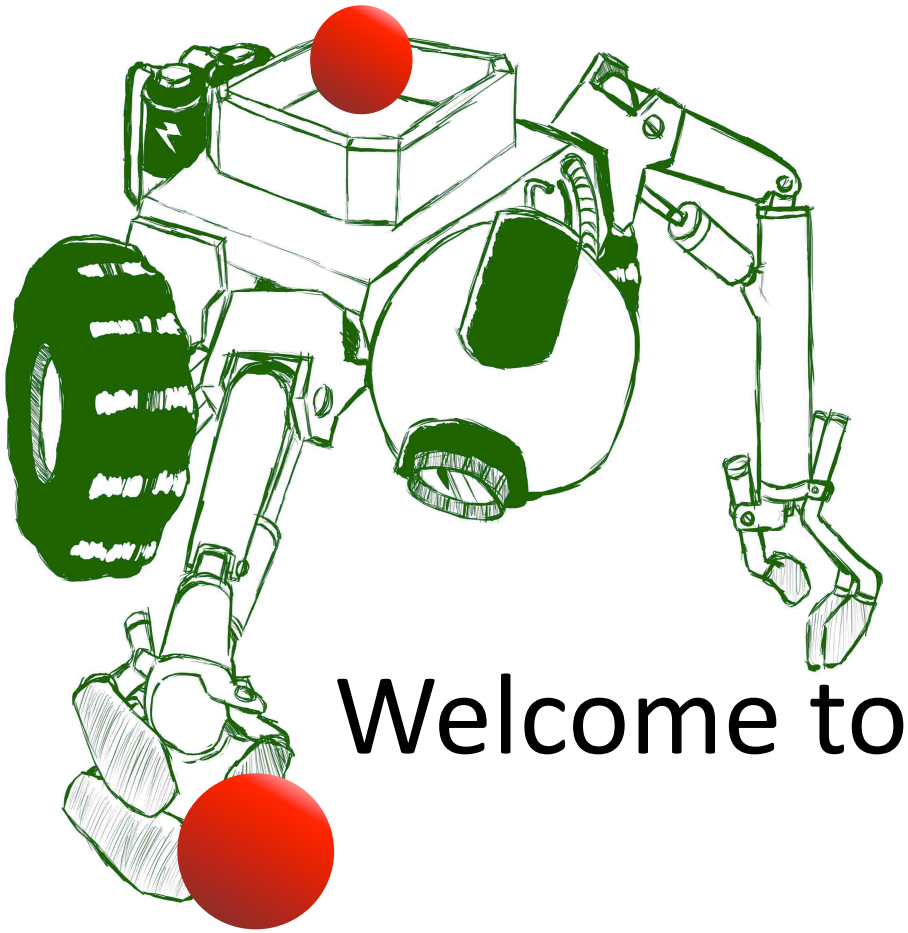


Welcome to Maslab 2011!

