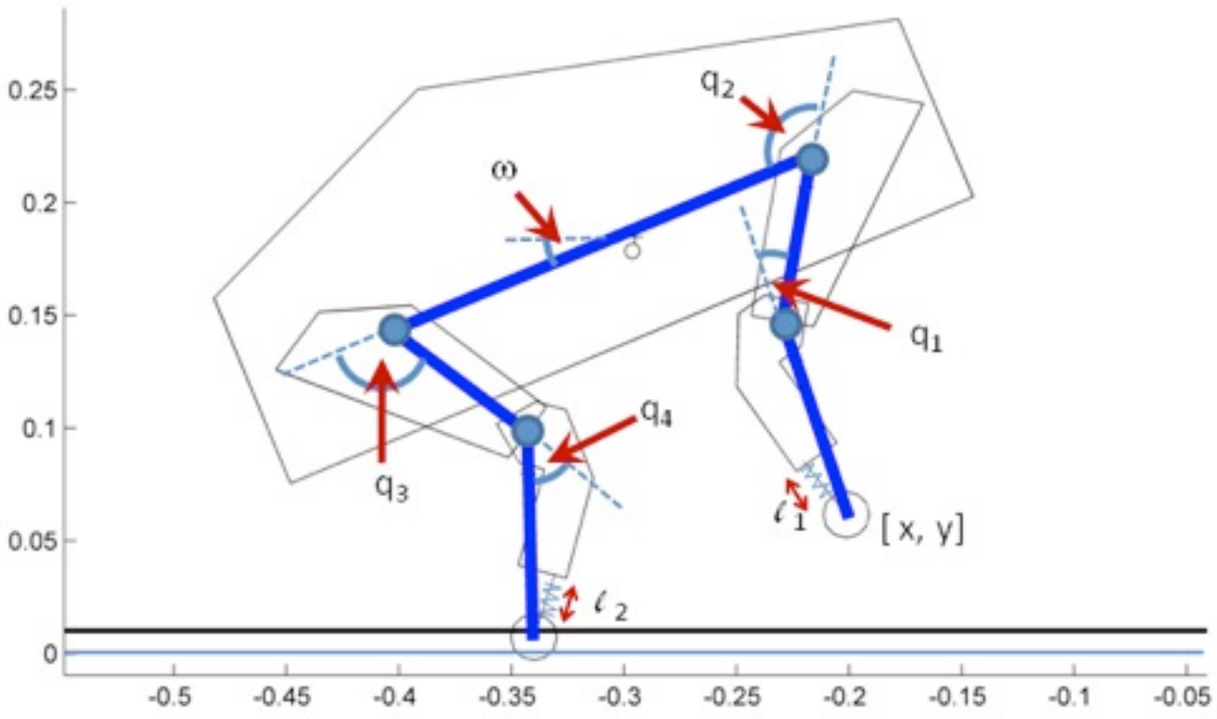
Tuesday, November 15, 2011

Example: LittleDog Bounding Over Terrain



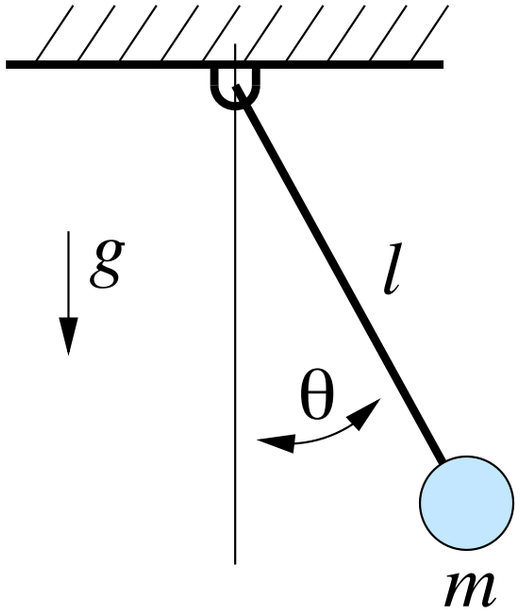
- Accurate dynamic model

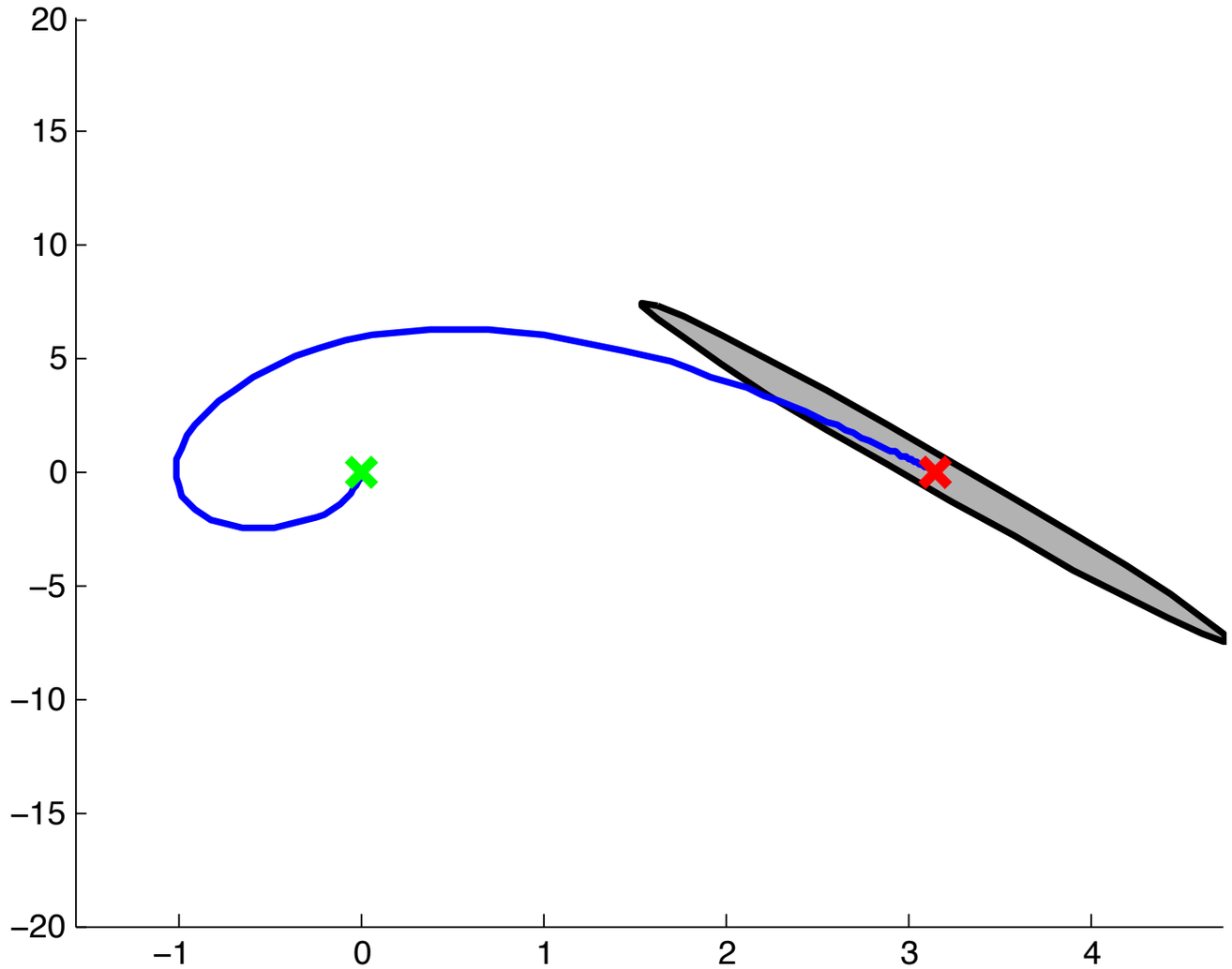
Example: LittleDog Bounding Over Terrain



