

LAWRENCE TECHNOLOGICAL UNIVERSITY  
**ROBOFEST**

**Hexapod (6 legged)  
Robot Sumo Rules  
for IEEE competition**

**Oct 11, 2011**

**6pm ~ 7:30pm**

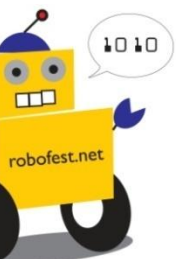
**Henry Ford Museum**

**Little Robots, Big Missions**  
Autonomous Robot Competitions for Every Student



# Robot Construction

- Using only parts provided by the BIOLOID kit
- Note that tapes are not included in the box
- Each robot needs an ID tag with team name – tapes can be used only for the ID tag
- Even if there is no penalty of losing parts, it is highly recommended to tighten all the screws



# The Ring

Line shape,  
length, and color  
are unknown

4ft (**1.5" raised**)

Line shape,  
length, and color  
are unknown

3.5ft

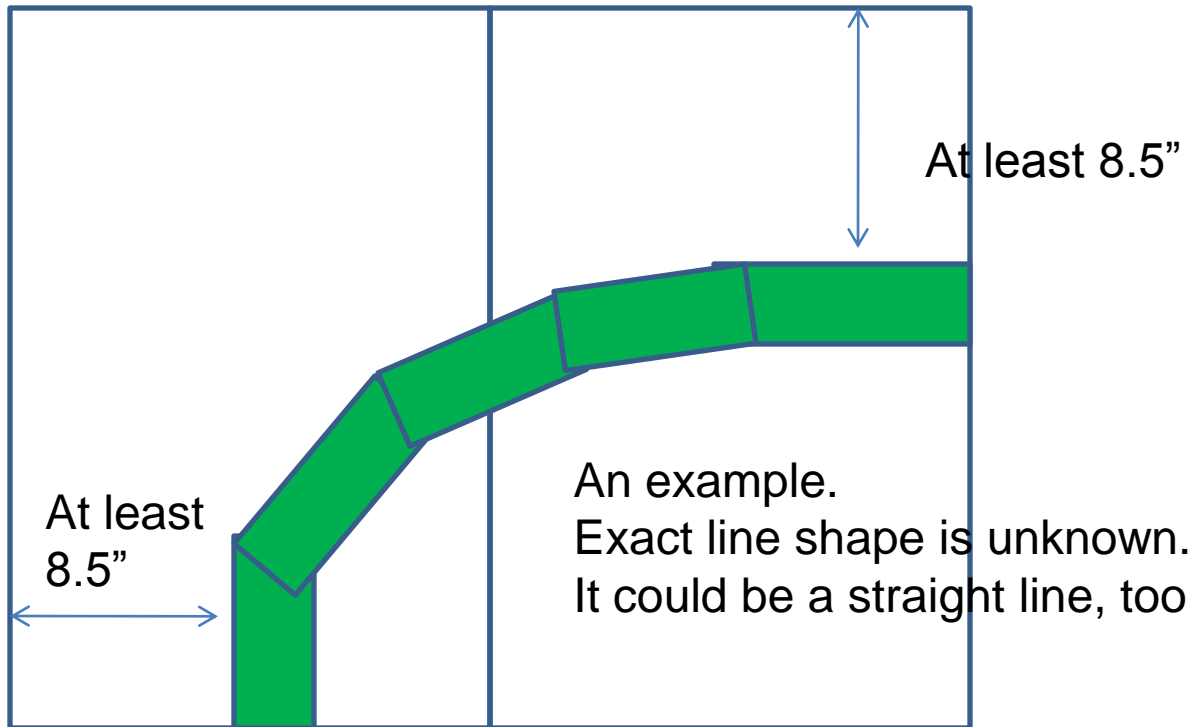
Construction manual  
of this octagon ring -  
go to  
[www.robofest.net](http://www.robofest.net) and  
click on Hexapod  
RoboSumo link

The robot orientation  
will be unknown



# How to make the lines

- Two white boards and green color papers  
[http://www.officedepot.com/a/products/628941/Wausau-Astrobrights-Bright-Color-Paper-8/?cm\\_cat=2000000411](http://www.officedepot.com/a/products/628941/Wausau-Astrobrights-Bright-Color-Paper-8/?cm_cat=2000000411)
- The width of the line will be 4.25 inches (tentative)



# The ring – An example



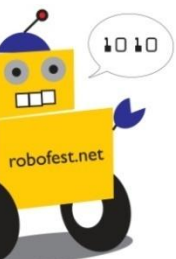
# Rules

- Objective is to survive inside the octagon ring until 2 minutes expire
- A match consists of up to 3 games
- 2 minutes for each game
- A robot loses a game,
  - if 3 legs touch floor after climbing up the ring (*and the opponent is on the ring*),
  - If the robot is touch by the team human player, or
  - **If the robot lays down on the ring for more than 2 seconds (New!)**



# How to start the game (1)

- The judge will decide the starting side (west or east) at random.
- The judge will tell the exact location and starting orientation of the robot. (The IR sensor facing down will be on the line)



# How to start the game (2)

- Judge will give the signal to start the robot.
  - Human player will start the robot by pressing **the start** button. Teams are *\*not\** allowed to press the start button before the judge says “go”
  - There must be some delays before starting the walking.
- After starting the robot each human player must move at least 6ft away from the ring





# Definition of successful climbing up the ring

- All 6 legs must be on the ring. (Black edge area is fine)



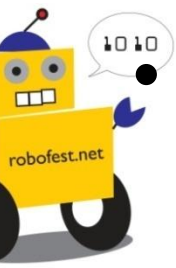
# Tie Breakers

- Who successfully climbed up the ring first?
- Rematch without line following, if all 3 games are ties (For this case, teams need to prepare a program for sumo only without line following part)



# FAQs (1)

- Can a robot attack the opponent robot while it is climbing up the ring? **Yes. The robot that can follow the line and climb the ring quickly has higher chance of winning**
- Both robots could not climb up the ring for 3 games. How do we decide winners? **Rematch without line following. Judges will decide the initial orientations. Need to re-download sumo only program**
- Do we allow a robot to re-climb up the ring?  
**No**



# FAQs (2)

- Robot A climbed up first, then fell off the ring by itself. Robot B was not able to be on the ring at all. Who is the winner? **Robot A**
- Robot A climbed up first, then fell off the ring by itself. Robot B was able to be on the ring later. Is it necessary to continue the game? **Yes.** Who is the winner? **Watch if B can stay until 2 min expire. If it does, B is the winner. If not A is the winner, since A climbed up first.**



# Acknowledgement

- Sponsor - ROBOTIS Inc.

# ROBOTIS

- Jinwook Kim, ROBOTIS Inc. - ideas about raised ring
- Gordon Stein – testing sumo programs for the first time and preparing instructions for sumo
- Joel Stein – construction of the octagon rings