Lecture 0

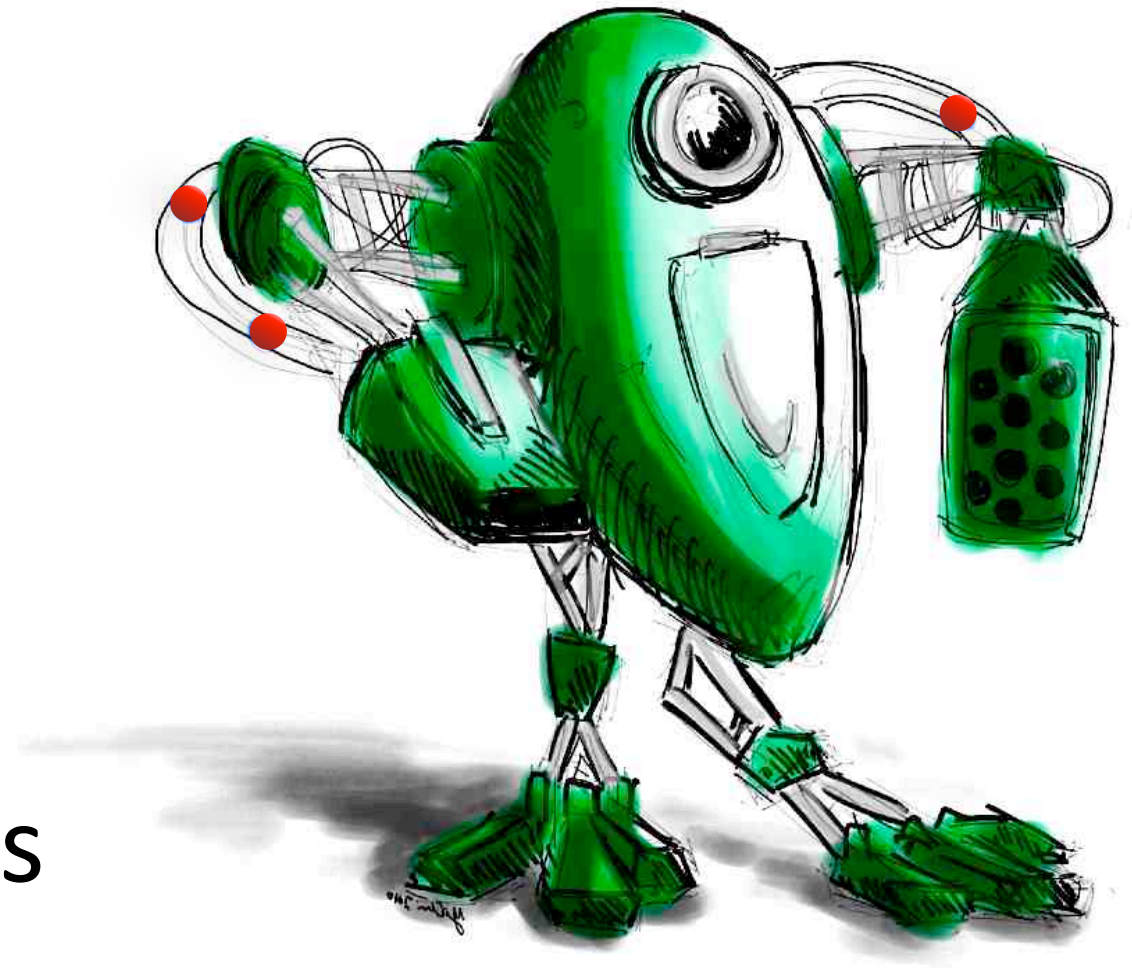
Ellen Chen

12/08/2010

Outline

- Organizational Tasks
  - Collect Checks
    - Checks payable to: Massachusetts Institute of Technology
    - In the memo put: Maslab Account 2734202
  - MIT numbers and T-shirt sizes
- Syllabus
- Game Rules
- The Kit
- Resources
- Q&A

Syllabus



Maslab 2011 Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Pre-IAP Activities						1 Staff Setup Day
2 Staff Setup Day	3 First Day Lectures 1, 2, 3 (noon-4) Edgerton Shop and Laser Training Checkpoint 1 (due by 10pm)	4 Lecture 4, 5 (noon-3) Checkpoint 2 (due by 10pm) Edgerton Shop and Laser Training Resumes Due	5 Lecture 6,7 (noon-3) Checkpoint 3 (due by 10pm)	6 Checkpoint 4 (due by 10pm)	7 Checkpoint 5 (due by 10pm)	8
9	10 Mock 1 – Checkpoint 6 (noon-5)	11 Guest Lecture TBD	12 Guest Lecture TBD	13 Guest Lecture TBD	14 Mock 2 (noon-2) Checkpoint 7 (2-5)	15
16	17 MLK	18	19 Mock 3 – Checkpoint 8 (noon – 5) Sponsor Dinner (6-8)	20	21	22
23	24	25 Mock 4 - Seeding (noon-4)	26	27 Impounding (5 - 10pm)	28 Pick up Robot (10am) 26-100 open (10am-9pm) Final Competition (3-8)	29 Cleanup Day (noon-4pm) Maslab Staff meeting (4pm)
30	31 Final Papers and Exit Surveys Due (11:59pm)					

Class Requirements

- Attend lectures
- Write in your team journal on the wiki daily
- Complete all 8 checkpoints
- Attend mock competitions
- Attend sponsor dinners
- Write a 5-7 page paper summarizing your team experience
- Complete your team assignments
- Attend Seeding and Final Competition
- Do the majority of your work in lab

Lectures

- Staff Lecture
  - Intro
  - Sensors
  - Strategy/Mechanical
  - Vision
  - Software Architecture/Threading
  - Controls
  - Behavior
  - Navigation
- Guest Lectures
  - TBD

