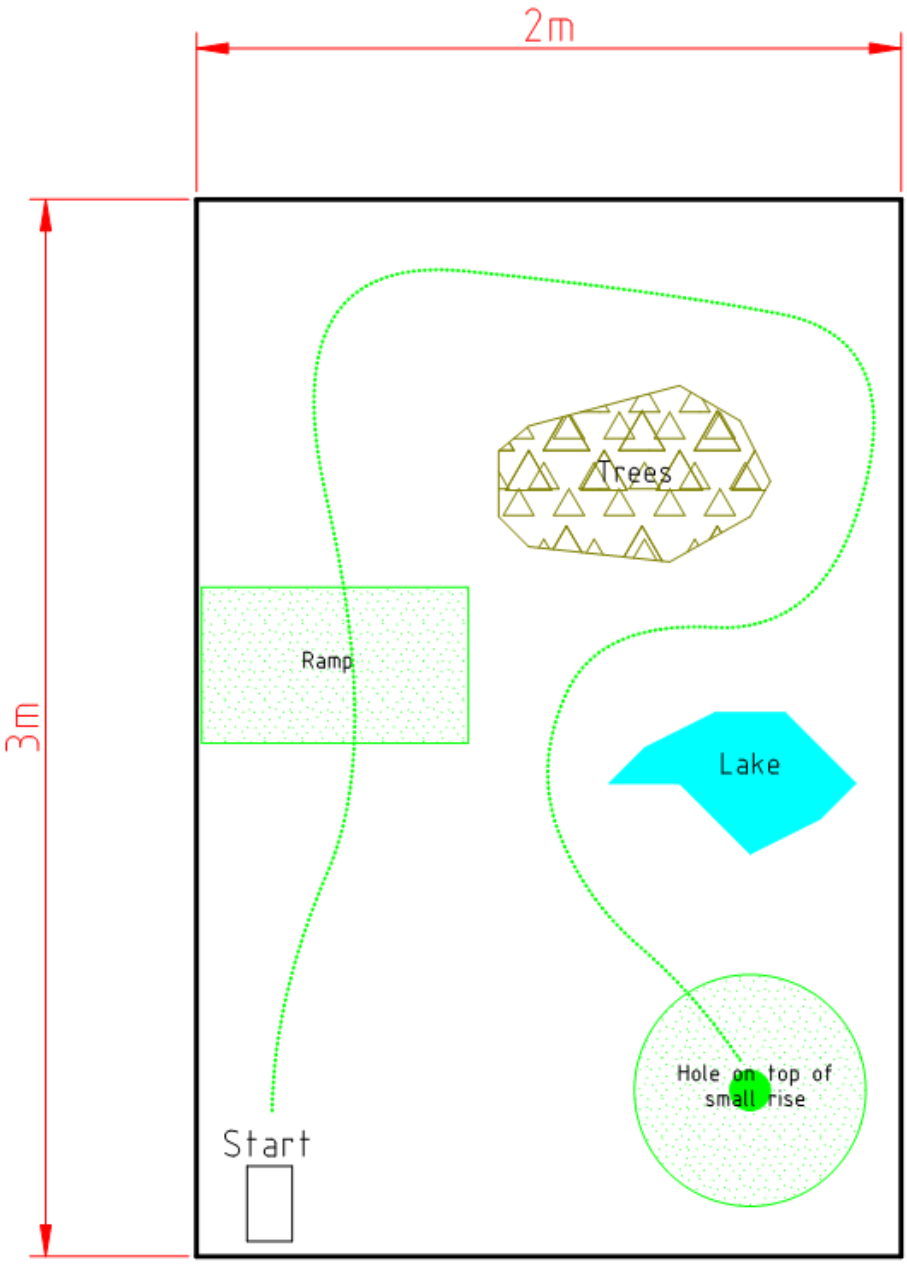
U3A Robot Challenges 2019 Details

Remote Controlled Challenges

U3A Crazy Golf Challenge

The Challenge:

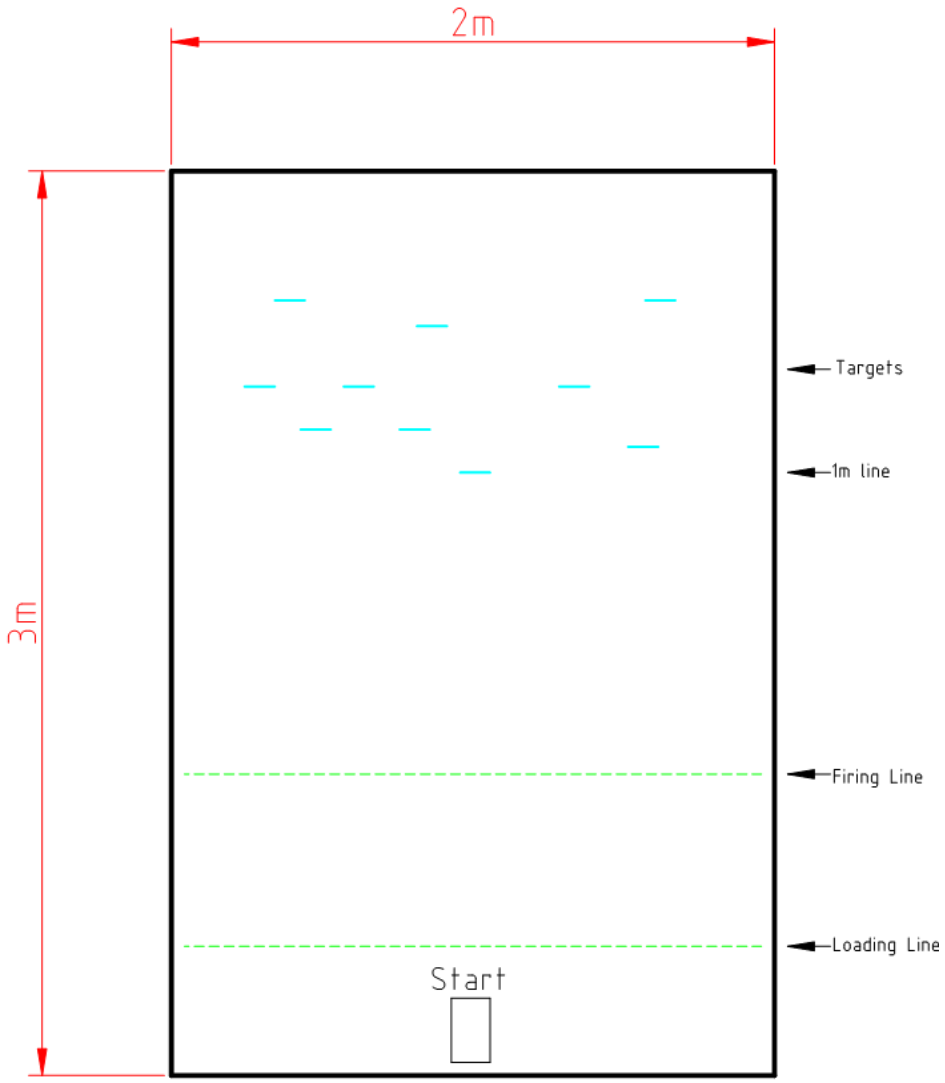
Navigate a real golf ball around an undulating course avoiding various obstacles, finishing by getting the ball into a hole that is on a raised mound (approximately 75mm high) using a remote controlled robot. The robot can push, capture, guide or knock the ball but cannot pick it up.



U3A Target Challenge (Hinged targets)

The Challenge:

To knock down hinged targets placed at various distances (1.5m to 2m) from a firing line, using an attachment able to fire soft projectiles. The firing mechanism can have a magazine holding a maximum of 5 projectiles. The robot can be reloaded by the robot returning to a starting point. A maximum of 2 reloads are allowed, a total of 15 projectiles. The robot cannot be driven beyond the firing line. A maximum time of **n** minutes will be allowed (to be decided) to complete the challenge. Points will be awarded in time order if all the targets are knocked down and then based on the number of targets knocked down if the maximum time is exceeded or all 15 projectiles are used. See proposed diagram attached.