- Accurate dynamic model
- Plan in the space of "half-bound" primitives

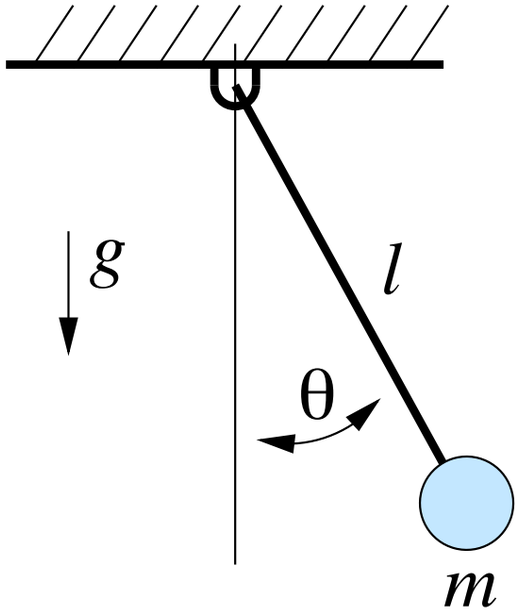
Dynamic Invariant Sets Around Trajectories

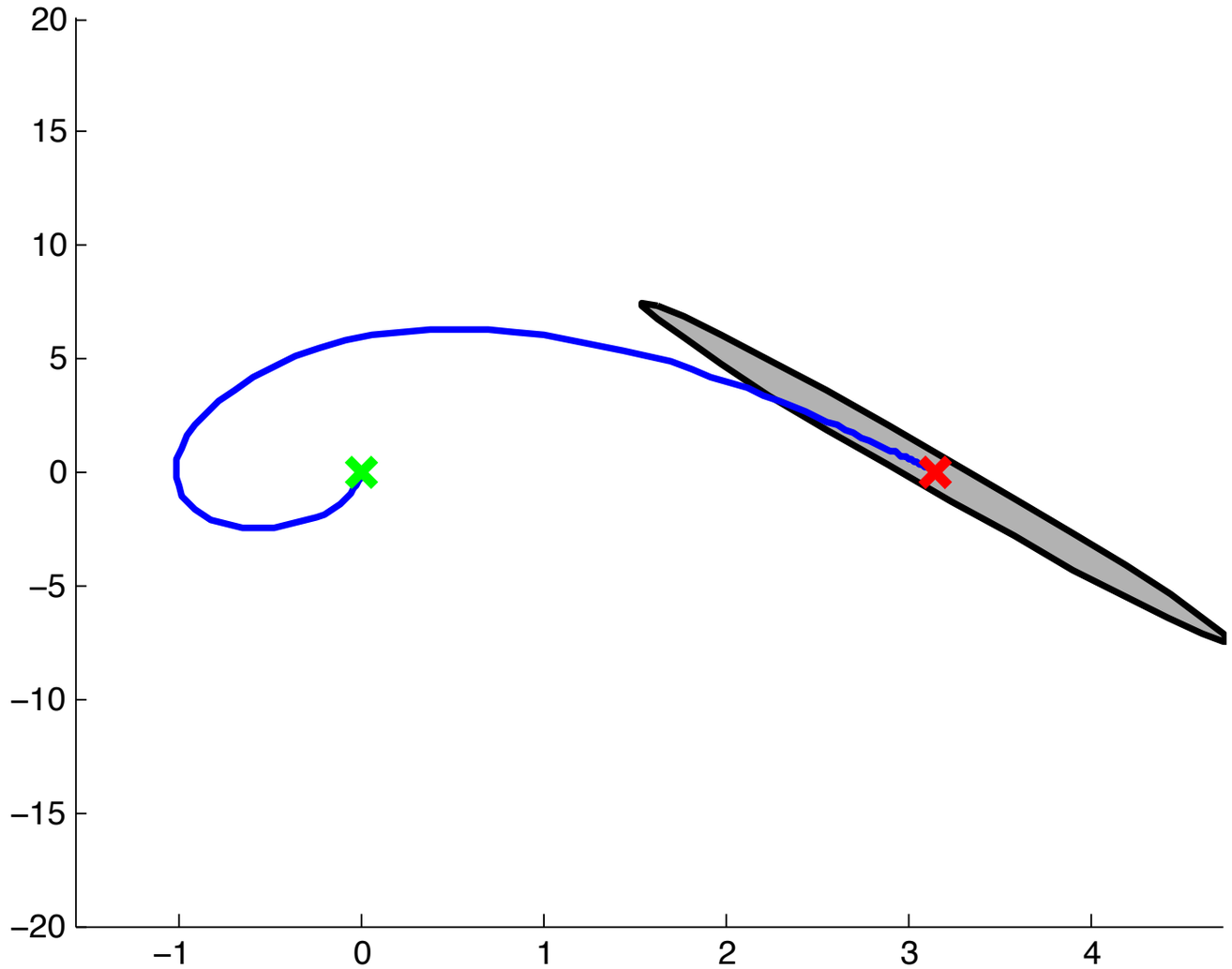




Dynamic Invariant Sets Around Trajectories

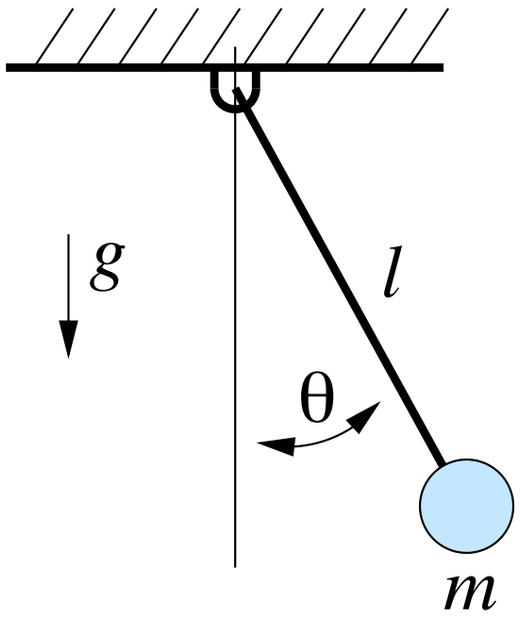
- Effectively solve many funnels along the trajectory (making sure that one dumps into the other) [Tobenkin10] .