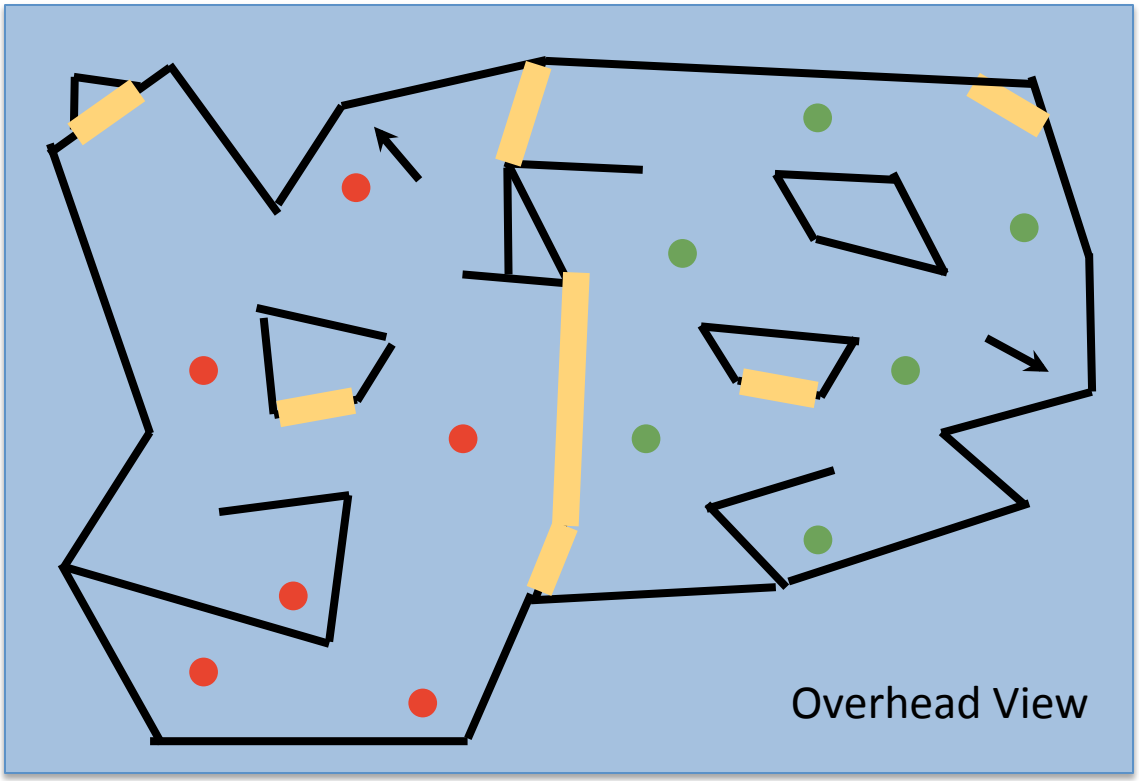
Additional Team Assignments

- Cleanup lab
- Mock Contest Setup
- Mock Contest Teardown
- Sponsor Dinner Setup
- Sponsor Dinner Teardown
- Contest Teardown

Game Rules

Game Rules

- Two robots on the field at the same time (3min per run, 2 runs)
- Collect colored balls and score
- Each side will have a different colored ball (red or green)
- SCORING
  - Over Yellow Walls
  - Into Yellow Goals



