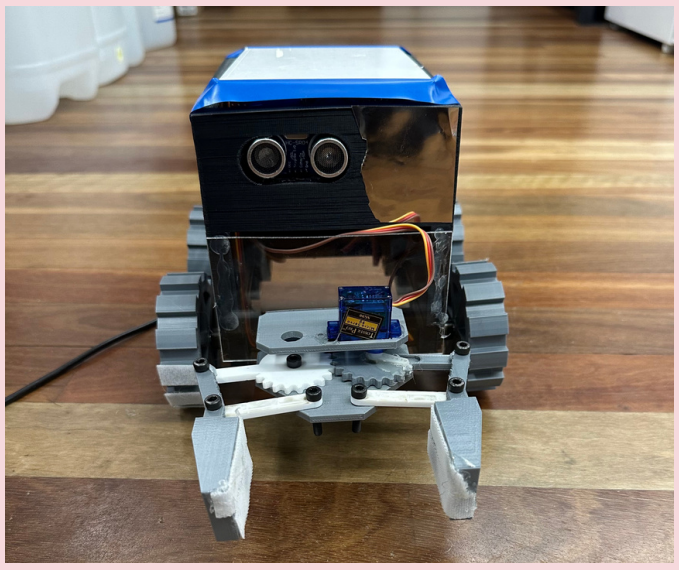
# R2R TEAM #14

## Robust Design



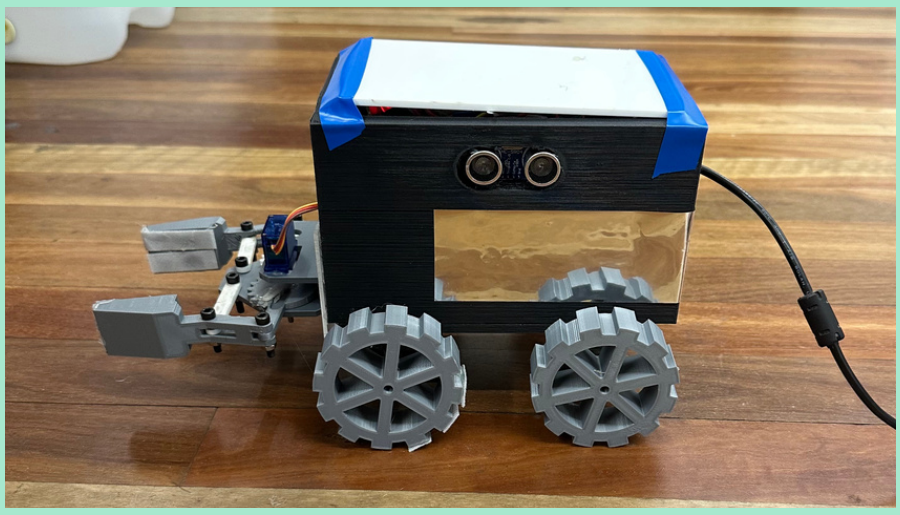
As well, the compact design of the robot ensures that no wires or other components are out of bounds, potentially disrupting the robot's path which would be hazardous in a rescue situation.

The plastic used in 3D printing is generic polyactic acid (PLA). One of the measures for the robustness of materials is through tensile strength, which is a numerical measurement on the ability of materials to withstand a maximum amount of stress without failure. The tensile strength of 3D printed plastics is 50Mpa thus proving its strength.

## Aesthetic Appeal

The robot has a mechanical robot-like look, as opposed to having a human-like look. This is done in order to have it stand out in a high pressure rescue situation. It also enables rescue victims to easily recognise the robot and that it may be there to assist them.

The robot has a dark black body as it was most feasible to do so with the given resources, however a rescue situation may have low visibility or poor lightning and thus the robot is covered in reflective material that allows for it to be easily recognisable in a rescue situation.



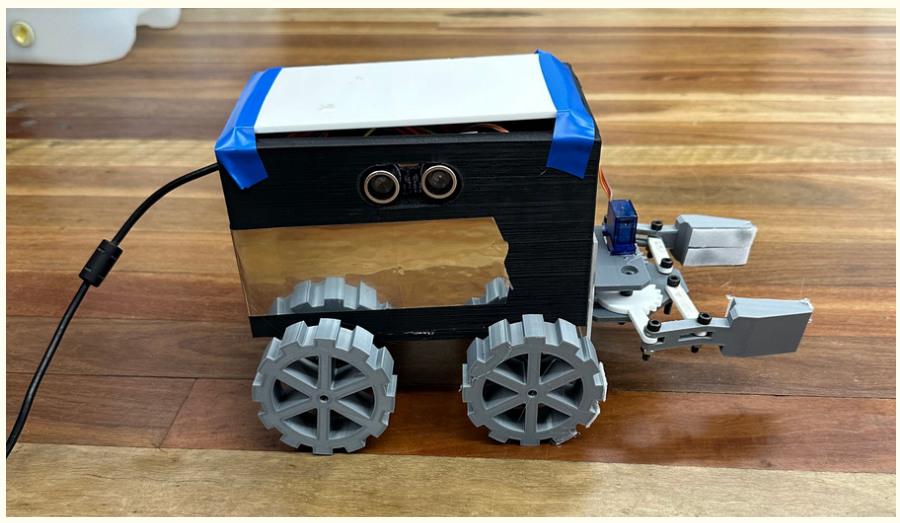
## Engineering Quality

The main body of the robot is 3D printed using PLA filament with an infill of 40% providing a strong and stable outer body for rescue scenarios.

3D printing the main components of the robot including the chassis, gripper and wheels allows for customisation in which the movement, durability and functionality of the robot is optimised.

The main body consists of two segments: the ‘chassis’ and the ‘lid’ which are joined together after printing to separate the moving mechanism of the robot and the inner circuit boards.

The placement of the arduino board is on a level above the servo motors and the circuit boards while still allowing the electrical components access to each other through cut outs inside the main body.



## Innovation

In our robot design, we have implemented the innovation of integrating a velcro lining on the gripper mechanism. Unlike conventional robots which would only have the gripper, the added velcro lining ensures that the grippers can grasp onto the tennis ball without failure. Through the adhesive properties of velcro, a tighter hold between gripper and ball is maintained, thus allowing for easier movement and precise handling. Hence, the innovation enhances the robots ability on holding the ball whilst also minimising the error of dropping the ball.