L^3

Locehilios LEGO League

Format for Competition L3-2006-01

"Ball Counting"

Draft 0.2

1 Competition

1.1 Identity

This competition will be identified as L3-2006-01.

1.2 Overview

The goal of this competition is to quickly and accurately count LEGO soccer balls. This challenge will have very few restrictions. Robots will need a way to accept a supply of soccer balls, process them in whatever way it wants, and then announce when it has an answer. Points will be awarded for precision and speed.

1.3 Format Summary

Type	Task
Autonomy	Autonomous
Size	*No restriction*
Weight	*No restriction*
Motor	*No restriction*
IR Usage	Allowed *
Processing	*No restriction*
Power	*No restriction*

* IR message ranges for each robot will be assigned prior to the competition.

1.4 Construction Requirements

1.4.1 Ball Receptacle

Robots must have a receptacle for receiving LEGO soccer balls. This receptacle must have a capacity to hold 350 balls.

1.4.2 Loaner LEGO Balls

100 LEGO soccer balls will be made available for each participant to test with. These need to be returned after the competition.

1.5 Task Details

1.5.1 Goal

The goal of the competition is to count a supply of soccer balls.

1.5.2 Loading

A robot will receive its load of soccer balls prior to being activated.

1.5.3 Starting

When a robot starts counting, a timer will begin. After the start, a robot may not be interfered with. It must complete the counting on its own.

1.5.4 Announcing Completion

A robot must announce when it is finished with its counting. This must be with an audible or visual signal (such as a beep).

1.5.5 Reporting

A robot must have a way to report its final count. It doesn't matter how this is implemented as long as the answer is clear to all observers.

1.5.6 Timing

Time to count will be measured in seconds. Timing begins the moment a robot is started. Timing ends the moment a robot announces its completion.

1.5.7 Faults

1.5.7.1 Conditions

The following will result in a fault.

1.5.7.1.1 Human Interference

During counting a robot may not be helped, moved, touched, etc.

1.5.7.1.2 Participant Forfeit

A participant may forfeit a round if they desire. A forfeit must be declared prior to their robot announcing completion.

1.5.7.1.3 No Reporting

If a robot proves unable to report its final count, it has faulted.

1.5.7.1.4 Timeout

If a robot's counting goes beyond 3 seconds per ball. So for counting 300 balls the limit will be 15 minutes.

1.5.7.2 Penalty

A robot will be penalized for faulting. For the round in which the robot faults, its point score will be 25% greater than the highest score of non-faulting robots.

1.6 Judging

1.6.1 Rounds

The competition will have 3 rounds. Each round will count for 1/3 of a robot's total score. Each round will have a different counting goal (number of balls). Goals will be randomly chosen on the day of the competition. At least one round will use a "low" goal (1-25), and at least one round will use a "high" goal (250 – 350).

1.6.2 Human Counting

Before each round the ball supply will be counted by at least two participants to ensure an accurate starting count.

1.6.3 Additional Human Counting

A participant can request a recount of the ball supply if there is doubt about the accurate count.

1.6.4 Scoring

The focus of this competition is accurate counting. The secondary goal is speed of counting.

1.6.4.1 Precision

Precision will be measured by calculating the amount of error in a robot's count. error = abs(g-c)/g Error levels will be normalized across all robots and then multiplied by 100. This will be the number of points awarded for a robot's error level.

1.6.4.2 Time

Time will be measured in seconds. Times will be normalized across all robots and then multiplied by 100 and by a factor of 0.25. This will be the number of points awarded for a robot's time. The 0.25 factoring is to lessen the weight given to the time portion of scoring.

1.6.4.3 Final Score

Final scores will be the addition of points awarded for each round. The robot with the least points will win the competition.

1.6.4.4 Score Sheet

A scoring sheet, L3-2006-01.xls, will be provided to all participants so they may familiarize themselves with the scoring.