

#### Question 4

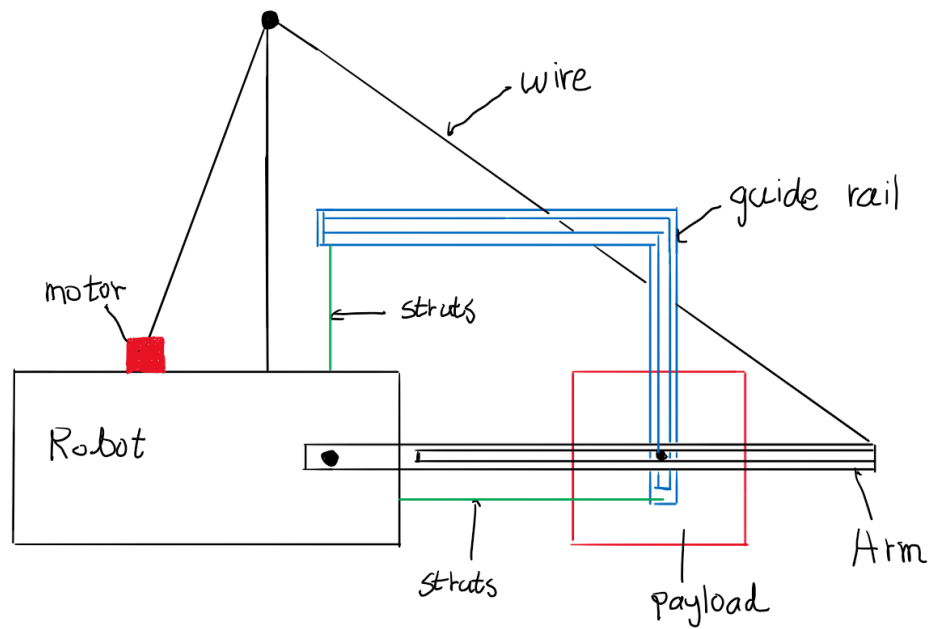


Figure 1 Side View

The attachment mechanism that I developed employs a guide rail that helps to keep the module to move in one direction at a time. As the arm rotates, the empty slot within the robotic arm allows the payload to slide and move in the direction of the guide rail. From a global perspective, the payload would first move up then move left towards its designated retracted position.

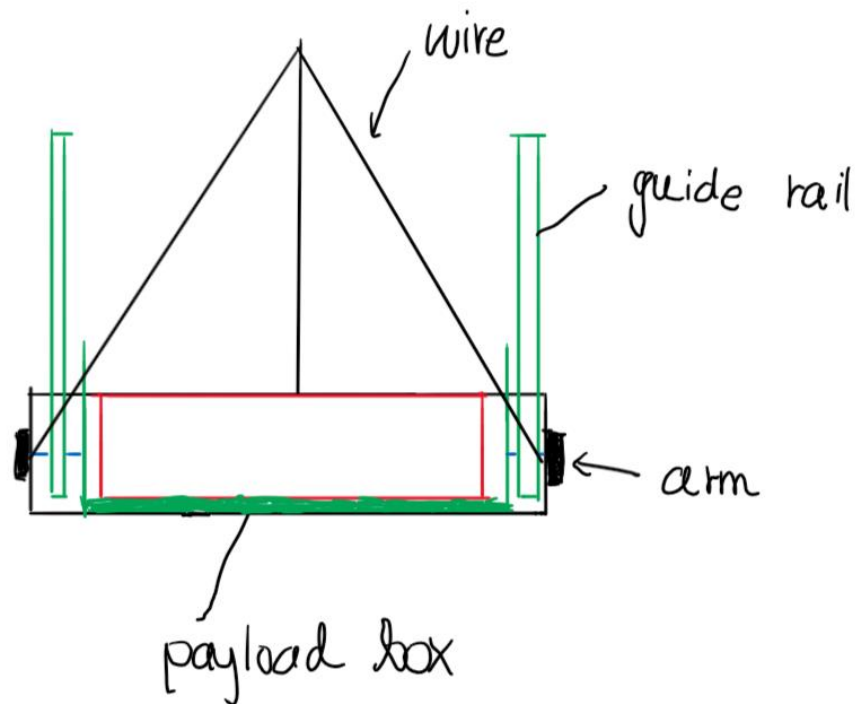


Figure 2 Front View

One component that I did not employ in the side view of the mechanism (to avoid confusion) is the payload box. The box carries the module and allows it to sit firmly as the arm rotates up and down. Once the arm reaches the bottommost deployment position, the robot could drive away, allowing the module to be fully deployed. To retrieve the module, one simply has to slide the bottom surface of the box under the module and activate the robot arm.

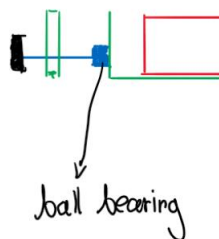
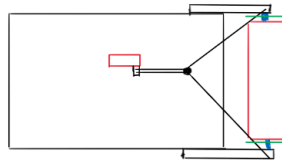


Figure 3 Connection Mechanism

The blue line depicted in Figure 2 symbolizes the connection mechanism that connects the robot arm to the payload deployment box. In Figure 3, the mechanism is magnified. The ball bearing is a critical component of the system as it allows the payload box to stay upright as the arm rotates.



*Figure 4 Top View*

Figure 4 demonstrates the top view of the attachment mechanism. The robotic arm is actuated by a motor (drawn in red on the robot itself) that is placed sideways, and the two strings tied to the motor could lift and lower the robotic arm as controlled by the operator.