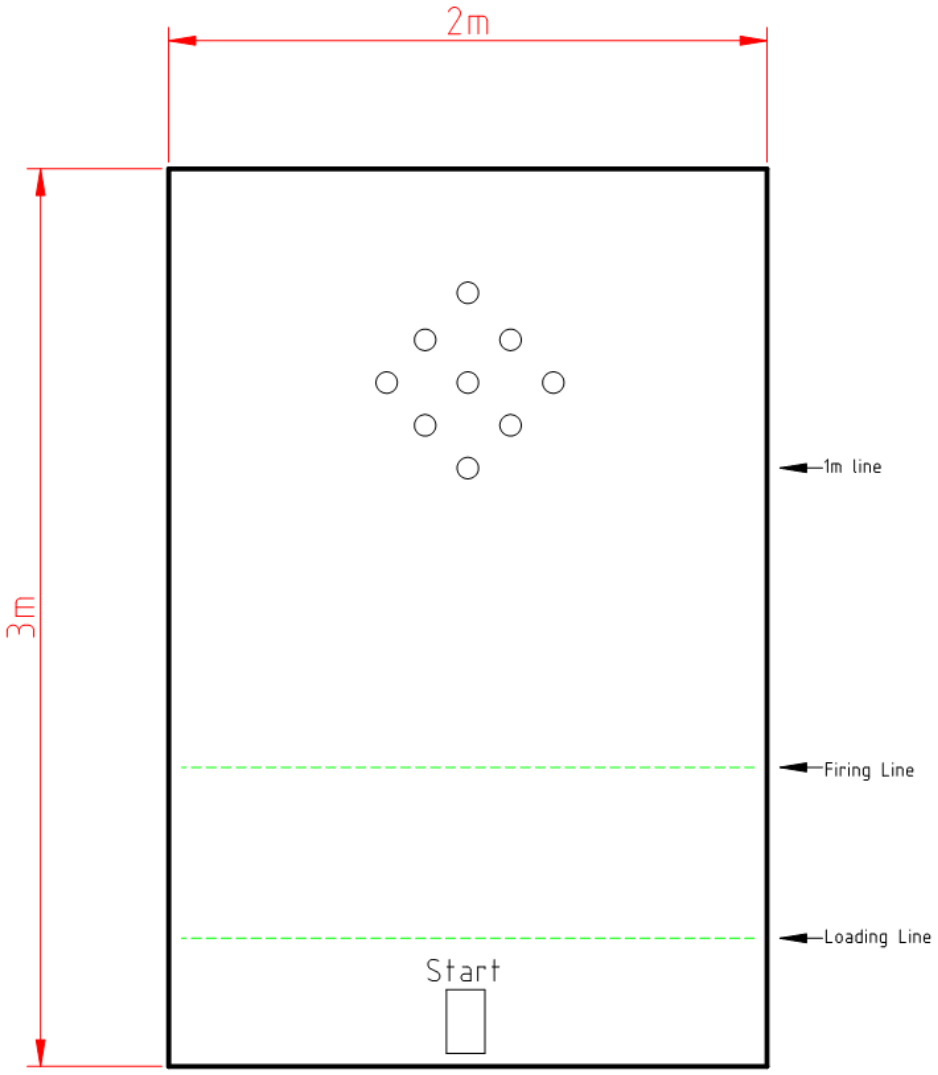


U3A Target Challenge (Skittles)

The Challenge:

To knock down a maximum of 9 wooden skittles placed in a diamond shape about 1.5m from a firing line, using a provided wooden ball (approx. 70 mm in diameter). A firing mechanism can be used to push the ball towards the skittles or you can simply use the momentum of the moving robot to push the ball. Please note the robot cannot be driven beyond the firing line. The robot will then return to the start position and the judge will retrieve the ball for the next go. A maximum of 3 attempts to knock down all the skittles can be made. A maximum time of **n** minutes will be allowed (to be decided) to complete the challenge. Points will be awarded in time order if all the skittles are knocked down and then based on the number of skittles knocked down if the maximum time is exceeded or all 3 attempts are used. See proposed diagram attached.