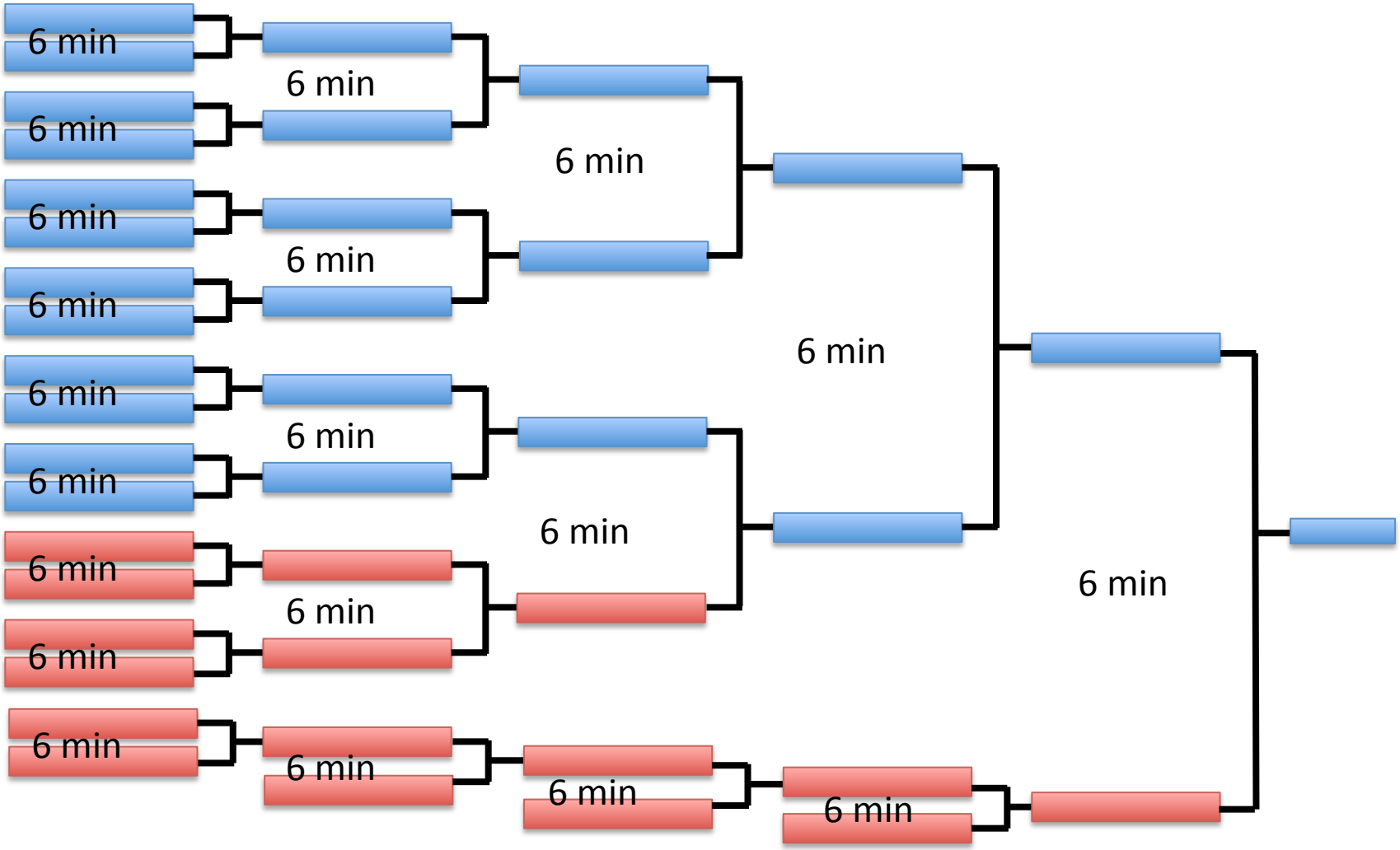
Scoring

Front View

- Possession of your color ball = +1
- Porch of your color ball within 12” of the goal = +2
- Your color ball in your goal = +4
- Possession, porch or scored other color ball = 0
- Your color ball on opponents side = +6
- Balls you put outside the field of play = -1
- ALL POINTS ASSESSED AT END OF ROUND
- Team with highest score (sum of 2 runs) advances

Note: Score values are subject to change, all students will be notified of changes

Bracket Structure



Double Elimination

Total contest time ~ 2 hours

Seeding

- 3 days before the final competition
- Seeded against a stationary robot
- Seeding determines who you will play against: higher ranked robots will play against lower ranked robots.
- Ties will be broken as follows:
  - 1. Team that moves the most balls advances
  - 2. Team that seeds highest advances
  - 3. Team with the lightest robot advances.