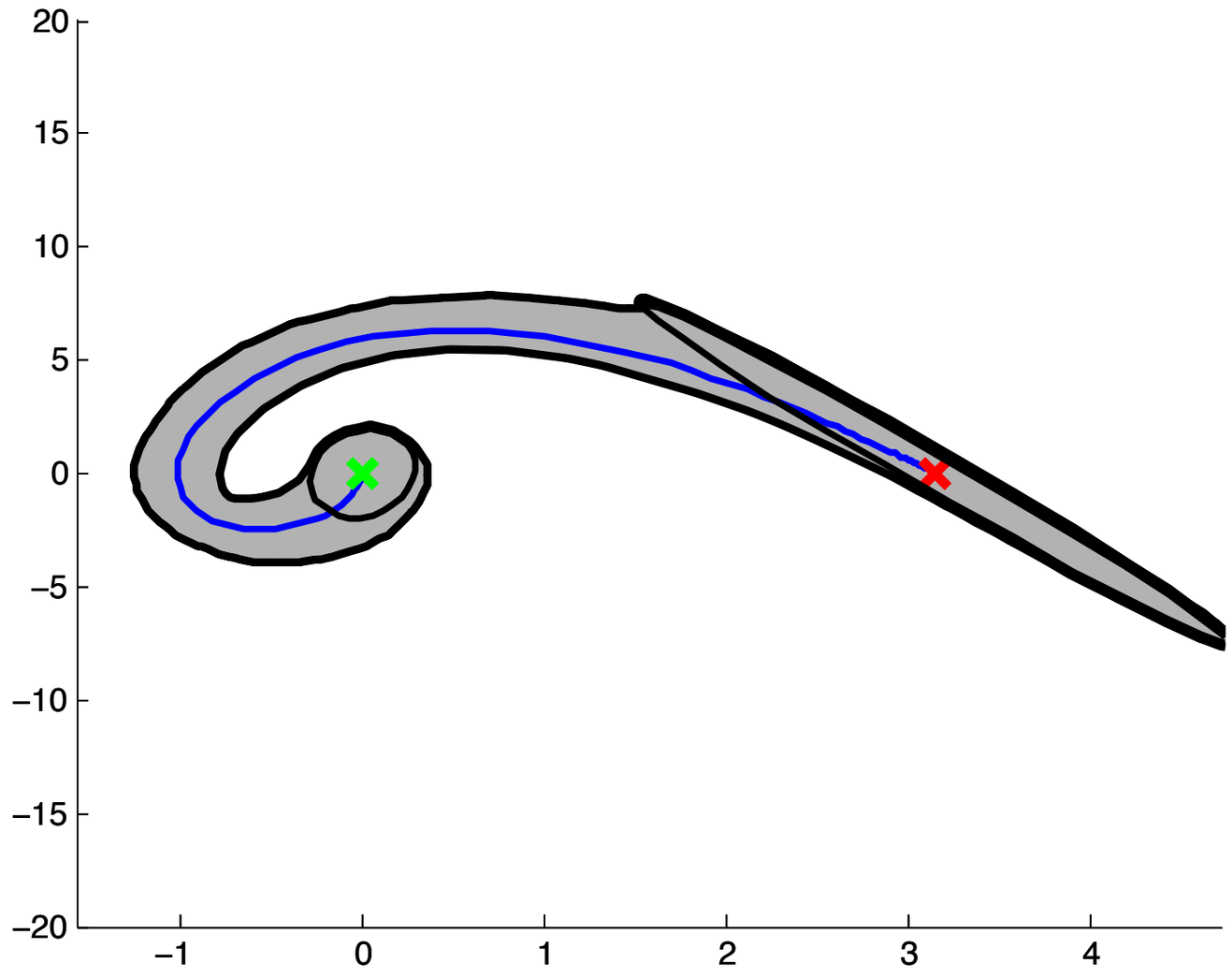




Dynamic Invariant Sets Around Trajectories

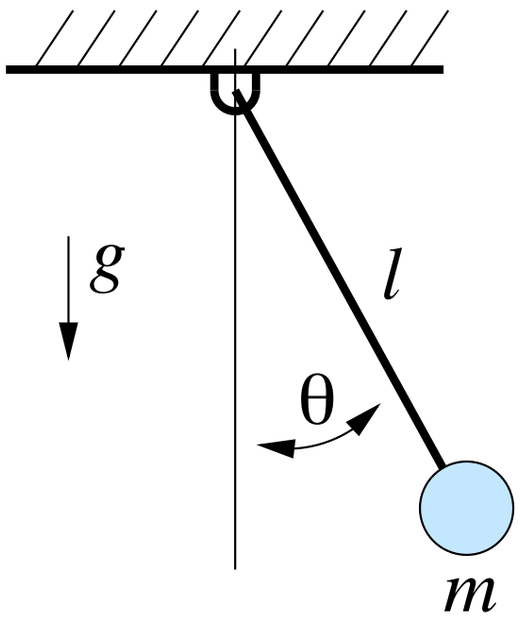
- Effectively solve many funnels along the trajectory (making sure that one dumps into the other) [Tobenkin10] .

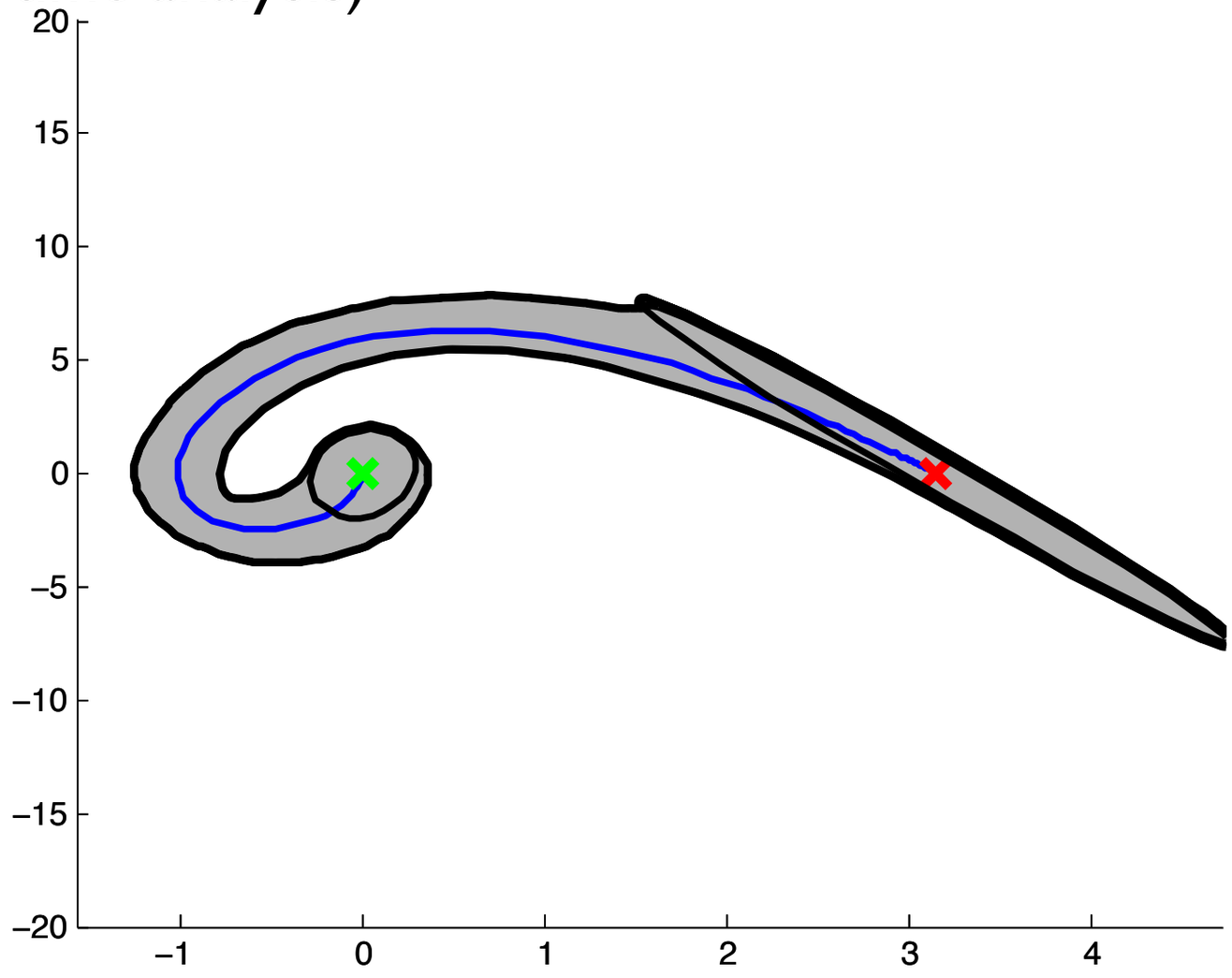




Dynamic Invariant Sets Around Trajectories

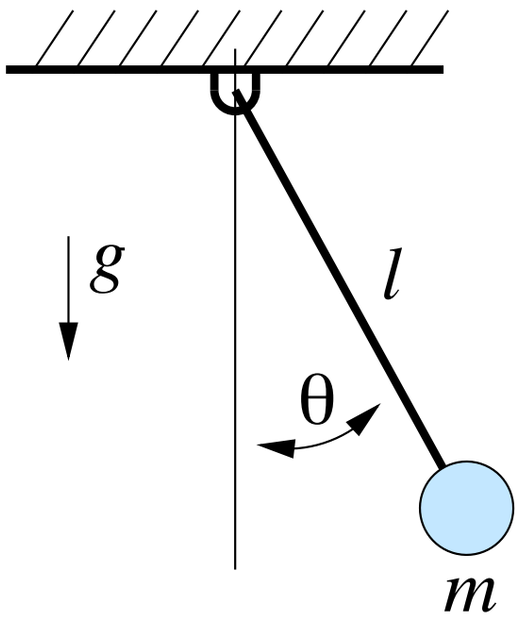
- Effectively solve many funnels along the trajectory (making sure that one dumps into the other) [Tobenkin10] .
- Stability not required (finite-time analysis)

