Spirit of Curiosity
(Fetch & Carry)

Marian's conclusions 5.9.18:

- Purpose of the challenge is to test the basic robot for speed (when empty) and smooth driving (when full) over varied terrain.
- **Elliot**: Note how the bowl attachment has to be fixed. This is very specific. It may impact the basic robot design and how other attachments are fixed. (The diagram below miraculously appeared when I cut and pasted the info from the balloon piercing challenge)
- **Elliot/DJ**: Fine driving skills from the roboteer, robot and remote control required.
- **All**: If your reading of the challenge is different from mine, please say so earlier rather than later!

Aim of the Challenge

- To collect rock samples from the lunar landscape.
- A remote-controlled, Fetch-and-Carry challenge.

Control Method

- Remote-controlled

Time Limit

- 5 minutes

Rules

- Robots will be placed at one corner of an arena with sections of uneven terrain.
- At the opposite corner of the arena, a collection of samples will be gathered; this is known as the 'sample site'.
- There will be multiple routes to the sample site. It is up to the roboteer which route they take to and from the site.
- The robot will be outfitted with a small 'bowl' attachment, fixed to the robot using similar techniques to the Pi Noon pin/balloon attachment*. The fixing pole for the bowl is approximately 3mm wide, but you should ensure it can handle slightly wider to cope with any small differences in widths.
- Roboteers should guide their robot, using remote controls, to the sample site. A member of the team (or volunteer) will then manually (by hand) place a single sample from the pile into the bowl attachment. They must then pilot the robot back to the start corner and manually (by hand) 'unload' the sample into a collection basket.
- Both loading and unloading of the sample is expected to be a manual pick-up-and-place by member(s) of the roboteers' team or a volunteer.
- A single attempt of the challenge is permitted within the 5 minute limit. This will involve multiple trips from the start corner to the sample site.
- Ranking and Points
- To follow but expect a certain number of points per sample collected.

Hints

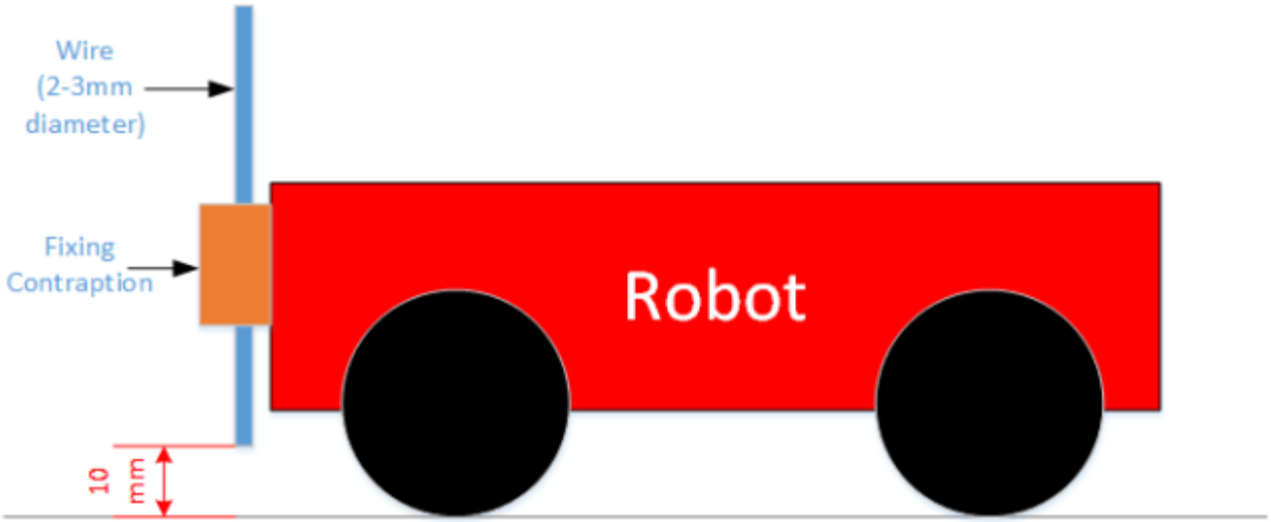
- Some routes from the start corner to the sample site, and back again (obviously) will be less bumpy than others. These 'less bumpy' routes will take longer to navigate than the more tricky terrain routes.
- Samples will vary in size and weight. The maximum sample weight will be typically 20-40 grammes. Sizes will range from between 2cm and 4cm diameter.
- Sample holder is yet to be designed, but is expected to remain below 100 grammes.
- Other hints to follow

Ask Questions and Discuss

You can discuss this challenge and ask questions on the discussion forum or via Discord chat.

***The 'Attachment' (https://piwars.org/2019-competition/challenges/pi-noon/)**

- Your robot must be able to hold a wire approx **3mm** (measured to be 2.95mm, but you should allow at least 3.1mm) in diameter, 1cm off the ground.
- We will provide a 1cm plastic cube for the judges to use to ensure the distance from the ground is consistent.
- We recommend (but do not mandate) using an electrical connector block for the 'fixing contraption'. We can provide one free-of-charge for you to use.



- The wire must be attached to the front of your robot, in the centre without anything further forward than it.
- The wire will be about the weight of a quarter coat hanger.
- *The wire will be shorter than previous years in an attempt to avoid over-balancing smaller robots.*
- The wire must be fixed so that it is not angled in relation to the floor. i.e. the wire must be 90 degrees perpendicular to the floor. This is to ensure that the height of the two sets of balloons are approximately the same.
- The wire will be fixed onto your robot, by the judges, before each duel.
- The wire will only be on the robot during the duels in which you take part.
- If the wire falls off the robot then you will be allowed to re-attach it up to a maximum of 2 times.
- If the wire falls off a 3rd time, you will be judged to have lost the round.
- **Only the competition judge may enter the arena to retrieve the robot and attachment.**

Hints

- The 'attachment' may cause robot instability by shifting the centre of gravity upwards. Be aware of this when designing your robot. You might think about adding optional weight to the rear of your robot to balance it, for example.
- It is essential to ensure that the attachment holder (e.g. an electrical terminal block) is held securely onto your robot. Tape is not recommended as the wire tends to swivel in place.
- You do not have to use the attachment holder supplied by PiWars, however we strongly recommend ensuring that the attachment doesn't allow the wire to 'spin' as it makes the centre of gravity shift and makes aiming very difficult.
- There may be spiked obstacles in the arena, although the central pyramid from 2018 will not be used.
- Here is a video of the 2018 final: https://piwars.org/2019-competition/challenges/pi-noon/