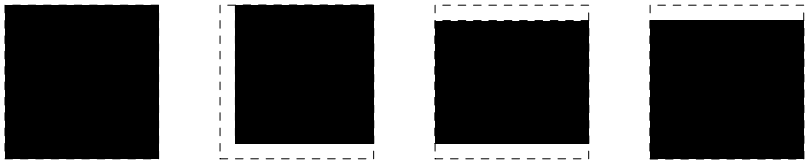
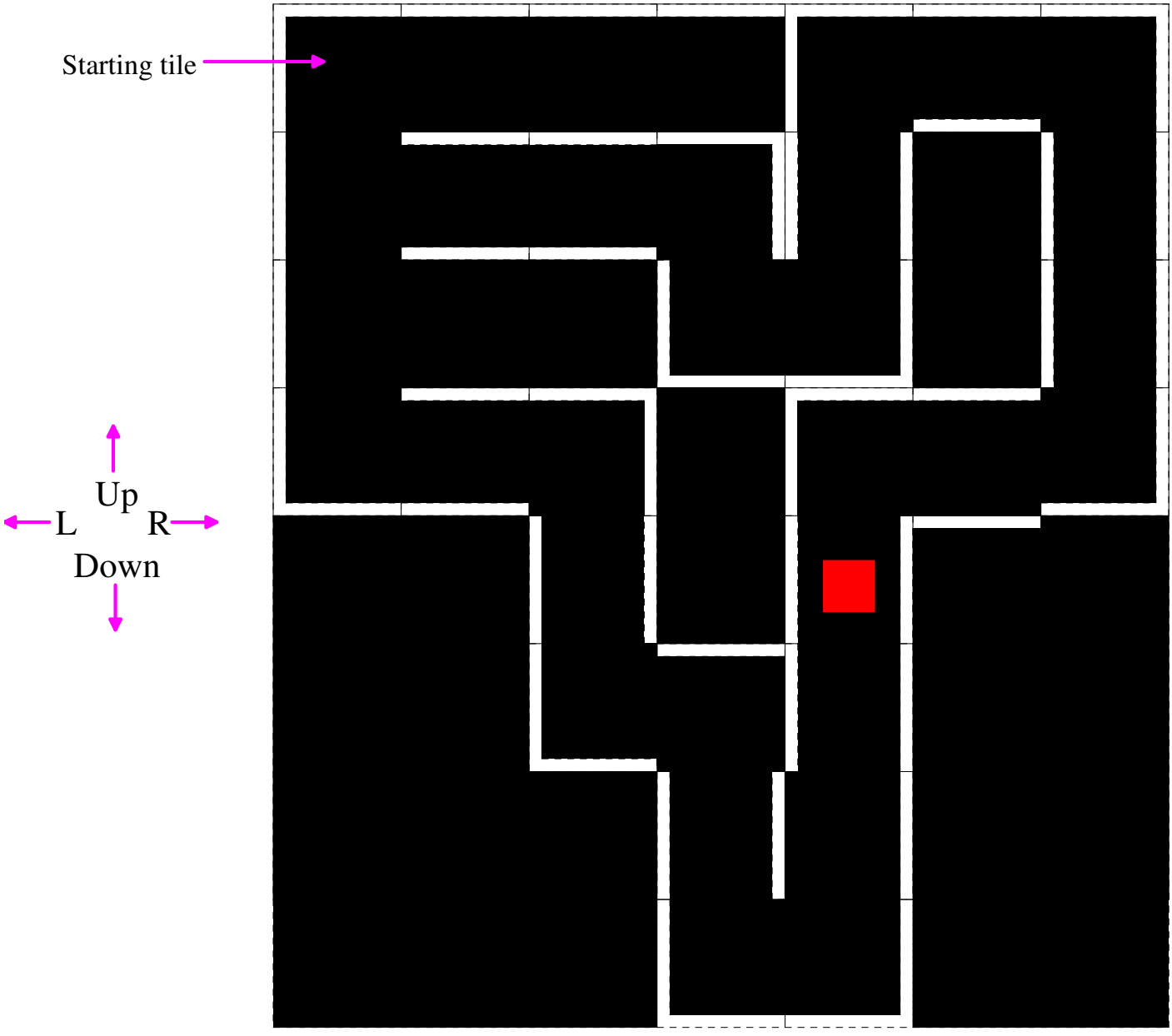
MICS 2011 Amazing Robot Race