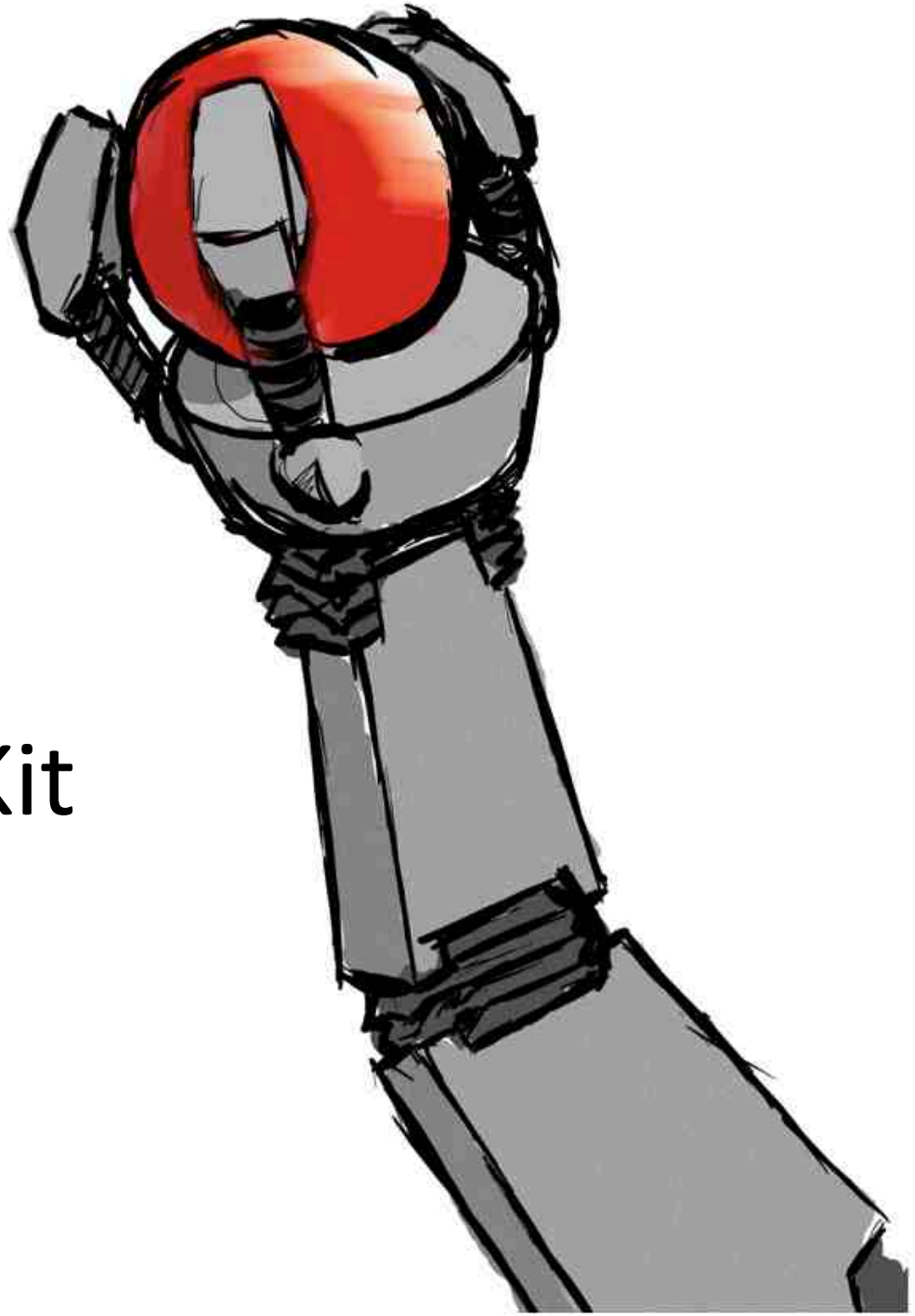
Robot Requirements

- Footprint restricted to 14”x14”
- 30 Sensor Points
- 1 Camera
- Limit on additional funds $100
  - Provided by your team.
  - Additional allowances for battery and motor replacements.
- Totally Autonomous
- Start with one of two push buttons (color selection)
- Must stop at when time is up automatically

What's the best strategy?

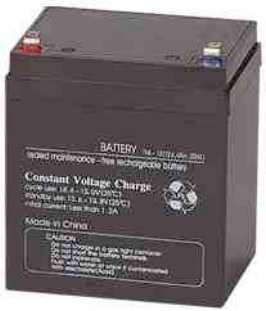
- Something to think about:
- Score only in goals?
  - Safe but fewer points.
  - What about balls lobbed over by other team?
- Score only over walls?
  - Dangerous, other team can lob balls back.
  - What about dumping balls at the last second?
    - Dangerous, what if you can't find the wall?
    - What if you don't have the ball capacity for your balls AND your opponents balls?
- Score using both methods?

Maslab 2011 Kit



Maslab Hardware Kit

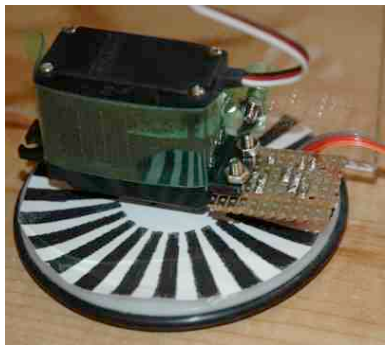
- 10.1” EeePC with Ubuntu (graphical desktop is disabled)
- uORC
- 2 Motor kits
- Batteries and chargers
- Peg board



Measure the major parts for your robot models!

