R2R : TEAM 18

FLOPSTARS!

Fig 1. Front view of the robot

Robust Design

The frame of the robot is constructed using sturdy, 3mm thick acrylic. The spherical scoop allows the tennis ball to sit securely during travel. The bevelled, bottom edges further eases the ball's lift. The ultrasonic sensor measures the distance from obstacles, communicating so to the operator. The responsive UI enables the operator to promptly respond to these obstacles and change the robots trajectory. Though unlikely, if a collision were to occur, the robot will remain in tact, due to the use of powerful, hot glue bonding the walls.

Engineering Quality

The robot demonstrates high engineering quality. It is durable; enduring uneven surfaces and external forces. Furthermore, the robot's abilities were prioritised so they work optimally. With such, it meets the objectives and constraints of the challenge. Via an ultrasonic sensor, the robot can detect obstacles and manoeuvre through the maze. The scoop, powered by a pinion and racks, easily collects a tennis ball. The robot is 20cm x 10 cm x 25 cm in size and weighs 950g, therefore meeting the physical constraints.

Fig 2. Side view of the robot

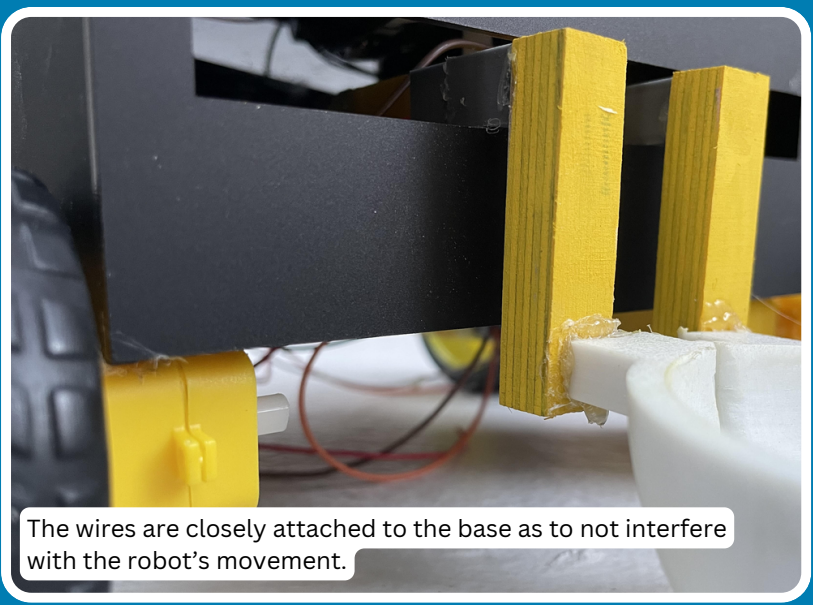

Fig 3. Concealed wires beneath the robot

Aesthetic Appeal

The rescue robot has a minimalistic design, featuring an acrylic box with four wheels. This simplicity aimed to have the robot, in a rescue context, appear non-threatening.The wiring of the robot is also neat and concealed, as an exposed complex display may adversely confuse the victim. The use of vibrant yellow paint creates a cohesive, visually pleasing design, but also improves the victim's detection of the robot. Lastly, the LCD screen aesthetically communicates the robot's purpose to the victim

Innovation

The design was further extended by incorporating unique innovations. Though the use of a scoop is common, our variation required an innovative mechanical solution; using a pinion and two parallel racks to create a linearly sliding scoop. The LCD screen is an innovative element, which can display a message to the victim, thus effectively communicating it's purpose. These messages reassure the victim and reduce panic.

Fig 4 (above). LCD screen

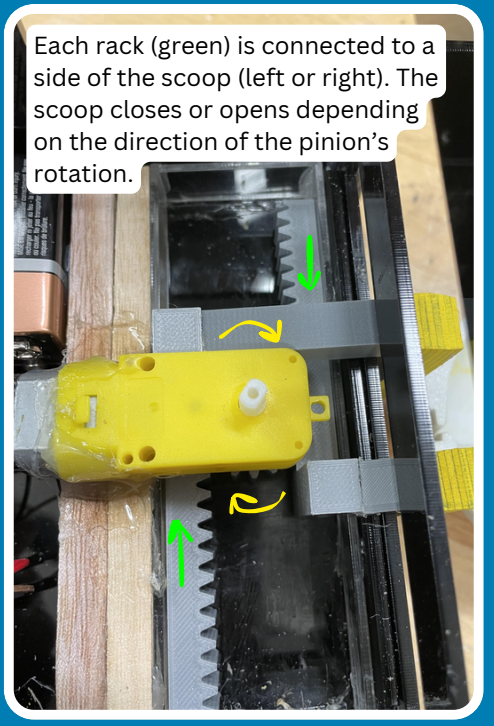

Fig 5 (right). Pinion inion and rack system