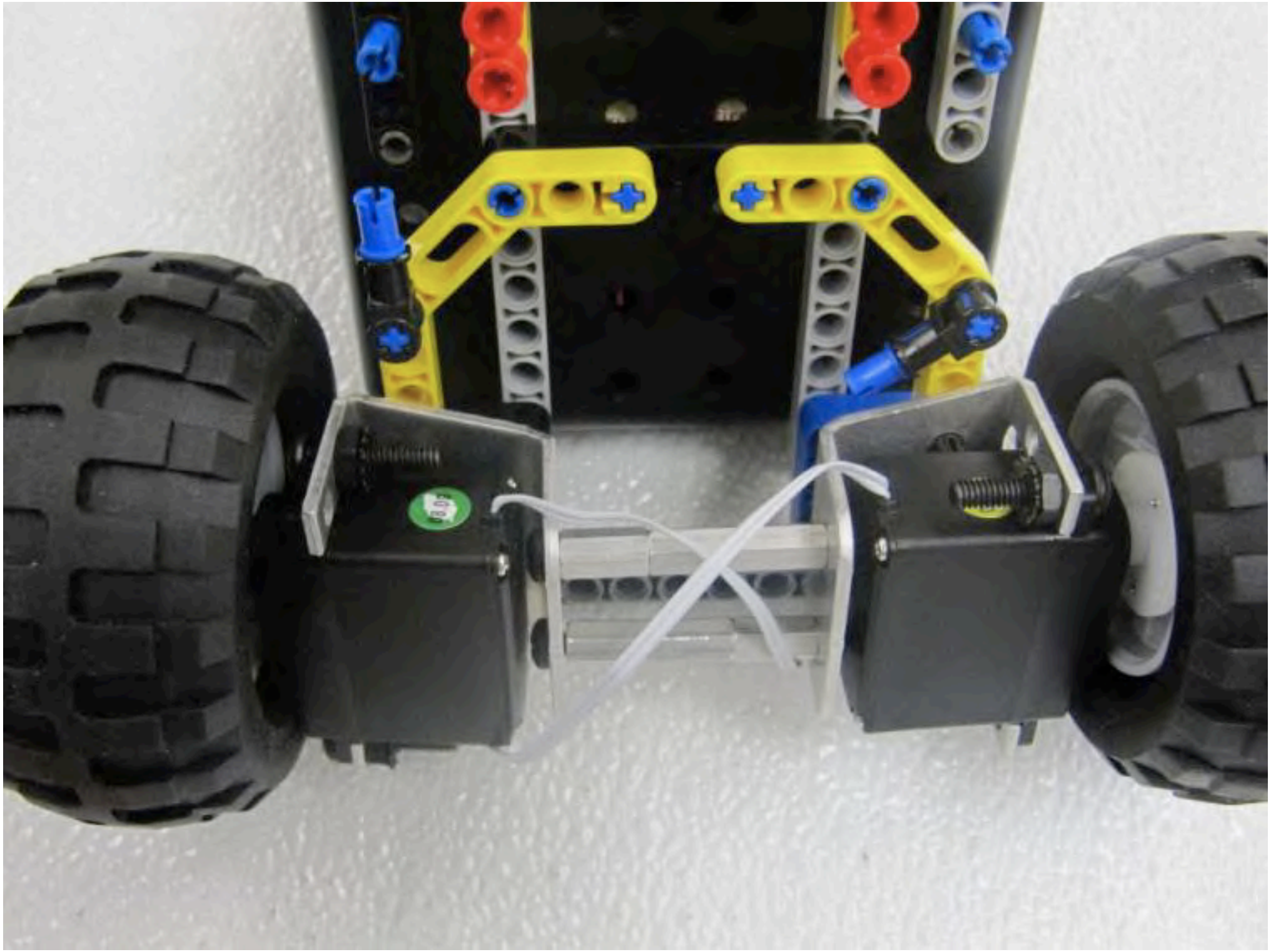
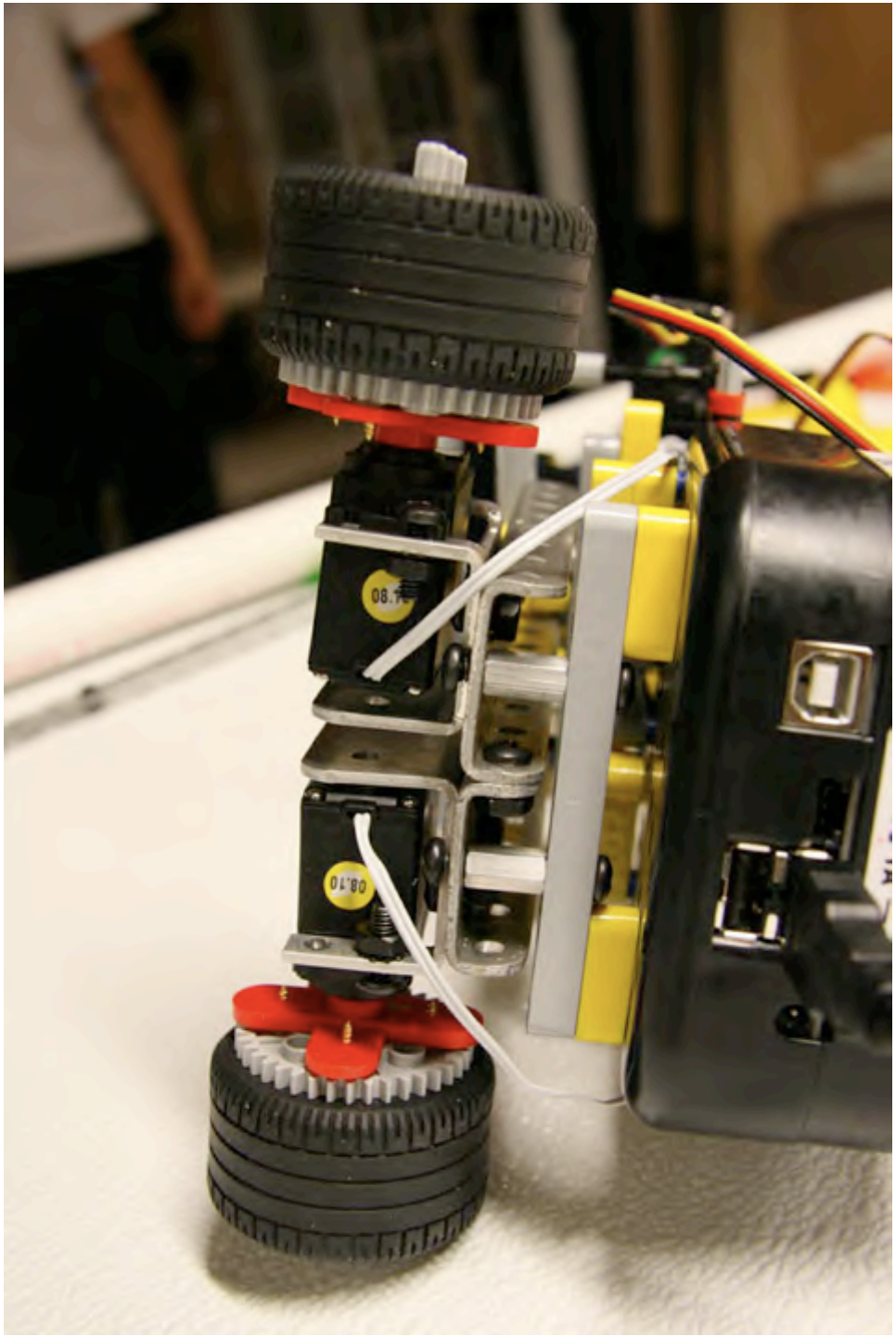
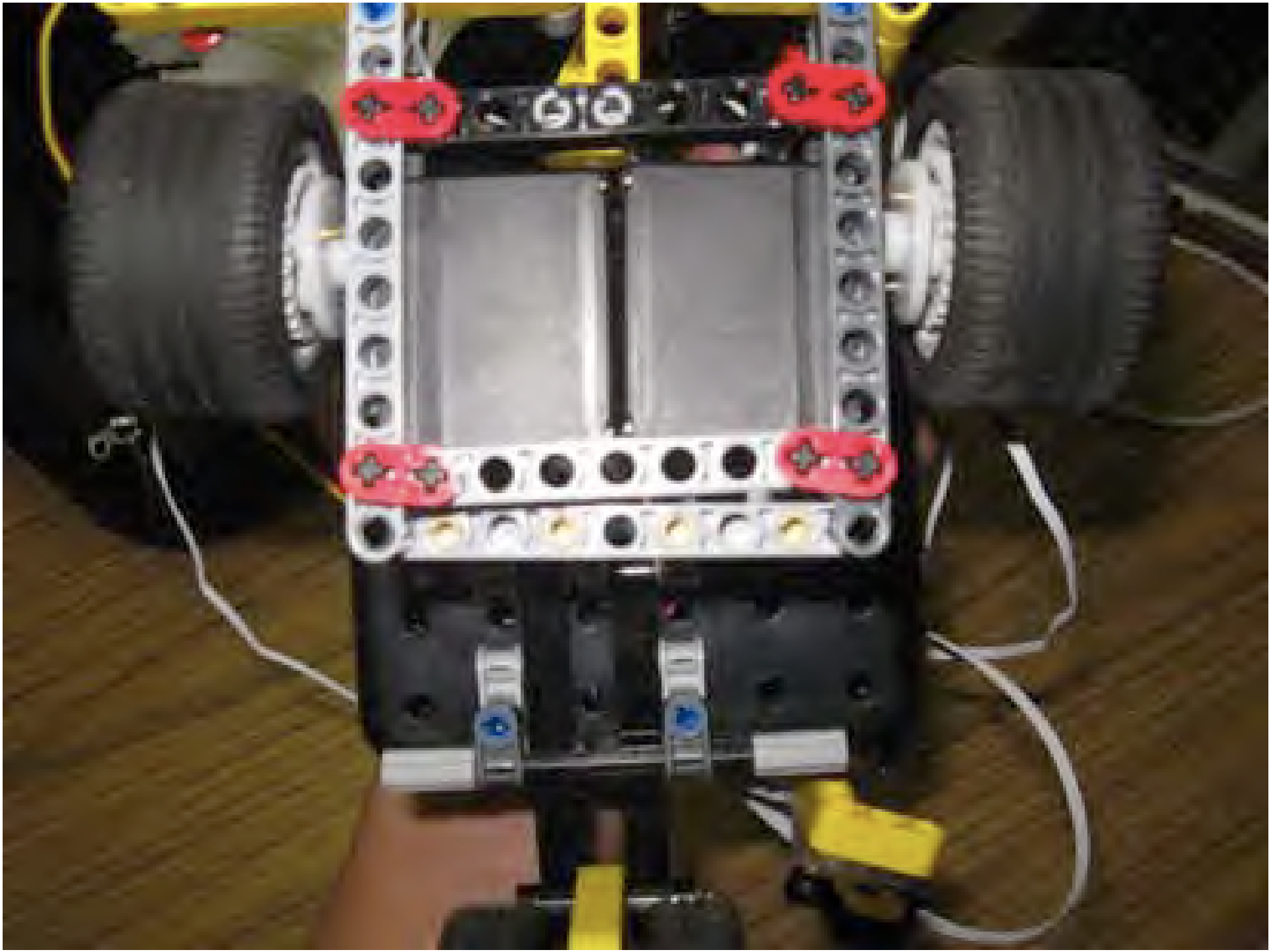
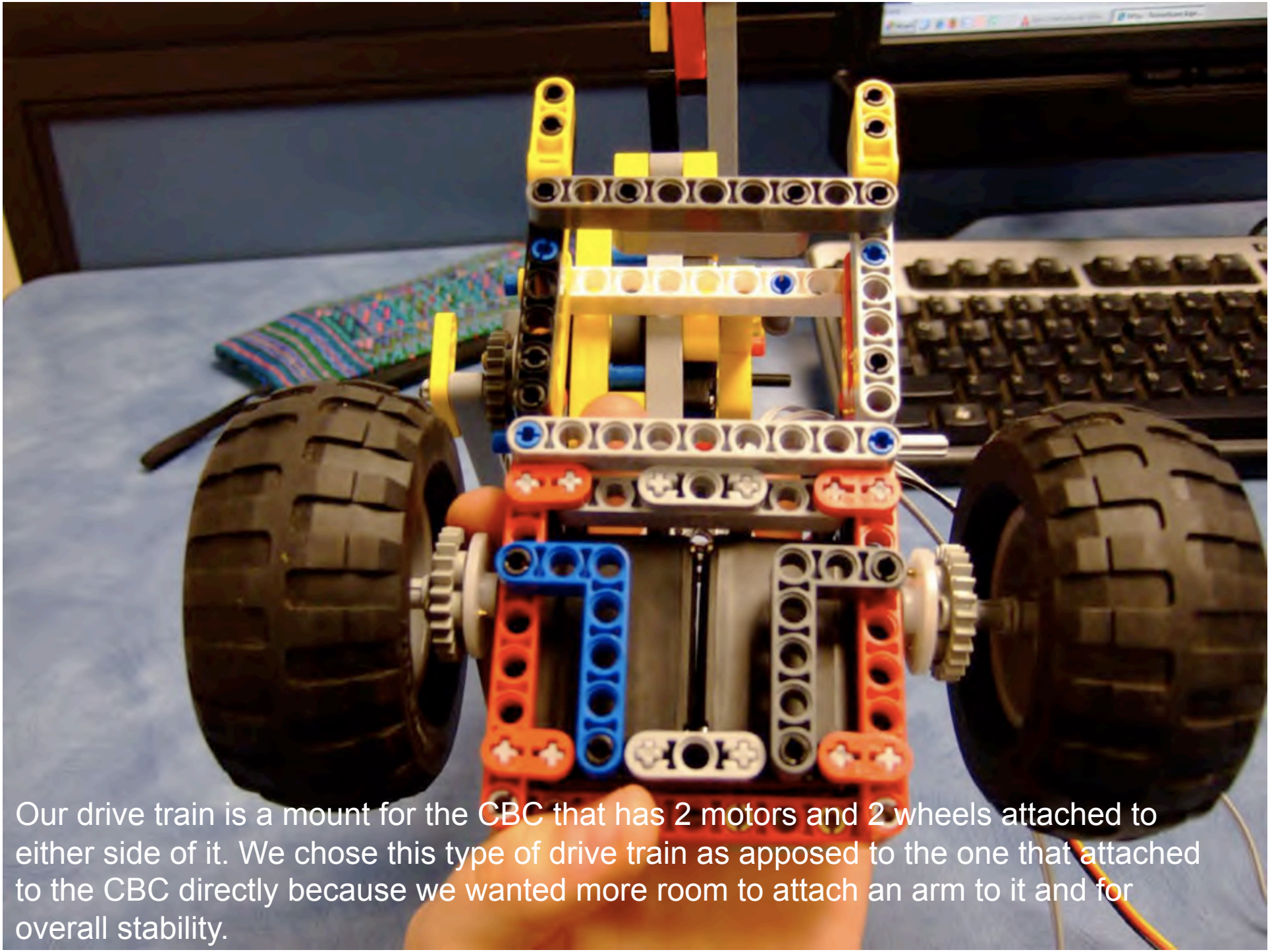
