

UNA Robotics Competition 2017

Happy Valentine's Day!

"...And wuv, tru wuv, will fowo you fowevea... So twarehouse your wuv."--The Princess Bride.

Valentine's Day is a day to follow your heart. Sometimes, though, there isn't enough time to get everything done that you want to do. So, your robot is going to have to help you out.

Competition Rules and Problems:

The following pages provide a description of each event and an overview of how points are scored. The overall ranking for the awards ceremony is determined by the total of all three events. A tie-breaker will occur at the end of the contest, if needed.

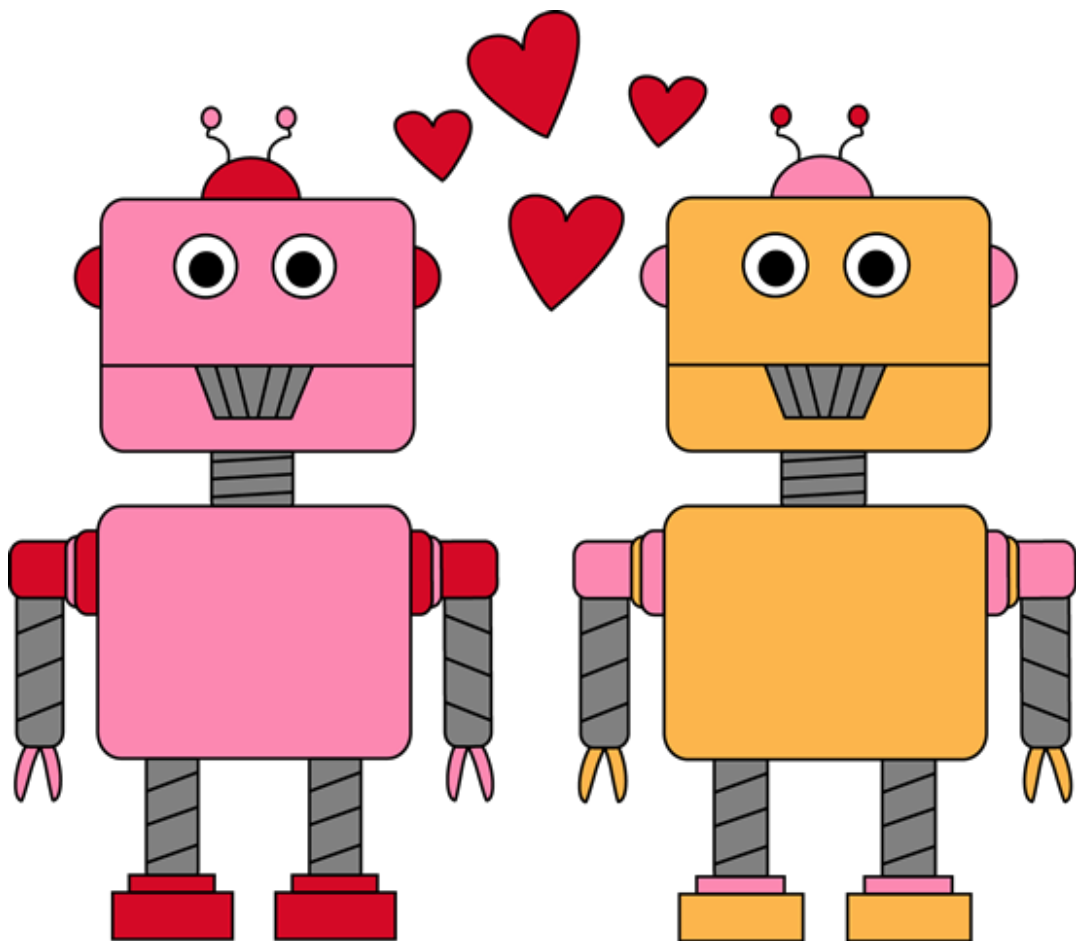
General Scorkeeping Rules:

1. The contest consists of 3 obstacle course problems that students can attempt over a 3-hour period.
2. The set of obstacles will span various levels of difficulty. Each challenge is worth a maximum of 100 points.
3. The overall team score is the sum of all three scores (for a total possible score of 300).
4. The obstacle courses and associated problems will not be revealed until the beginning of the contest.
5. Teams may work on any problem in any order.
6. Ranking will be based on the overall combined score from the individual challenges.
7. Some problems have disqualification measures (e.g., going off the playing field).
8. If a team has not completed the course after 90 seconds, they will receive points earned before the 90 second limit.
9. All courses will have a designated starting area. 1.The robot must start completely within the starting area. 2.The robot may face any direction when starting.
10. Students may not touch or remotely control the robot other than to initially place and start the robot.
11. A team may try each course multiple times.
 1. Teams must start at the back of the line for each new attempt.
 2. Each team may only be in line for one event at a time. It is not permissible to spread team members across multiple lines at any specific time.

3. When multiple attempts are made for a specific obstacle course, the best score of all attempts will be used in computing the overall score.

4. Teams may modify their programs and robot before making additional attempts to improve their score. Robots may not be altered such that there is a size violation (13in x 13in x 13in).