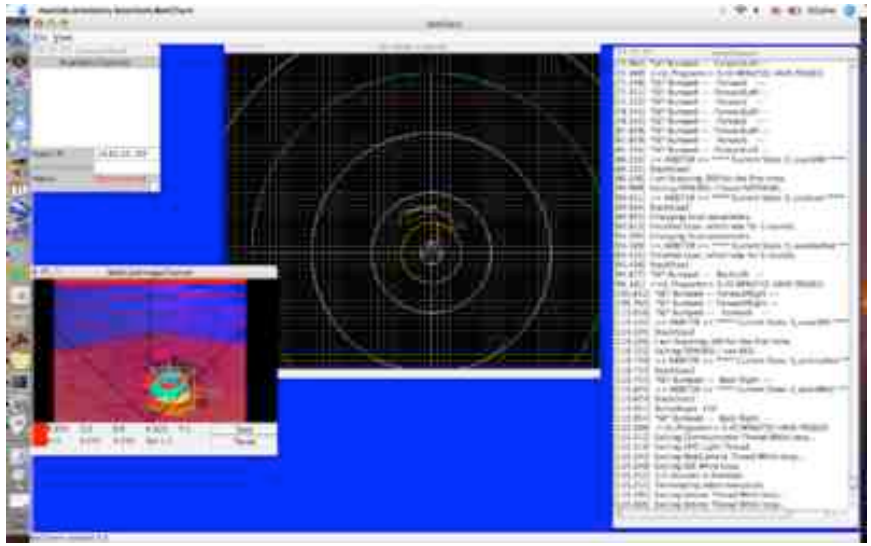
Maslab Hardware Continued…

- Camera
- Gyro
- Additional Sensors
  - IR range finders
  - Ultrasound
  - Encoders
  - Bump sensors
  - Etc.