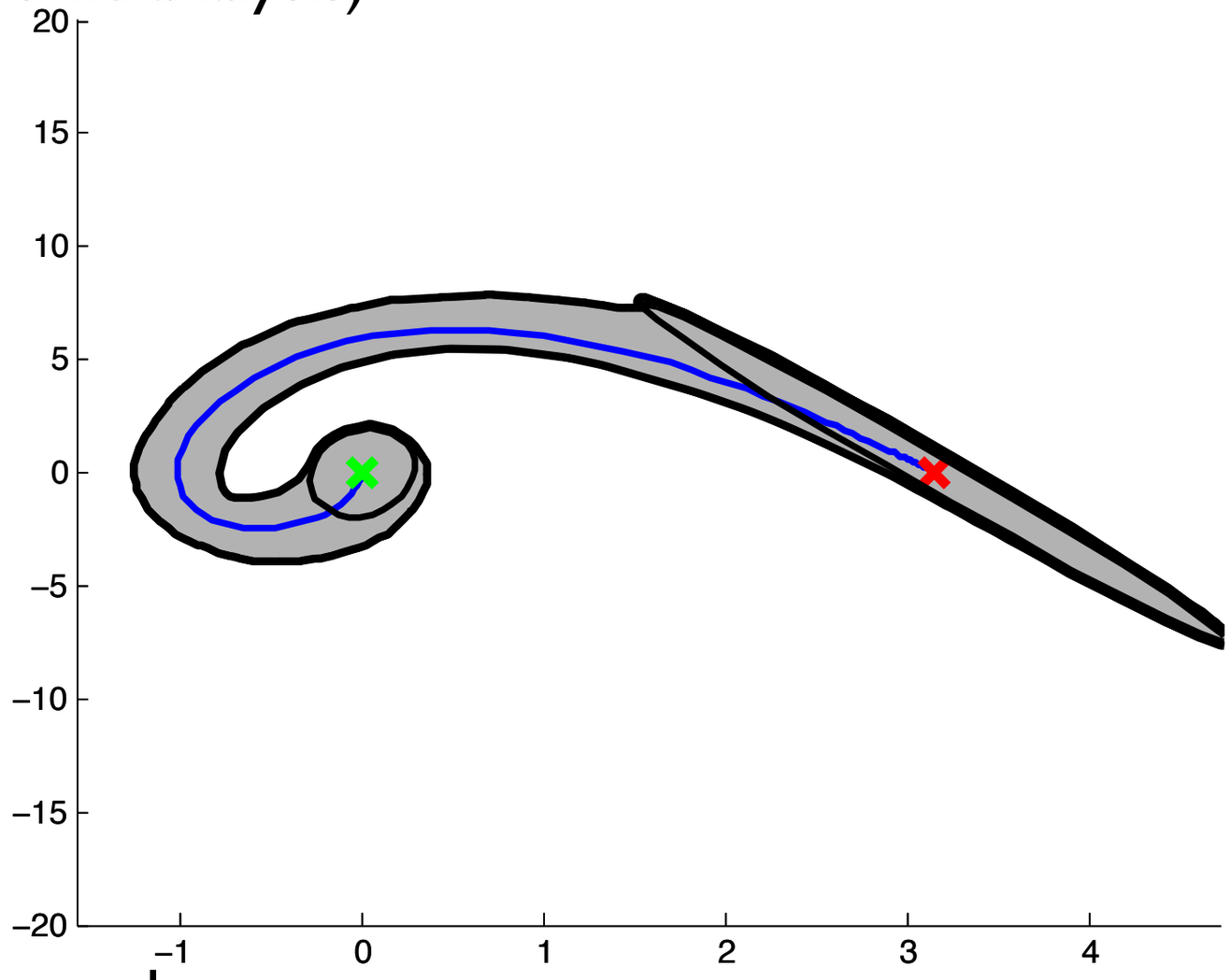




Dynamic Invariant Sets Around Trajectories

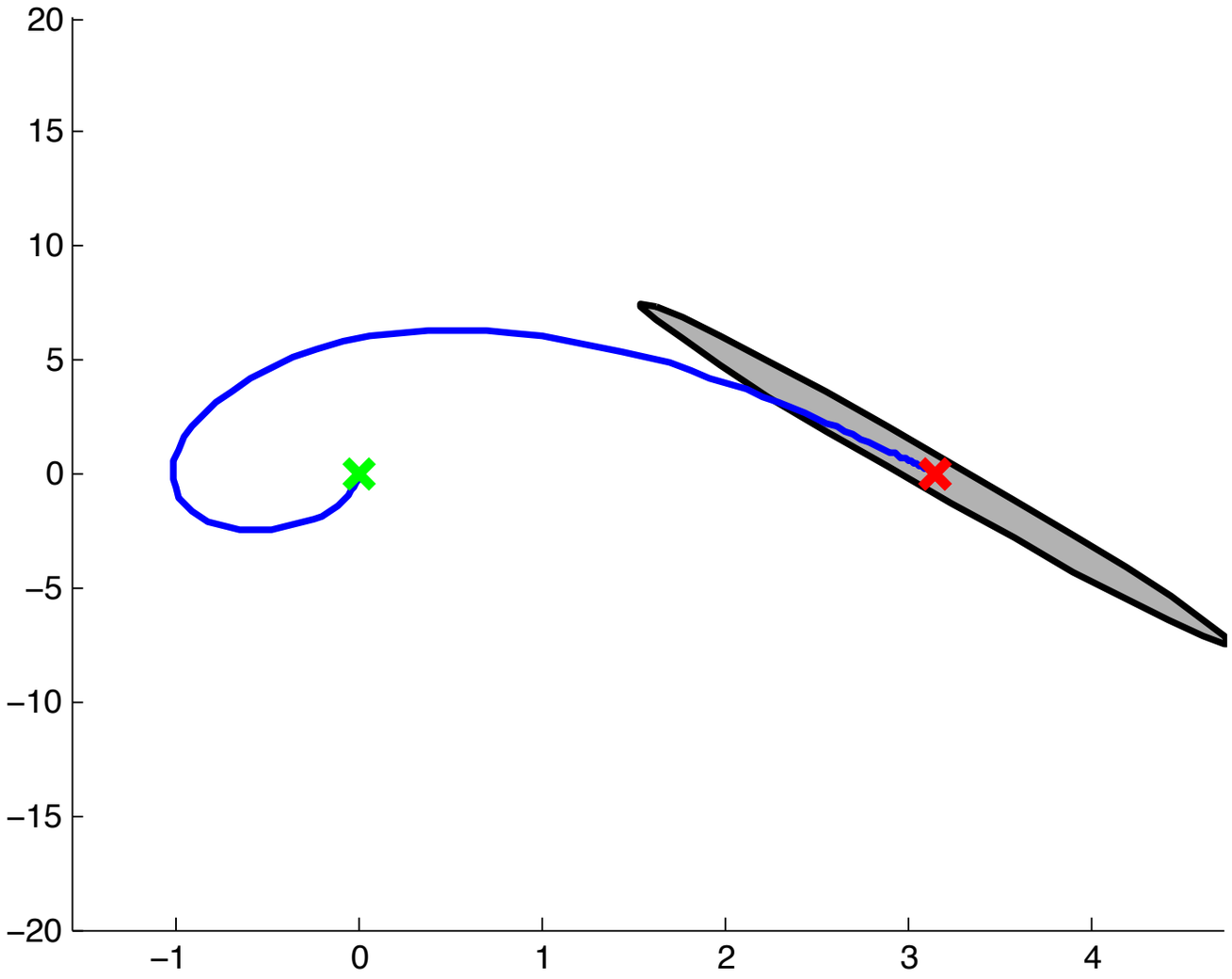
- Effectively solve many funnels along the trajectory (making sure that one dumps into the other) [Tobenkin10] .
- Stability not required (finite-time analysis)



