

Kwadropus Duster Arm

The Kwadropus is a robotic duster for a space station--clean dust from the surfaces inside a microgravity environment. The idea is to operate similar to how an octopus would move around the ocean floor without damaging the space station or the people--soft robotics. The initial robot may be as large as 2ft in diameter and 10 kg--eventually it will be made smaller to dust in confined areas. ***This team is building the Duster Arm that will make contact with the surface that needs to be cleaned. The majority of the dust comes from the dead skin cells and hair liberated from the astronauts with some lint from cloth and maybe materials from the experimental mice. The dust is held to the painted and metallic surfaces by static electricity, mechanical adhesion and perhaps some chemical adhesion. The Duster Arm needs to collect the dust without liberating it into the air and without pushing the robot off the rack face. The Duster Arm needs to retain a significant amount dust so that the majority of a module can be cleaned without having to stop and remove the dust from the Duster Arm.***

1. Does the team have a good Presentation Board (edited for spelling and grammar) with drawings, descriptions, early prototypes and any research to help them present their ideas?

Mark only one oval.

1 2 3 4

Insu Excellent

2. 2. Does the team have a good Brochure that has pictures of their team and current prototype along with a QR code for more information about their prototype and ideas?

Mark only one oval.

1 2 3 4

Insu Excellent

3. 3. Prototype is made of a soft material without sharp or hard edges that will damage the painted surface

Mark only one oval.

1 2 3 4

Insu Excellent

4. 4. Moves in a slow steady motion that is unlikely to liberate dust into the air.

Mark only one oval.

1 2 3 4

Insu Excellent

5. 5. Has lots of small fibers, hair like structures, nooks and crannies, or empty spaces that will capture the dust until the robot can be vacuumed clean.

Mark only one oval.

1 2 3 4

Insu Excellent

6. 6. Easy to clean with a vacuum cleaner

Mark only one oval.

1 2 3 4

Insu Excellent

7. 7. Duster Arm material could be used multiple times before being replaced due to being too dusty or uncleanable.

Mark only one oval.

1 2 3 4

Insu Excellent

8. 8. Initially this can be controlled by hand but eventually it will need to be electromechanical or pneumatic. Did the team explain or demonstrate how the motion for the Duster Arm could be automated for the robot?

Mark only one oval.

1 2 3 4

Insu Excellent

9. 8. Did everyone on the team share in the discussion?

Mark only one oval.

1 2 3 4

Insu Excellent

10. 12. Comments--Constructive criticism or Compliments
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