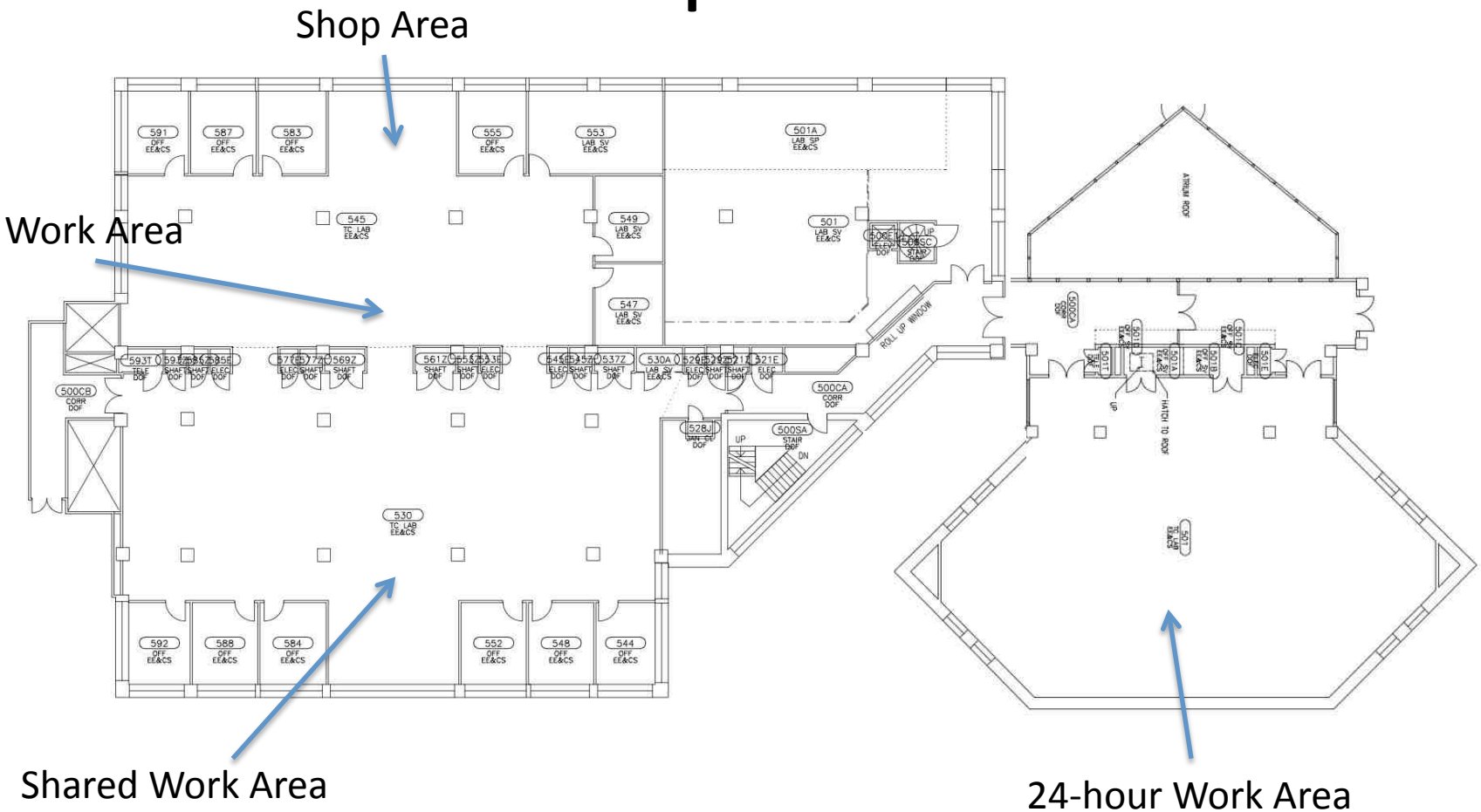
Maslab Software

- Maslab is run in Java
  - Orc.jar
  - Maslab.jar
- Staff can provide support for
  - Eclipse
  - SVN



Resources

Spaces



Building 38, 5th floor

Open noon-10pm weekdays

Building 34, 5th floor

Open 24 hours, no machining here!
Test field will be available here

Machining Areas

- Maslab Shop
  - Tools, scroll saw, small drill press, hand drills
  - Small shear, small sheet metal bender
- Edgerton Shop
  - One student in the team will be trained through Maslab
  - Bandsaw, Mills, Lathes, Drill Press, 3D printer, etc.
- Edgerton Laser Cutter
  - One student in the team will be trained through Maslab
- Hobby Shop
  - Requires individual membership
  - Waterjet, woodworking tools, etc.

What can we be doing before IAP?

- Familiarize yourself with the game
  - Read past wikis (see references section)
  - Familiarize yourself with the hardware limitations
- Learn to use software
  - Learn Java, Eclipse, SVN
  - Do vision tutorial (recommended), odometry tutorial
- Discuss strategy and design with your team
  - Learn Solidworks or other CAD program
  - Put together a schedule for IAP
  - Begin preliminary design of robot
  - Order custom parts for your robot (wheels, batteries, sensors…)
- Start personalizing your team wiki page!
  - http://maslab.mit.edu/2011/wiki/Maslab_2011

References

All References and Materials are Available on the 2011 Wiki!

- Tutorials
  - http://web.mit.edu/6.186/2009/tutorials/imagetutorial/ImageTutorial.pdf
  - http://web.mit.edu/6.186/2007/tutorials/odomtutorial/odomtutorial.pdf
- Wikis from past years
  - http://maslab.mit.edu/2007/wiki/Maslab_2007
  - http://maslab.mit.edu/2008/wiki/Maslab_2008
  - http://maslab.mit.edu/2009/wiki/Maslab_2009
  - http://maslab.mit.edu/2010/wiki/Maslab_2010
- Orcboard Specs
  - http://www.orcboard.org/wiki/index.php/Main_Page