The MICS 2011 robot contest will consist of your robot navigating an atypical maze -- an amaze. What makes the amaze atypical? Well, it has no real walls. The amaze will consist of 12”x 12”, black, vinyl floor tiles some of which will have 0.75” white strips (white vinyl electrical tape) along one or two sides. Your robot will treat these white strips as walls of the amaze. The four different types of tiles are:



All black | "L" strips | Parallel strips | One-side

The amaze will consist of up to 8 rows by 7 columns of tiles arranged in a rectangle to form an amaze. To successfully navigate the amaze, a robot must find a 5” x 5” red square in the middle of a tile and then return to its starting tile without completely crossing any white strips. A sample amaze might look like:



Each robot will attempt to navigate through two different amazes. On each attempt, a robot will be allowed a maximum of 7 minutes to navigate an amaze. Robots will always start in the middle of the upper-left-hand-corner

tile facing "down". If a robot completely crosses a white strip (i.e., all of its wheels cross the strip), it will be returned to the starting point by its builder **while the clock is still running**. The robot will be restarted facing "down" with the same program being run.

The Winner:

1. The robot successfully navigating both amazes in the shortest combined time is the winner.
2. If no robot successfully navigates both amazes, then the robot successfully navigating either amaze and finding the red square in the other amaze in the shortest combined time is the winner. The "combined time" is the time to successful navigate one amaze plus the time to find the red square in the other amaze.
3. If no robot successfully navigating either amaze and finds the red square in the other, then the robot successfully navigating either amaze in the shortest time is the winner.
4. If no robot successfully navigating either amaze, then the robot successfully finding the red square in both amazes in the shortest combined time is the winner.
5. If no robot successfully finds the red square in both amazes, then the robot finding a single red square in either amaze in the shortest time is the winner.

During an amaze run, a robot's first time to find the red square will be used, even if it is later restarted from the starting point.

Additional Rules:

1. Each robot must be fully autonomous, i.e., no communication to an external computer or human operator.
2. The maximum size of a robot at any point in the competition is 10" by 10" by 18" (vertical).
3. A robot which, as determined by the judges, intentionally damages the playing field in any fashion will be disqualified immediately. This includes leaving any "trail of bread crumbs, " or mark its path in any way. Once a robot is disqualified, the robot shall not be permitted to engage in any additional amaze runs.
4. Each robot will be allowed 7 minutes to find the red square and return to the starting tile on each of two different amazes. At any point during a robot's attempt on an amaze, the team can decide to restart their robot from the starting tile, but the clock will continue to run. The robot will be restarted as if it crossed a white strip (facing "down" with the same program).
5. Robots may NOT be reprogrammed or physically modified between amaze runs. The robot must run the same program when restarted on an amaze, but any knowledge about the amaze obtained before it was restarted **can** be retained. The robot must run the same program when running on the second amaze. The only allowed repair is changing batteries, and this must not result in a delay of the competition.
6. Upon reaching the 5" x 5" red square **and** upon returning to the starting tile after successfully navigating the amaze, a robot must indicate its happiness by beeping, playing music, doing a little dance, waving its arms, lighting a light, or displaying a message. Before starting an amaze attempt, inform the judge what robot behavior to look for upon reaching the red square and returning to the starting square.
7. Before the competition starts, all robots must be checked in **and be left with the judges**. Robots will be randomly numbered at check-in time. After check-in, two amazes will be constructed or revealed by the judges. Robots assigned odd numbers will run in ascending order (1, 3, 5, etc.) on one amaze, while even-numbered robots (2, 4, 6, etc.) run on the other amaze. Then, the odd and even robots will switch amazes and again run in ascending order.
8. Any robot that violates the spirit of the contest rules, in the judgment of the organizers, will be eliminated from competition. All decisions by the judges are final!
9. The tiles used in completion are Home Dynamix Flooring: Dynamix Vinyl Tile 1052 Black which can be ordered from: http://www.powersellerusa.com/dynamix-vinyl-tile-10521.html. A box of 20 is about $20, and a box of 30 is about $30.
10. The white strips will be 3/4 (0.75) inch wide, Duck brand 667 Pro Series, white, vinyl electrical tape.
11. The red square will be spray painted on the tile. The paint used will be Fire Red (20005) Walmart Brand, ColorPlace interior/exterior fast dry spray paint.