# RoborodentiaXII: Crossfire!

## Competition Rules and Course Specification:
**Version 1.2**

The object of the competition is to throw balls to the opponent's side of the court. This is a head-to-head double elimination style tournament where the robot with a higher final score wins a match. Each ball thrown over is worth one point. A robot's score for a match is the point total at the end of the match. The competition will be held during Cal Poly Open House, April 22nd 2006 on the Cal Poly campus and is organized and administered by the Cal Poly IEEE-Computer Society. The Computer Society can be contacted via email at ieee.cs.calpoly@gmail.com

Teams are required to register with the Cal Poly IEEE-Computer Society with their intent to compete in Roborodentia. Registration forms will be made available starting Wednesday, March 1, 2006 and must be received no later than Friday, April 7, 2006.

Note: Rules are subject to minor changes. Any changes will be announced.

### 1. Course Specifications (see attached diagrams for more details and dimensions)

1.1 The entire course is 6' wide x 8' long, with a thick wall down the center and walls around the edges.
1.2 Six lines in a box pattern are on each side. (Made using electrical tape)
1.3 Lines are equally spaced 1' apart, and 6" from a wall to the outer edge of the tape.
1.4 Eleven (11) balls are placed on each side at electrical tape intersections for a total of 22 balls.
1.5 The center wall 3" ledge will be painted green. All other walls and surfaces will be white. Exact paint color specification of center wall will be released at a later date
1.6 All balls are red and are the same size (Smash balls 1.5" in diameter, available from Big 5 Sporting goods)

### 2. Robot Specifications:

2.1 Robots must be fully autonomous and self contained.
2.2 Robots must be 12" x 12" x 12" or smaller at beginning of the match, but may autonomously expand after the match begins. At any point during a match, a robot should be no larger than 24" x 24" x 24".
2.3 A robot may consist of multiple discrete parts, but one button must start all parts. Multiple robots that touch will be considered 1 robot and are subject to rule 2.2 size restrictions as if it were a single robot. The total volume of all robots (when placed on the ground) should not exceed the 24" x 24" x 24" size restriction. Multiple robots are collectively considered a single robot in regards to penalties.
2.4 Robots may not have any RF wireless receivers/transmitters on board.
2.5 Robots may not damage the course.
2.6 Any projectiles are considered part of your robot. At the judges' discretion, unsafe

projectiles will not be allowed in the competition.

2.7 Contest balls are not considered part of a robot

2.8 A robot may not erect a stationary ball barrier(i.e. nets, walls, etc.) nor deploy a moving ball barrier separate of the collection vehicle.

2.9 Adhesives may not be used to pick up balls.

**3. Competition Regulations:**

3.1 A starting light will come on for 3 seconds signaling the start of a match. Contestants must start the robot while the light is on by pressing only 1 button 1 time. Contestants may not touch a robot during a match. Touching a robot ends the run for that robot.

3.2 On the day of the competition, there will be a seeding round to determine the tournament bracket. The seeding will occur as follows:

The robot will be set up alone in the course and must throw as many balls as possible over the wall in two minutes. The course will be set up in the same configuration as actual competition. In the event of a tie, the robot with the faster time will be seeded higher. If the times are the same, the first robot to touch a ball is seeded higher. Contest penalties also apply during seeding.

3.3 The tournament itself will be run in a double elimination format.

3.4 Each time a ball is successfully thrown, lands, and stays on the opposing side, a point is awarded.

3.5 A match will last 3 minutes.

3.6 If both teams agree, the match may end prior to three minutes. (ie. In event of both robots malfunctioning).

3.7 Balls in flight at the buzzer will be considered in the final score.

3.8 At the end of a match, the robot with more points wins that match.

**4 . Penalties:**

4.1 If a contest ball goes off the course, the throwing robot receives penalty points equal to the value of the ball. These points will be subtracted from the final score. The ball will then be placed on the side opposing the throwing robot. The ball will be placed in the center of the back line, between lines 3 and 4.

4.2 Contest balls must be propelled with either an initial upward trajectory or be propelled by gravity. A robot which propels contest balls with an initial downward trajectory, except by gravity, will be disqualified for that match.

4.3 If a robot elevates or propels contest balls more than 3 feet vertically into the air, the robot will be disqualified for the match.

4.4 A robot may not break the vertical plane of the center wall face nearest the robot, as shown in the diagram. Crossing the plane will result in disqualification for that match.