Maslab 2011 Sponsors

Gold Sponsor

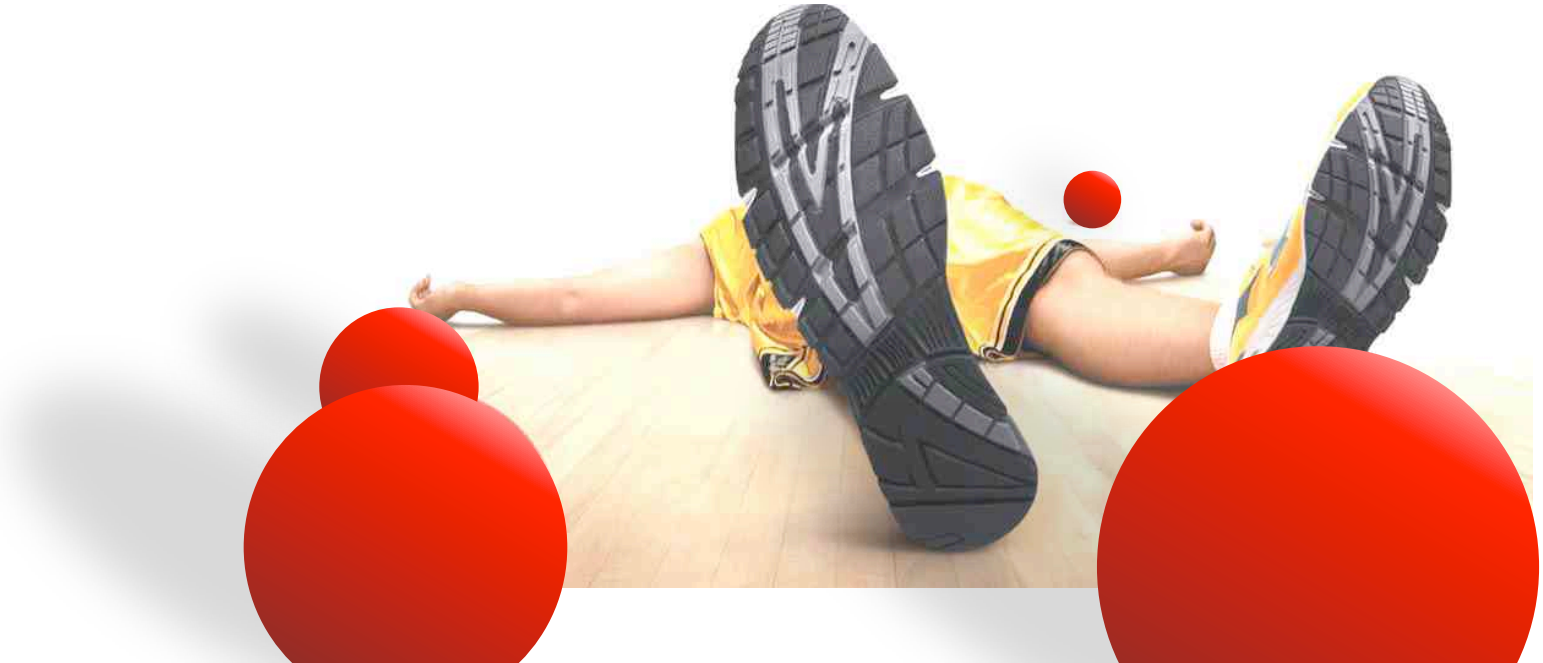
Silver Sponsors

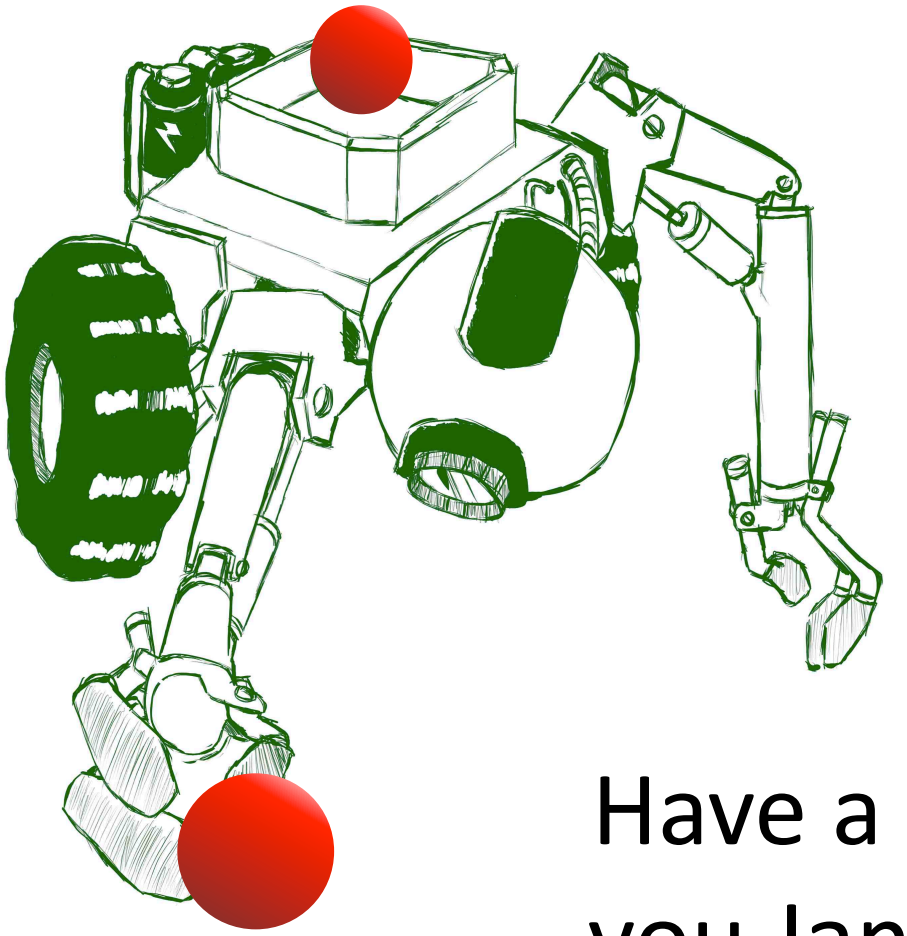
Equipment Sponsor

And More to Come!

Prepare a resume, sponsors are looking for interns and full time employees!

Questions?





Have a great break, see you January 3rd at noon in 32-155 (Stata)!