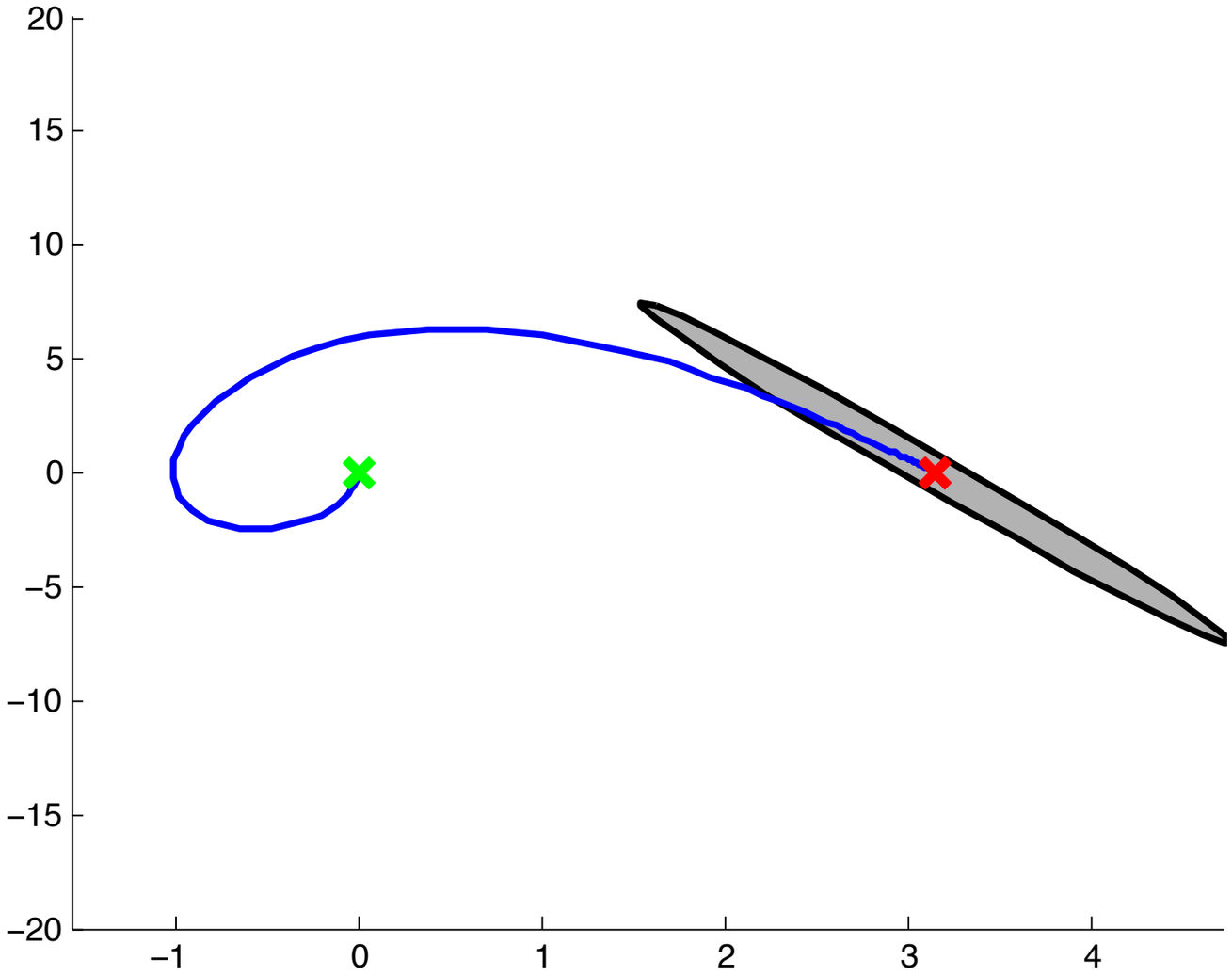


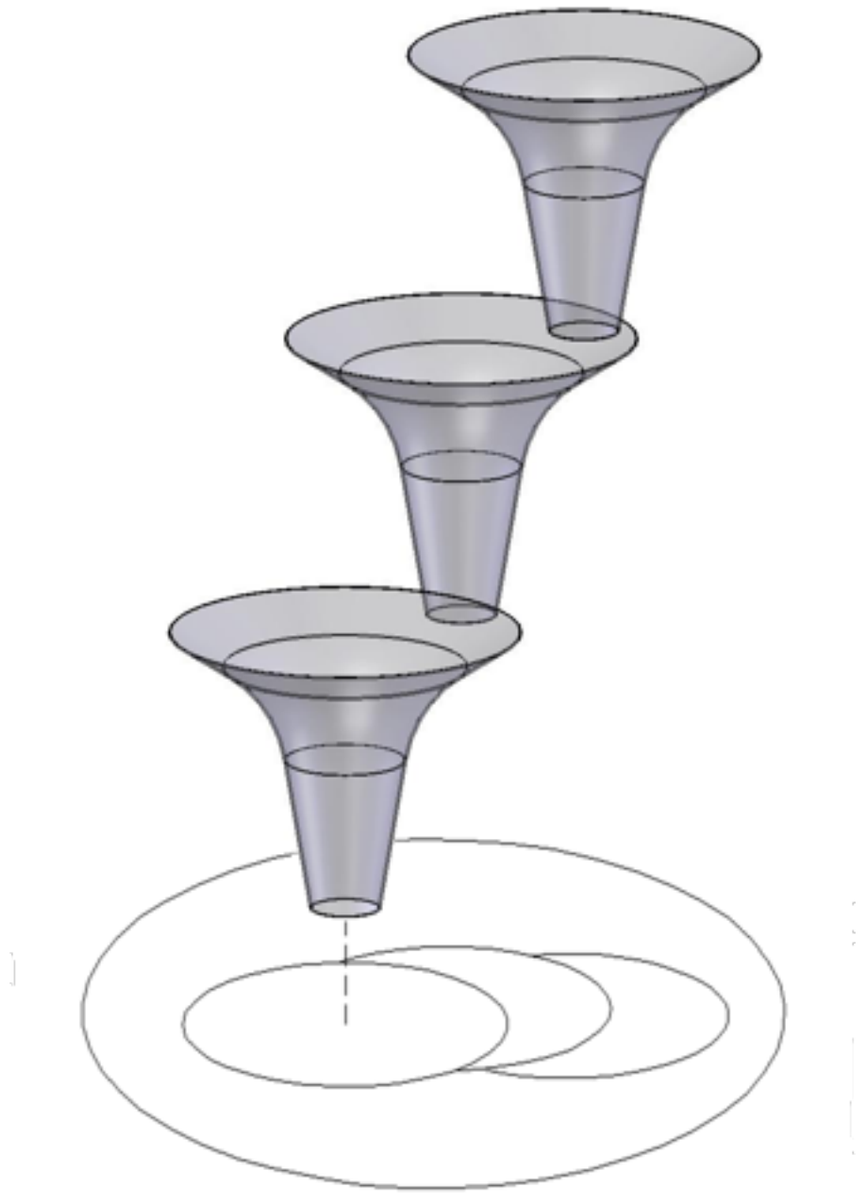
- Optimizing volume is more complex.