4.5 If a robot is found to possess more than five balls at the same time during a match, the robot will be penalized 12 points. Possession is defined as lifting the ball off the ground or preventing a ball from leaving your robot's control. This penalty will be assessed at most once for each robot per match.

4.6 A robot that attempts to damage an opponent's robot will be disqualified for that match.
4.7 If the robot scores more than 60% of its total match points in the last minute of a match, it will not receive credit for **those** points. If a robot scores 10 or fewer total points in a match, this rule does not apply.

## 5. Tie breakers

In the event of a tie, the following tie breakers (listed in order below) will be used to determine a winner:

1. whichever robot had a higher score at 2 minutes
2. whichever robot had fewer penalty points
3. whichever robot was seeded higher

## 6. Contestant eligibility

Each entering team must meet 1 of the following requirements:

- Have at least one team member who is a Cal Poly student, alumni, or staff
- Have at least one team member who is a student member of the IEEE

## 7. Prizes

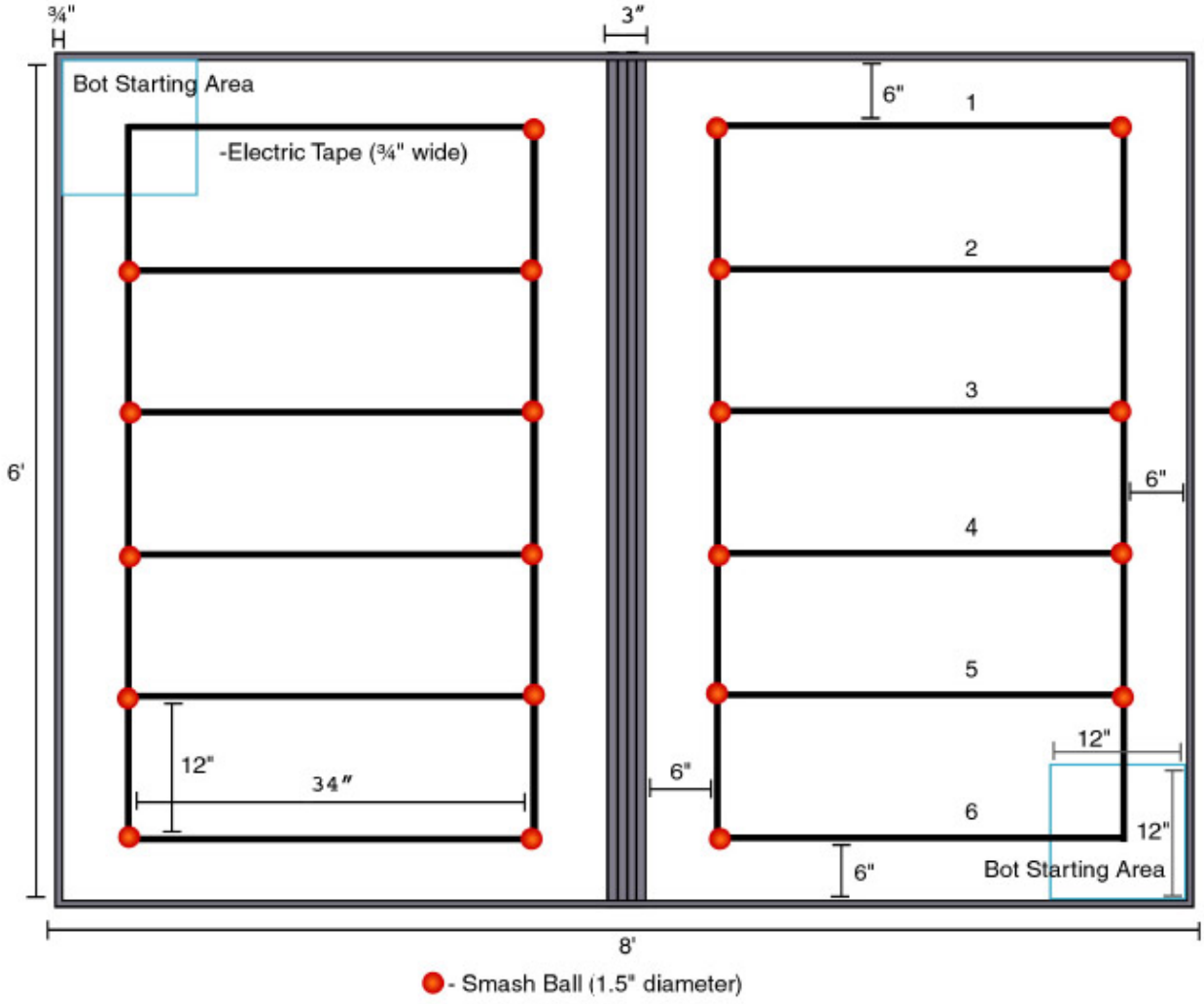
Below are the prize levels:
1st Place - $1,000
2nd Place - $600
3rd Place - $400