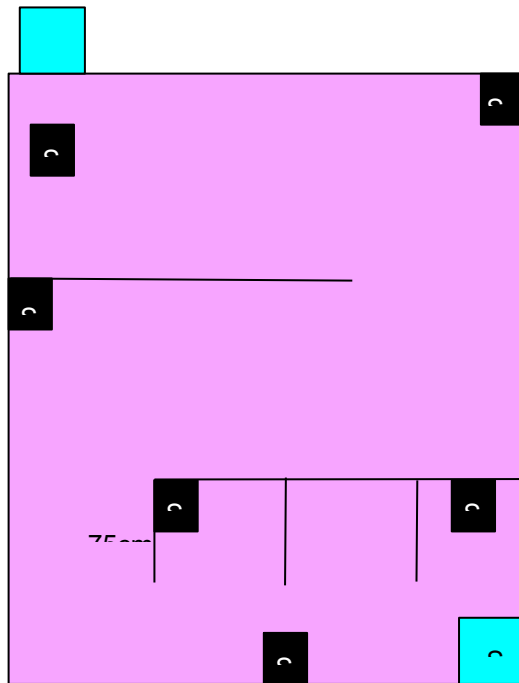
5. Only one team member may be in line with their robot at any one time. 12. There are clear boundary lines for the starting position. A robot may start with a portion of its body on the boundary of the starting area, but not extending beyond the boundary.



Puzzle One:

The Maze of Love

Maze 4.5m x 4.5m. The interior of the maze is made of $\frac{3}{4}$ " PVC pipe. The exterior is blue painter tape ($\frac{3}{4}$ "). There are 6 black squares in the maze. Your robot must move onto the black square in order to score. Each square is worth 15 points. If your robot crosses the exit line, you score a bonus 10 points. In order to score, your entire robot must cross over the line. If your robot crosses the blue painter tape, the round ends. You will score any points scored before the crossing. Crossing is defined as any portion of the robot crossing the blue tape and contacting the floor outside the perimeter. Sensors attached to the robot may cross over as long as they do not touch the floor outside. Robots may not fly in this event. Black squares are not necessarily square. They are made of $\frac{1}{2}$ sheet of black paper or construction paper. Teams may touch the PVC, but they may not cross the PVC. Crossing the PVC carries the same penalty of crossing the tape. A scale drawing of the field is provided.



UNA Robotics "Maze of Love"

ST=Start

Ex= Exit

S1-Centered. Touching PVC

S2- Centered on PVC. Touching tape. 2m from right corner

S3- In corner, touching PVC

S4-In corner, touching tape and PVC

S5- In corner, touching

Puzzle Two:

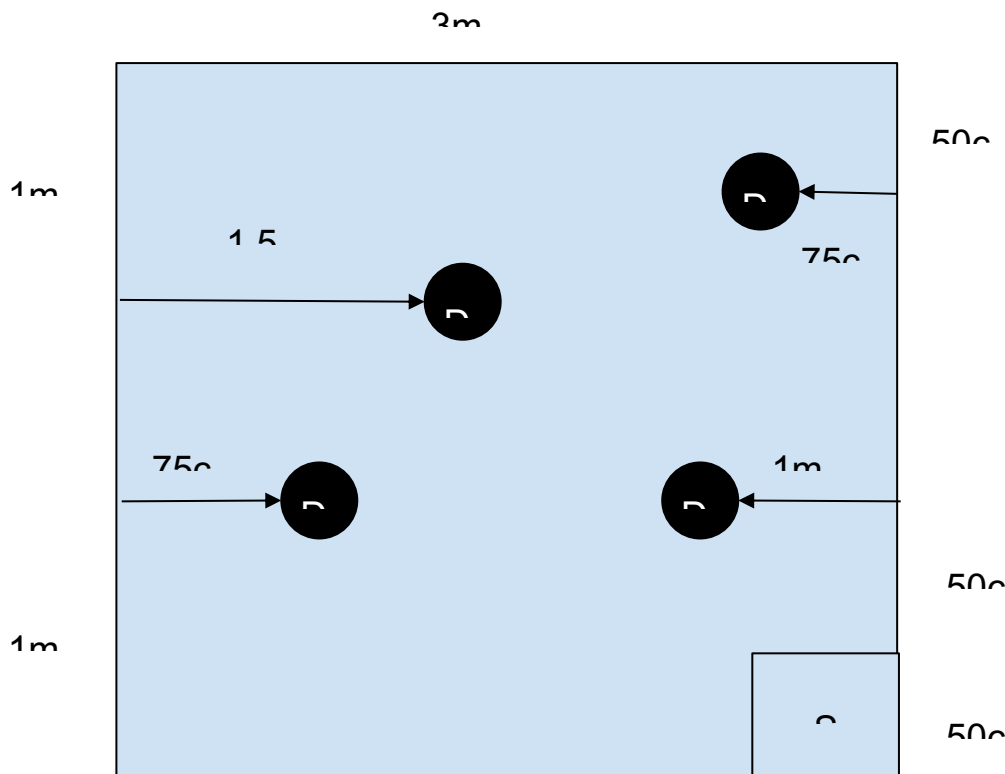
The Valentine's Day Dance

3m x 3m dance floor. 4 black spots on the floor “Dance Partners”. Each are numbered and must be done in order.