Pendulum “Funnels”



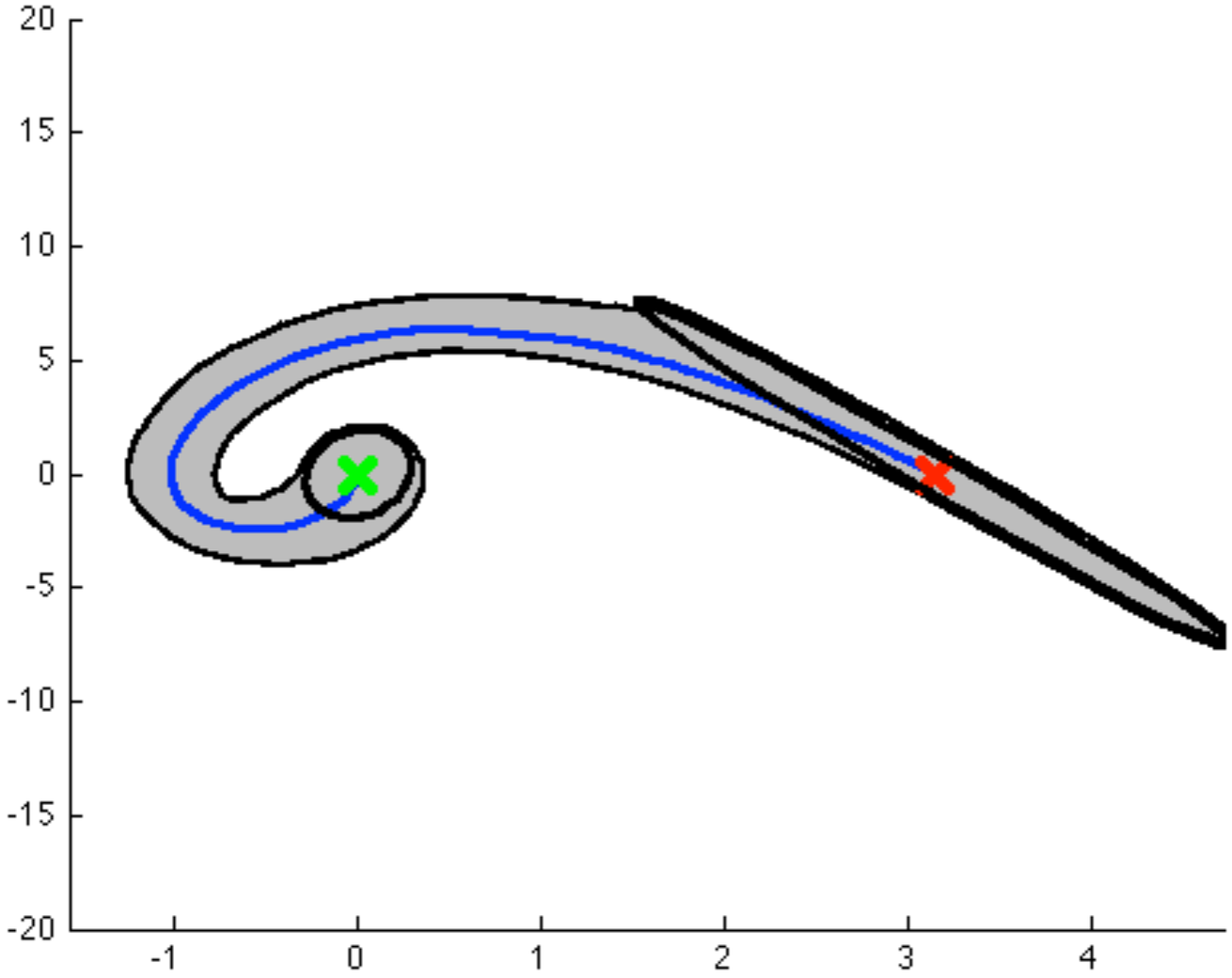
Pendulum “Funnels”

