

# ECGR4161/5196 – Lecture 2 – May 29, 2012

## Viewed the following Lab 0 videos:

Brant/Meeks: <http://www.youtube.com/watch?v=z7YpEHkh65g>

Carpenter/Rhodes: <http://www.youtube.com/watch?v=NBLEvTLq6hU>

Chou/Myers: <http://www.youtube.com/watch?v=mQsINPW20Tg>

Collins/Morgan: <http://www.youtube.com/watch?v=hQlyzwkS98s>

De Los Santos/Salazar: <http://youtu.be/qc7-JLiDqJs>  
<http://youtu.be/YPzAQ9mrLiw>

Doan/Kachlan: <http://youtu.be/rBhhqfTWVh0>

Finnie/Hunter: [http://www.youtube.com/watch?v=e7AwJ\\_DOfnY](http://www.youtube.com/watch?v=e7AwJ_DOfnY)

Hill/Kuruvila: <http://www.youtube.com/watch?v=PG7iHXbs9y8>

Moster/Wesley: <http://www.youtube.com/watch?v=-aNQZhm1zA>

O'Leary/Woytisek: <http://www.youtube.com/watch?v=s3I6f1IudYQ>

Smith/Taylor: <http://www.youtube.com/watch?v=7huAfGoMPtM>

## Other YouTube videos

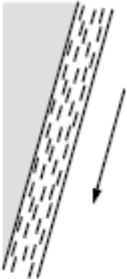
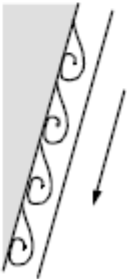





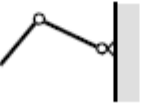

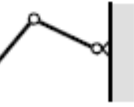


- PARO “Baby Harp Seal Robot(?)”  
<http://www.youtube.com/watch?v=oJq5PQZHUI&NR=1&feature=fvwp>
- LegoMindstorm – Rukic’s Cube solver:  
<http://www.youtube.com/watch?v=3QOvEG27Gt4>
- Honda robotics:  
[http://www.youtube.com/user/Honda?feature=pyv&ad=4612975284&kw=robot#p/u/0/AF0WsvfG\\_nl](http://www.youtube.com/user/Honda?feature=pyv&ad=4612975284&kw=robot#p/u/0/AF0WsvfG_nl)
- Tree climbing robot:  
[http://www.youtube.com/watch?v=zmqDePXM89Y&feature=player\\_embedded](http://www.youtube.com/watch?v=zmqDePXM89Y&feature=player_embedded)

# Locomotion

From our book:

- Legs
- Wheels
- Aerial

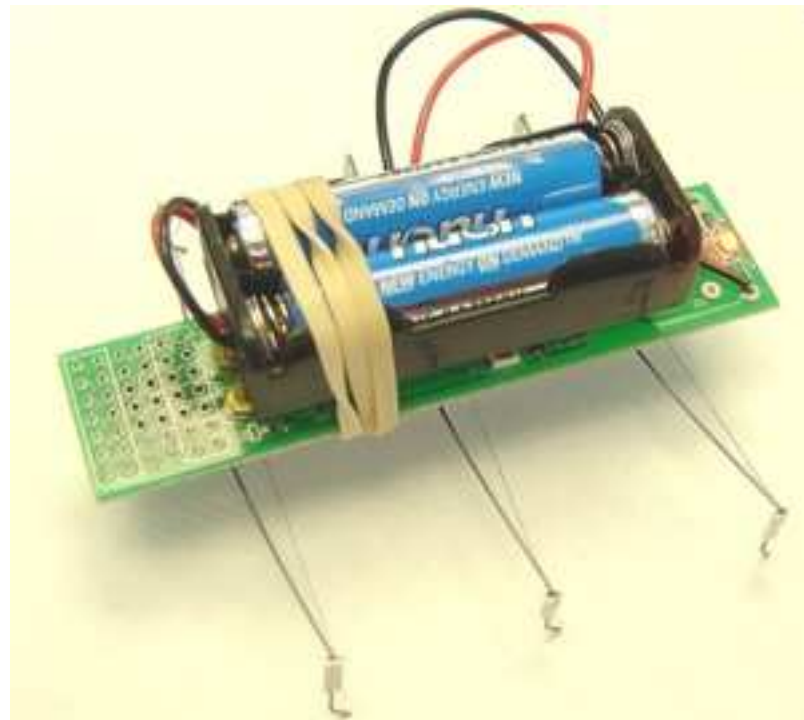
Missing is underwater, slithering, climbing, treads, others?