- A. Partner one likes to “Spin”. Your robot must touch the black dot, and then spin 360 degrees (a complete circle) in one direction, then 360 degrees in the opposite direction.
- B. Partner two likes to “Twist”. Your robot must touch the black dot, turn approximately 45 degrees one direction, then 45 degrees (from the original position) to the right. You must do this twice.
- C. Partner three likes to “Tango”. Your robot must touch the black dot, Move forward 30cm and back 30cm. It must do this routine twice.
- D. Partner four likes to “Line Dance”. Your robot must touch the black dot. Move forward 30cm, then back 30cm. Turn right. Move forward 30cm. Turn left. Move forward 30cm, then back 30 cm.

Each dance is worth 20 points. You only get credit for the dance if you finish it before time's up. If you finish all 4 dances in 90 seconds, you get a bonus 20 points.

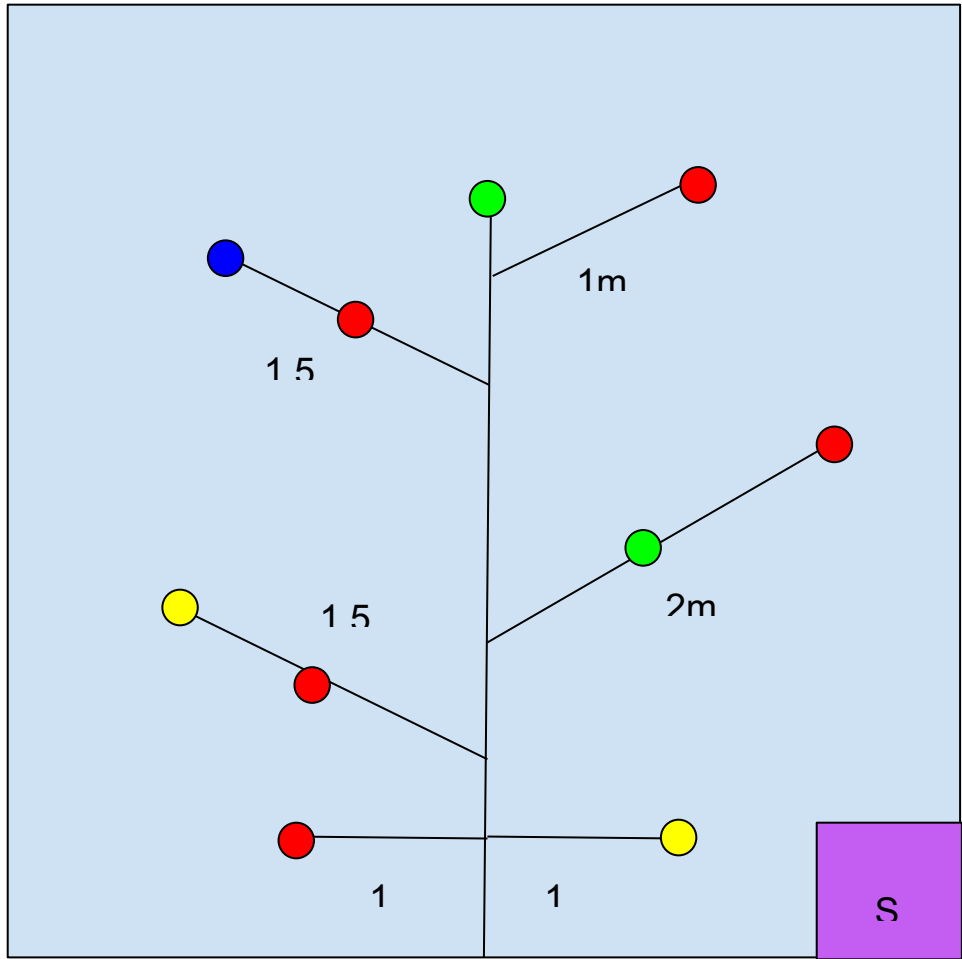
Musical notes of various colors decorate the dance floor.



Puzzle Three:

Time to get Flowers

4.5m x 4.5m flower garden. Your friend needs flowers. You need to pick some. However, they only like red flowers. On the field are 5 red flowers (Solo Cups). Your robot must move the cup completely off the starting circle. No portion of the cup can still touch the circle. Each red flower you pick is worth 15 points. Also on the field are 5 flowers of other colors. Do not pick these flowers, your friend will get mad. These flowers have a colored sticker in the middle of the circle they rest on. If any portion of this sticker is visible, you will receive -10 points. If you pick all 5 red flowers, in the 90 second time limit, you receive a 20 point bonus. Each flower is attached to a stem of the same color as the flower.



Tree: 3.75m

Angles: approx
60 deg

Flowers in the
center of the
branch will be
in the center

Drawing not to
scale

Colored flowers
may be
different colors.

Red flowers
always in these
positions.