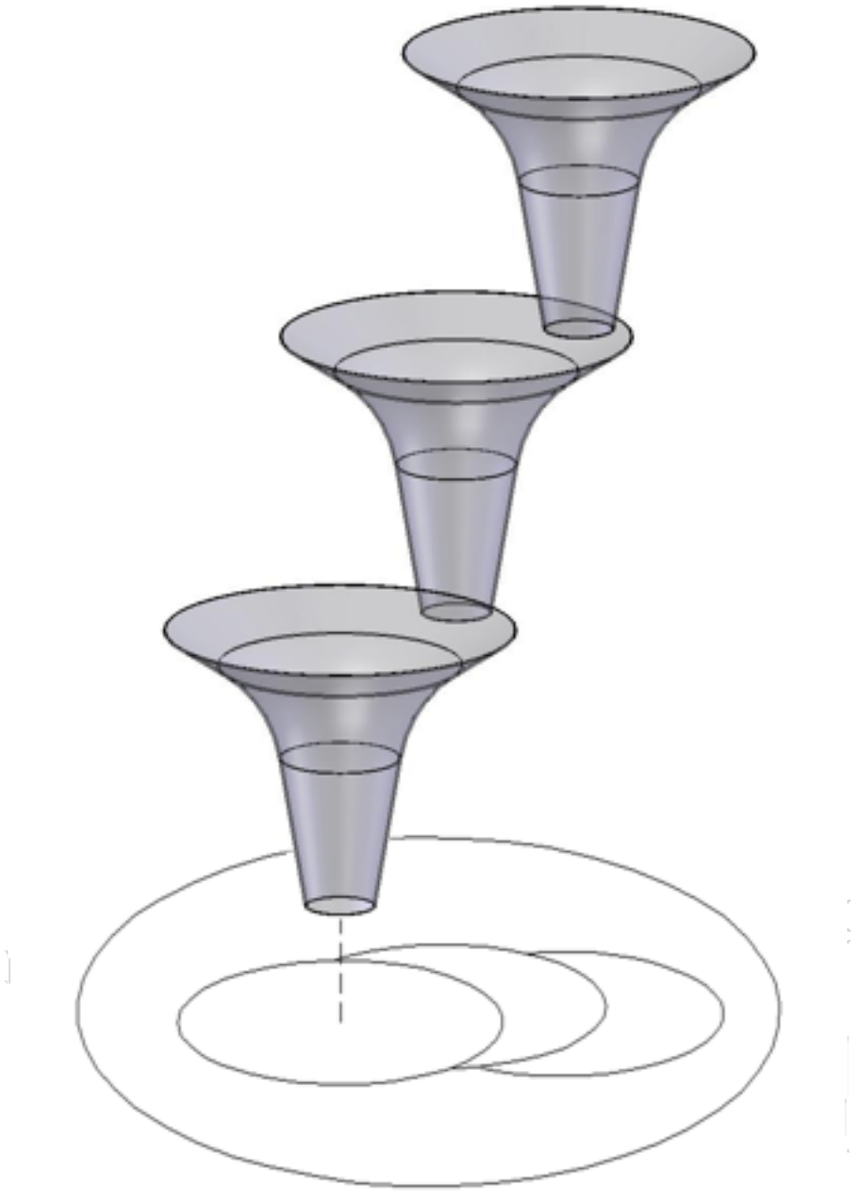




Erdmann, Mason, Rizzi, Koditschek

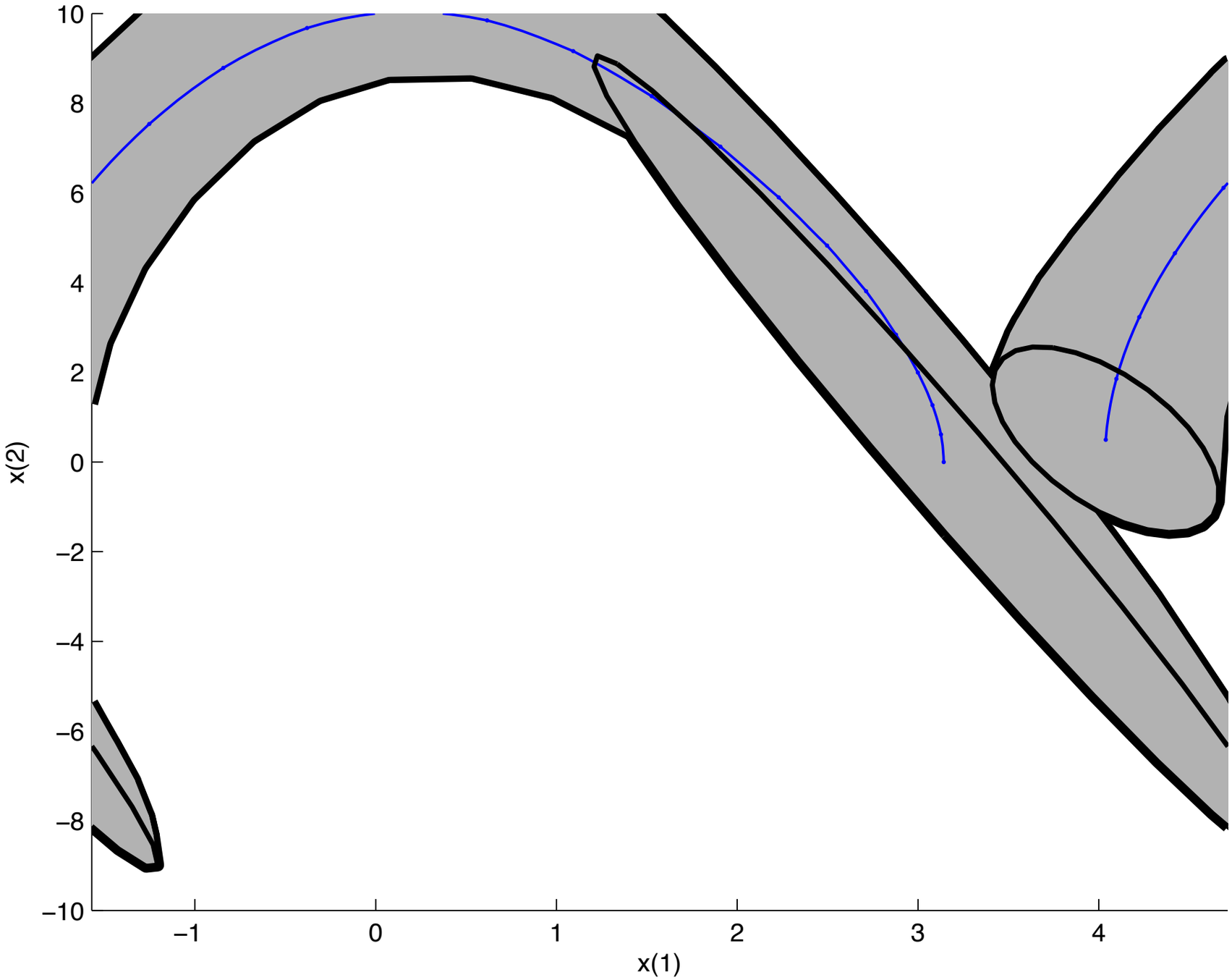
Pendulum “Funnels”