Type of motion	Resistance to motion	Basic kinematics of motion
Flow in a Channel 	Hydrodynamic forces	Eddies 
Crawl 	Friction forces	Longitudinal vibration 
Sliding 	Friction forces	Transverse vibration 
Running 	Loss of kinetic energy	Oscillatory movement of a multi-link pendulum 
Jumping 	Loss of kinetic energy	Oscillatory movement of a multi-link pendulum 
Walking 	Gravitational forces	Rolling of a polygon (see figure 2.2) 

# Legged Locomotion

Example – Walking Insect - Stiquito

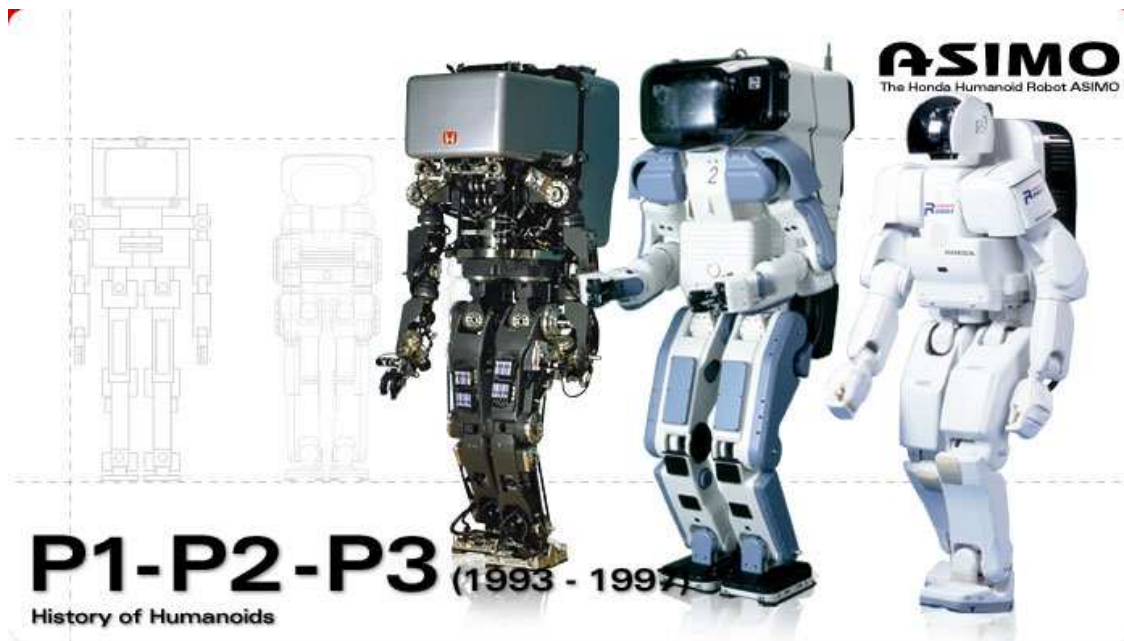
- YouTube video of Stiquito Controlled:  
<http://www.youtube.com/watch?v=znPM2Ssb920>
- Consider the gait, and control of these gaits.



# Legged Locomotion

Example – Humanoids:

- Consider balance, the gaits, and control of these gaits



[http://world.honda.com/ASIMO/history/p1\\_p2\\_p3.html](http://world.honda.com/ASIMO/history/p1_p2_p3.html)



<http://www.sonyaibo.net/aboutgrio.htm>