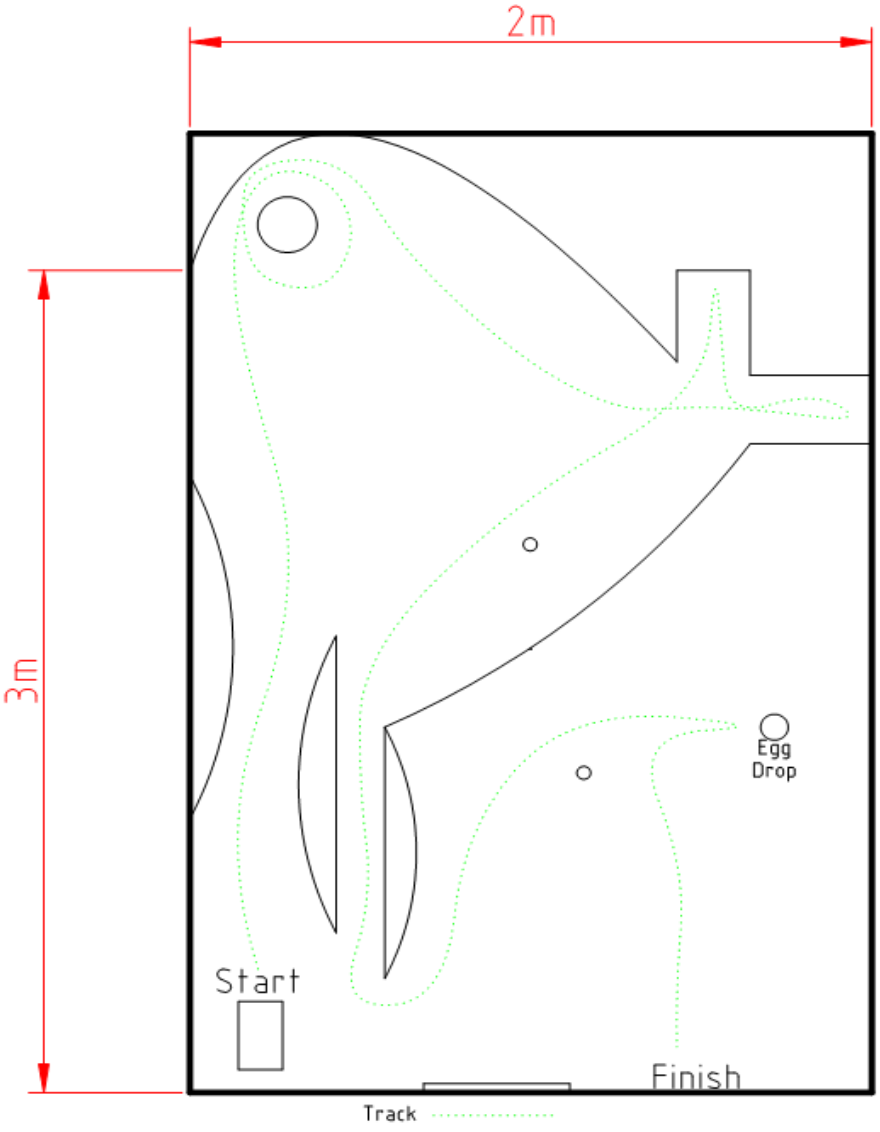
Note: only one of the 2 above target challenges will be used on the day depending on competitor's feedback beforehand. Please see Notes at the end.



U3A Egg and Spoon race Challenge

The Challenge:

To navigate the robot holding an egg (pseudo egg) in a spoon around a flat course in the shortest time. Extra points (time deduced) will be awarded for dropping the egg in a container at the end of the course before passing the finish line. Points will be deducted (time added) for each time the egg needs to be picked up and returned to the spoon. The course will contain various obstacles that will need to be negotiated. These will include chicanes, a roundabout which it is required to do a full 360° circuit before moving on to the parking area stopping and then reversing 90° into a second bay. Touching the walls of the bays will incur penalties. Several static obstacles will be placed around the course which if touched will also incur penalties. See attached proposed course layout.
Note: The egg & spoon will be provided, it will be necessary for the robot to have an attachment to hold a standard desert spoon.