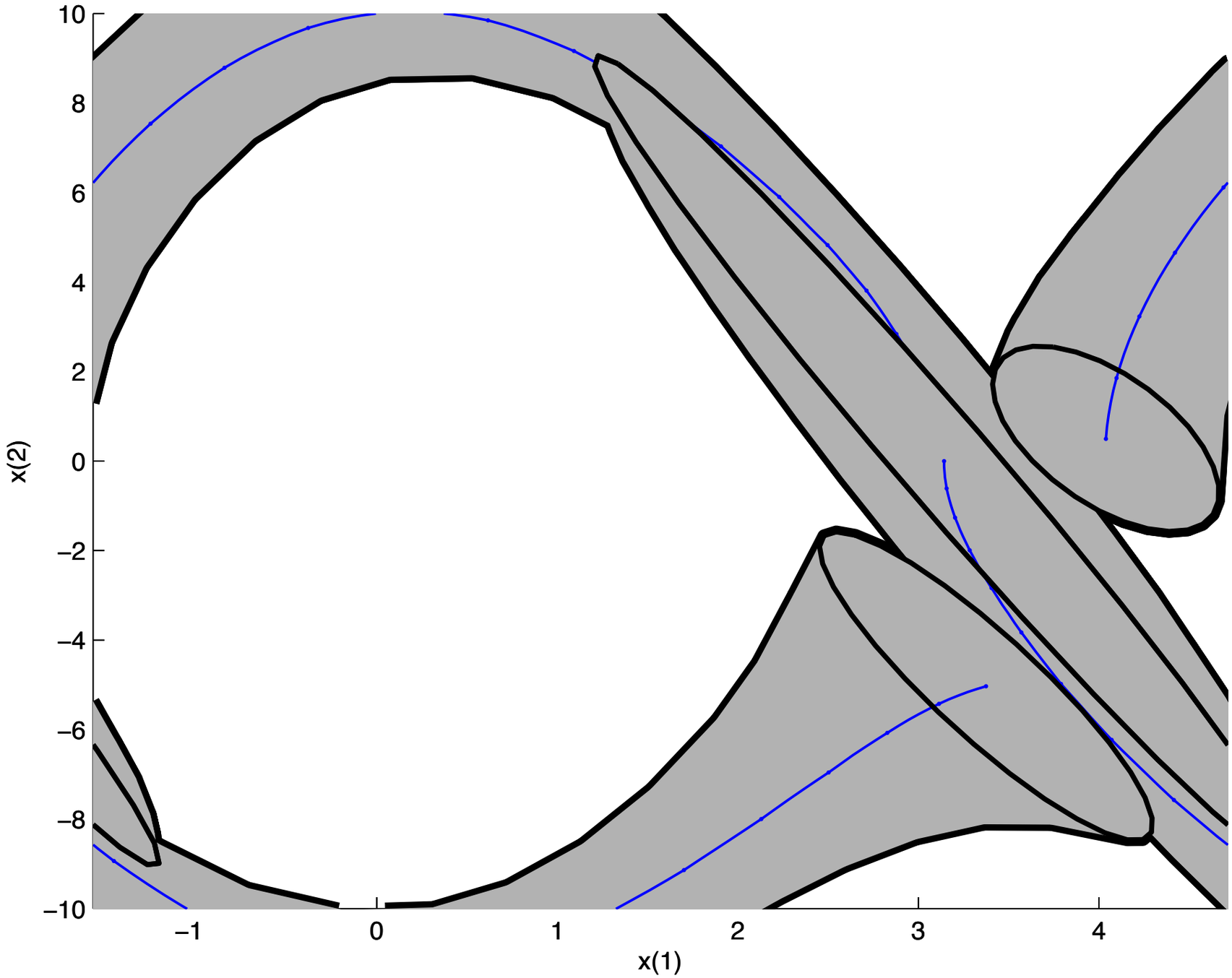


Erdmann, Mason, Rizzi, Koditschek

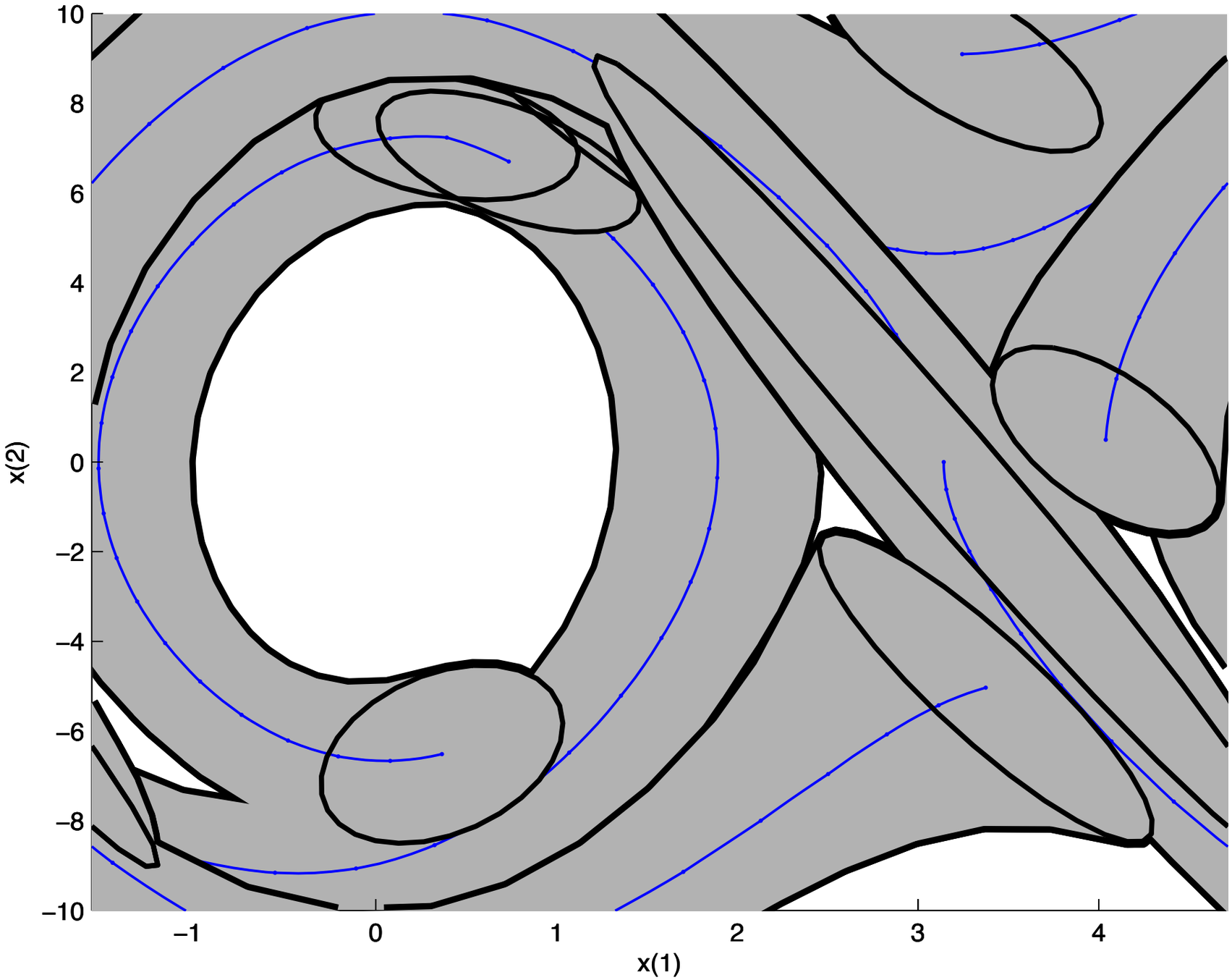
The “LQR-Trees” Algorithm



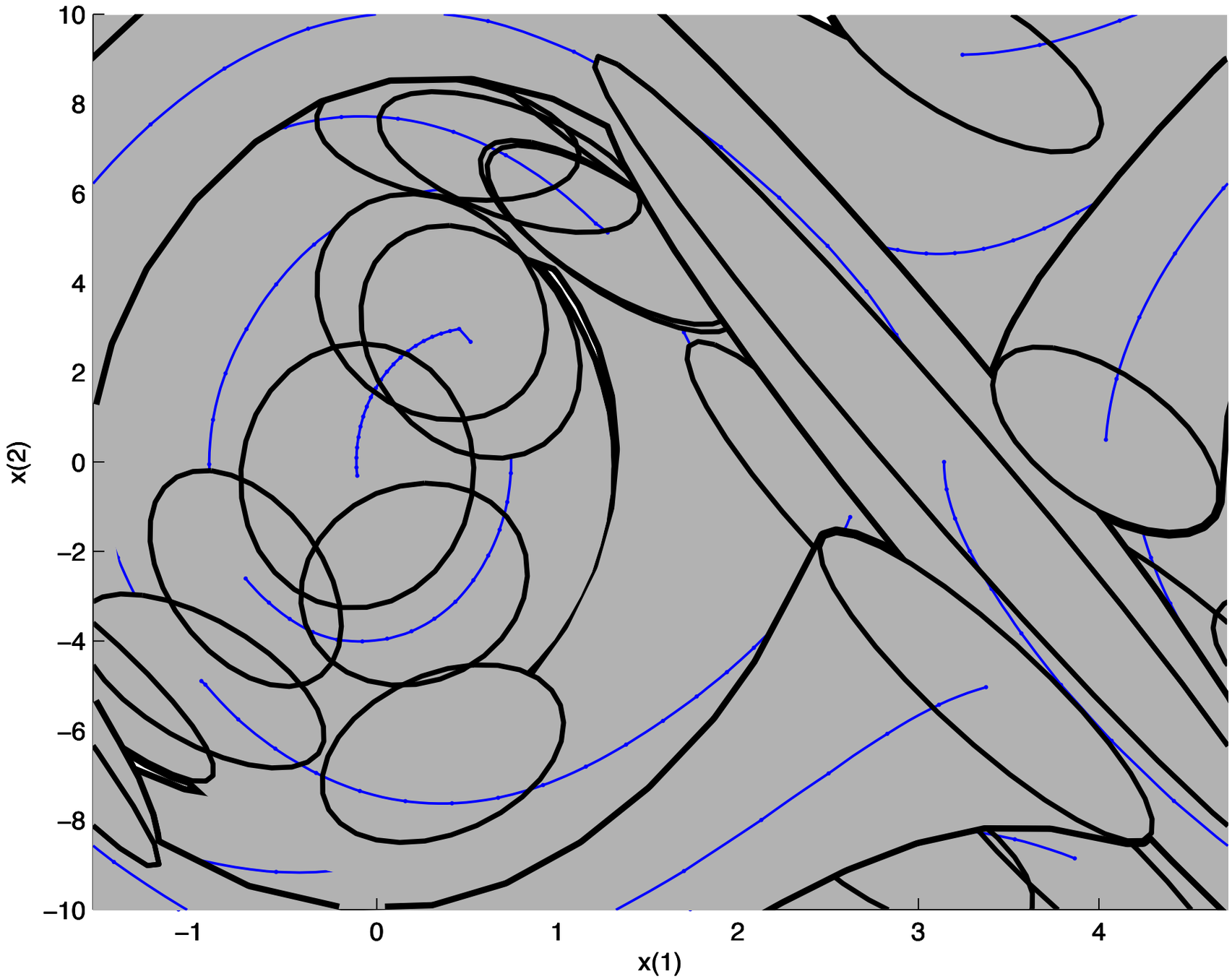
The “LQR-Trees” Algorithm



The “LQR-Trees” Algorithm



The “LQR-Trees” Algorithm



Probabilistic Feedback Coverage

Probabilistic Feedback Coverage

- Probabilistically covers reachable space with stabilizing controller

Probabilistic Feedback Coverage

- Probabilistically covers reachable space with stabilizing controller
  - Any finite measure region in the controllable set that is not in a funnel will be sampled and added to the tree

Probabilistic Feedback Coverage

- Probabilistically covers reachable space with stabilizing controller
  - Any finite measure region in the controllable set that is not in a funnel will be sampled and added to the tree