Additional awards may be offered, ie. Most Innovative Design, etc.(subject to funding)

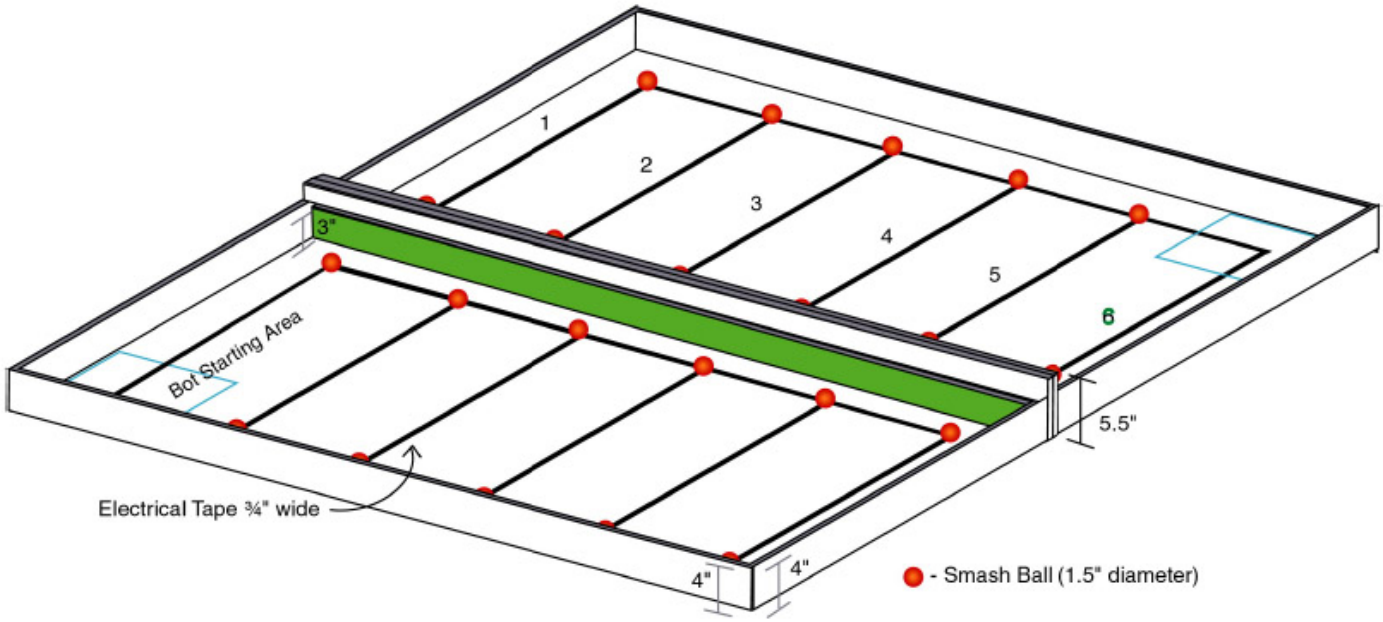
## Rules Changelog

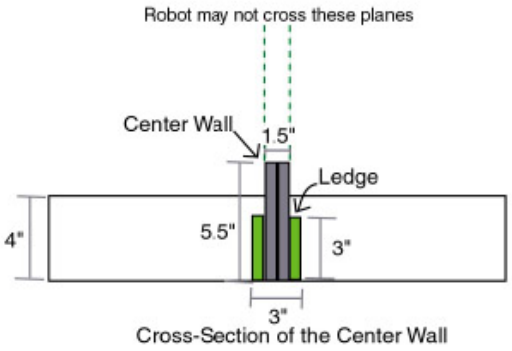
v1.1 (10/10/05)
- Added contestant eligibility rules
- Added rule restricting use of RF wireless
- Changed tape width to 3/4”
- Clarified scoring rules

v1.2 (1/17/06)
- Added adhesive ball pick up rule
- Changed wall width to 3/4”
- Added final minute – 60% penalty rule
- Added multiple robot size clarification
- Added registration requirement
- Added additional tie breaker




The course will be available for testing on the Cal Poly campus after March 27, 2006.




Cross-Section of the Center Wall