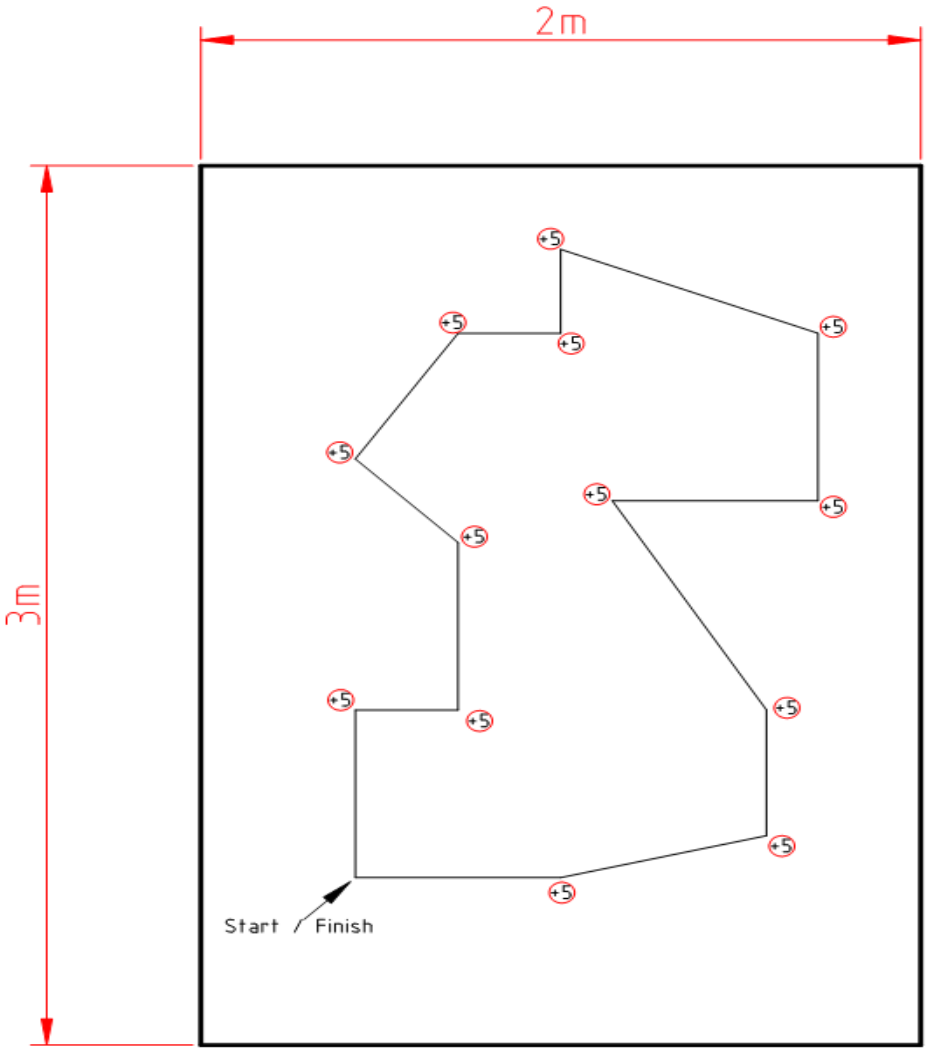
Autonomous Challenges

U3A Line following Challenge

The Challenge:

To navigate autonomously around a looped track. The track will be laid out on a contrasting flat surface either white on black or black on white (to be decided). The course area will be approximately 2m x 3m and the track will be approximately 20mm wide. The track will be made up of straight lines with corners angled between 45° to 135°. Points will be awarded for each corner successfully negotiated (indicated in a circle) and bonus points for each successful circuit of the track. A maximum time of **n** minutes will be allowed (to be decided) to complete the challenge. Points will be deducted if the robot leaves the perimeter of the course. The robot can be returned to the course at the same point it left the track.

See attached diagram of sample track, the final track design will be published in advance of the challenge day.



Line Following Challenge

In the diagram above, the numbers in circles represent the points that can be accumulated by completing the prior section of line correctly.

Notes:

1. Please note that the arena dimensions are approximate and will depend on standard material sizes, so possibly making them very slightly larger.
2. Please would you contact the organising team with your preference for the ”Target” or “Skittles” version. The Target version will require an attachment for firing projectiles or rubber balls, whereas the Skittles version will only require pushing a wooden ball, possibly from an attached scoop at the front. Please contact us by email on cannockchaseu3a@gmail.com with your preference. We only intend building one of the arenas for this challenge, depending on feedback. Thank you.

Contacts:

Barry James at Cannock Chase U3A, cannockchaseu3a@gmail.com

Ernie Prevost at Cannock Chase U3A, ernie@prevost.me.uk

Michaela Moody at The Science Network, michaelamoody2015@gmail.com