Kwadropus Controls

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 Controls for the robot with decentralized computing where each Mobility Arm can run independent of the others and the central brain controls the Duster Arm and the Propulsion System with room left for determining the path the robot will take to clean the module(not needed yet). The team only needs to demonstrate the functionality of one arm and the central brain running the dusting arm, responding to attachment sensors for the arm/suction cups and the proximity sensors for the propulsion. Although Arduino (arm brain) and Raspberry Pi (central brain) were used as examples, the teams can use any processors the find appropriate.***

1.   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.

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Insu	○	○	○	○	Excellent

3.   3.   Does the team have a Design Flo chart to describe their programming code logic?

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4.   4.   Can the arm brain control at least 3 servo motors--2 for the mobility arm and one for the suction cups?

Mark only one oval.

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Insu	○	○	○	○	Excellent

5.   5. Does the arm brain and servos respond to positioning of at least 2 sensors--one for the mobility arm grabbing a handrail and one for the suction cups attaching to a surface?

Mark only one oval.

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Insu	○	○	○	○	Excellent

6.   6. Sensor on arm brain pauses servos for 10 sec. to hold handrail then servos start again to release from handrail.

Mark only one oval.

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Insu	○	○	○	○	Excellent

7.   7. Does the central brain run 2 servos for the Duster Arm (one slow and steady rotation, one oscillating forward and backward every 3 sec)

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Insu	○	○	○	○	Excellent

8.   8. Does the central brain run a third servo for the propulsion that is activated only when a sensor shows the Kwadropus is not in contact with the wall.

Mark only one oval.

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Insu	◯	◯	◯	◯	Excellent

9.   9. Is the display of the central brain, arm brain and servos laid out in an easy to understand format

Mark only one oval.

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Insu	◯	◯	◯	◯	Excellent

10.   10.   Did everyone on the team share in the discussion?

Mark only one oval.

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Insu	◯	◯	◯	◯	Excellent

11.   11. Comments--Constructive criticism or Compliments

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