

SkillsUSA 2015 Contest Projects

Mobile Robotics Technology

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2015 SkillsUSA Mobile Robotics Competition

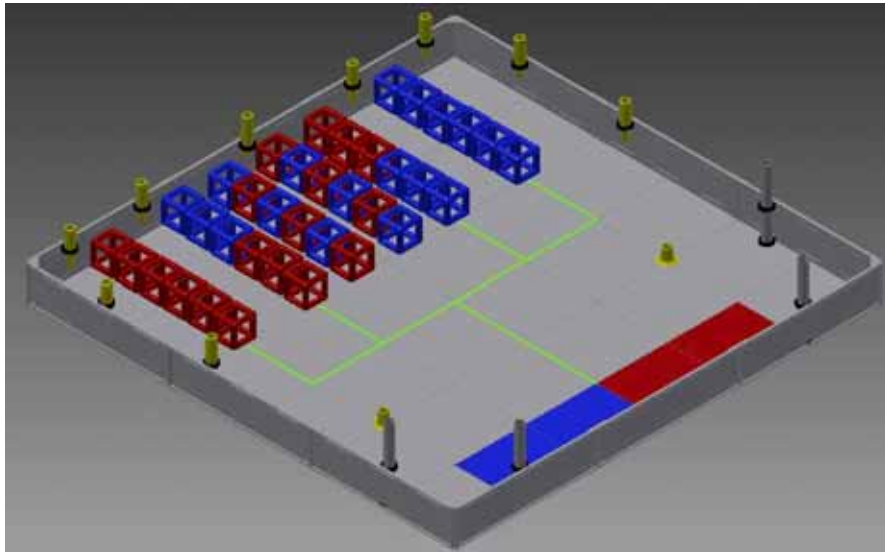


Figure 1: SKILLS 2015 playing field

The Game

In this year's challenge, teams are tasked with moving red and blue cubes into color-coded scoring zones during a two-minute autonomous and operator control round.

The Field

The 12' x 12' field contains 36 cubes; 18 are blue and 18 are red. The field contains a total of four posts that are approximately two feet tall. Two are in the blue scoring zone and two are in the red scoring zone. There are a total of nine yellow tower sections mounted to collars along the perimeter of the field. One tower base is placed in each scoring zone of the field. The field contains white tape lines that form a pattern on the inside of the field.

The Round

A team's robot is located completely inside the starting square at the beginning of the round. For the first 60 seconds of the round, the robot operates completely autonomously. Using sensors and pre-programmed instructions, the robot must attempt to strategically move the cubes across the playing field and into the scoring area. During the next 60 seconds of the round, drivers take control of the robot. Teams score points for each cube placed completely inside the corresponding color floor tiles or on a two foot post. Teams may also

build a "multiplying tower" by placing yellow tower sections into the yellow bases and then placing the appropriate colored cube onto the tower.

Scoring

Red Cube placed completely on a red tile: one point

Blue Cube placed completely on blue tile: one point

Red cube placed completely on blue tile: zero points

Any stacked cubes of the same color are awarded an additional point value based on the elevation. For example a red cube stacked on top of a red cube located inside the red scoring zone is worth two points.

Any matching color cubes placed on two foot posts will be considered a multiplier value and additional cubes placed will increase the value. For Example, one cube on the two foot post = 2x multiplier; two cubes = 3x, three cubes = 4x, four cubes = 5x

End of round bonus

Any yellow tower pieces assembled with a matching colored cube placed on the tower will multiply the "end-of-round" total score by the number of cubes that are placed on the tower.