Drive Trains



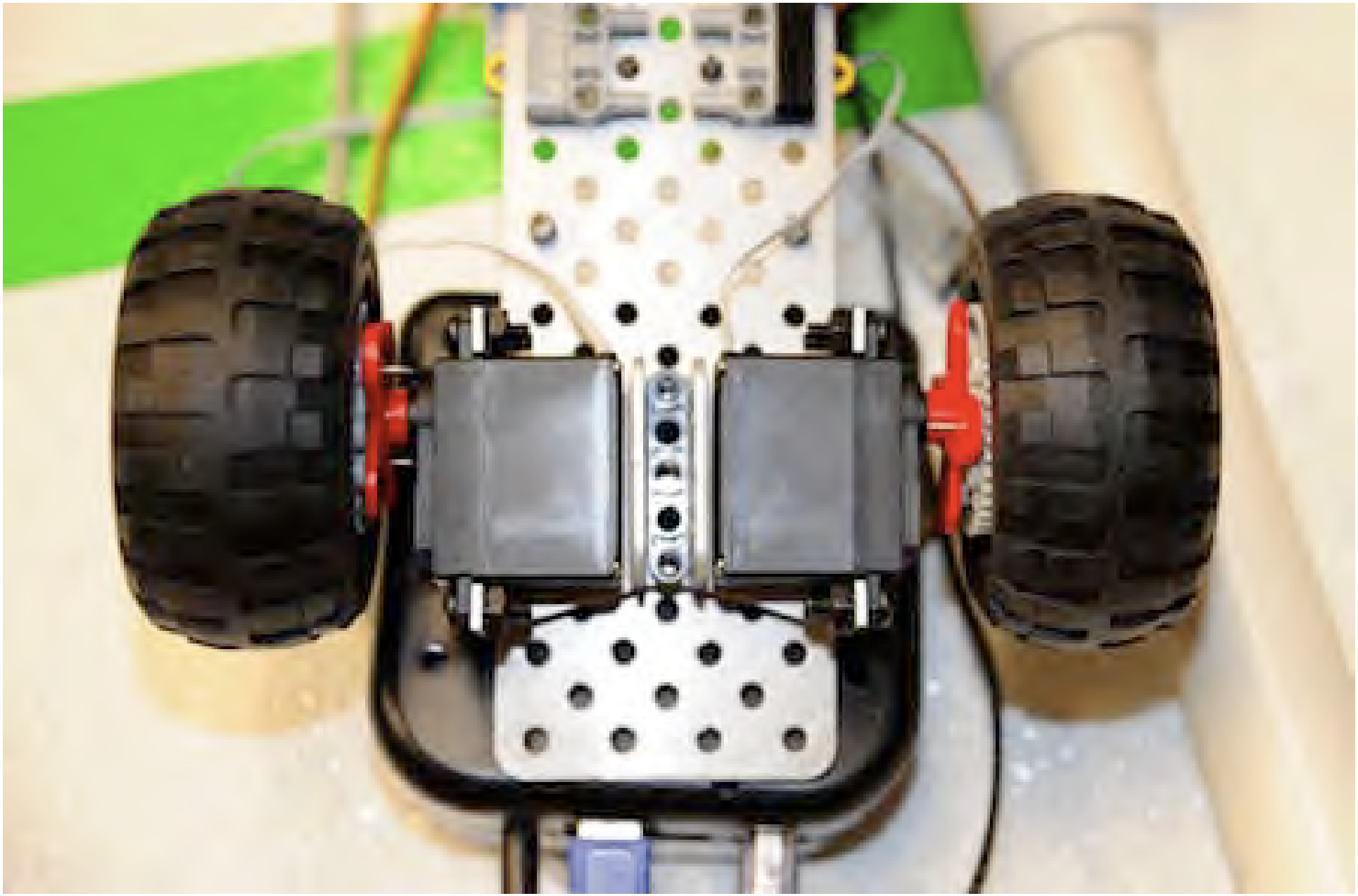


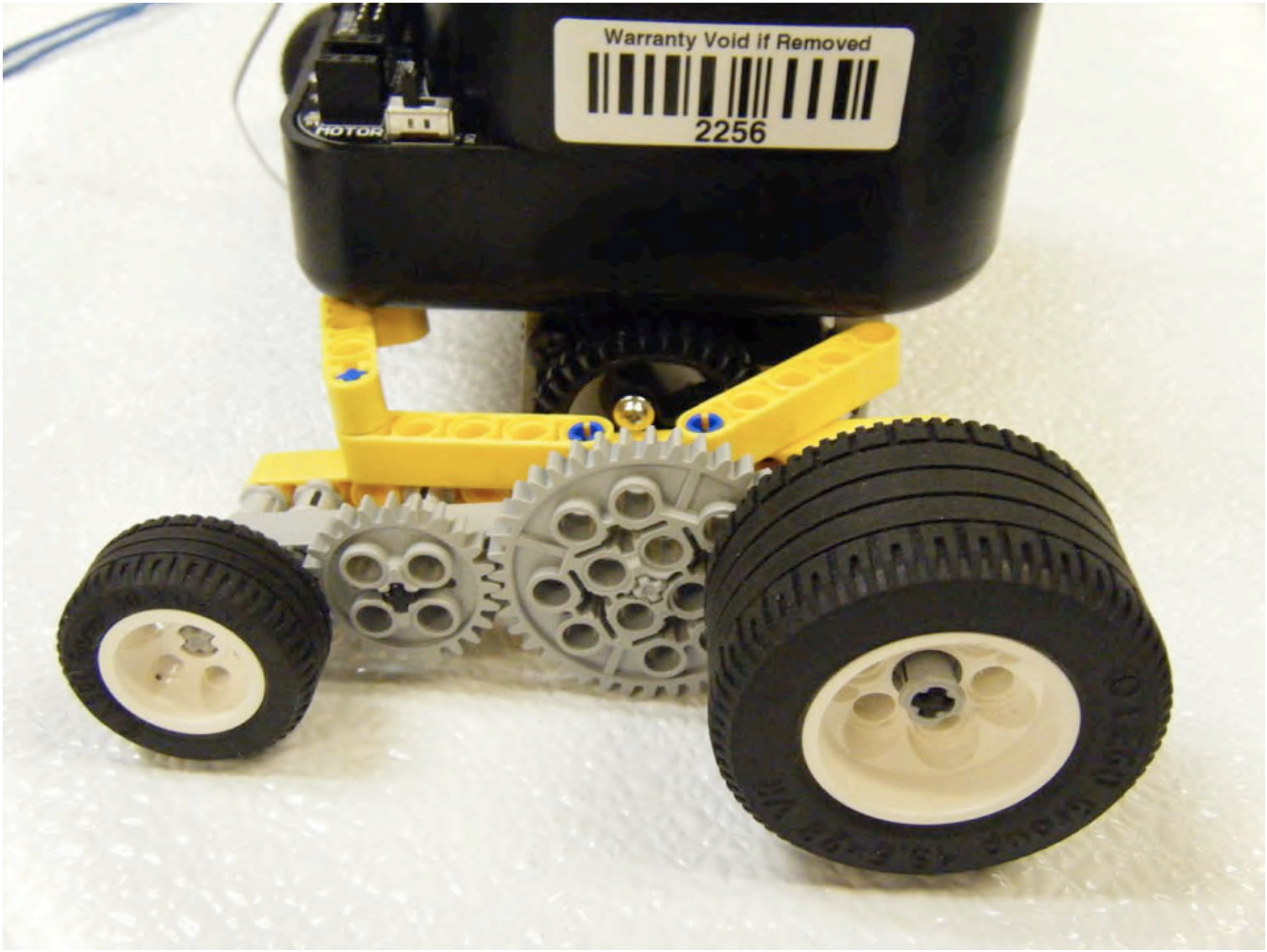
This lego based robot is driven by two continuous motion servos mounted nearly
back to back. The motors and chassis strengthen and support each other by using
only aluminum parts and bolts as fasteners. Each motor is encased in the provided
servo mounts, which are then connected directly onto two U shaped rails. The rails
are bolted together in multiple places, giving the motors a solid, reliable connection
to the frame of the robot. Each motor is spinning a red cross shaped flywheel, which
is screwed onto a lego gear. The lego gear on each side is then connected to a
wheel by three lego axles and collars on the exterior.

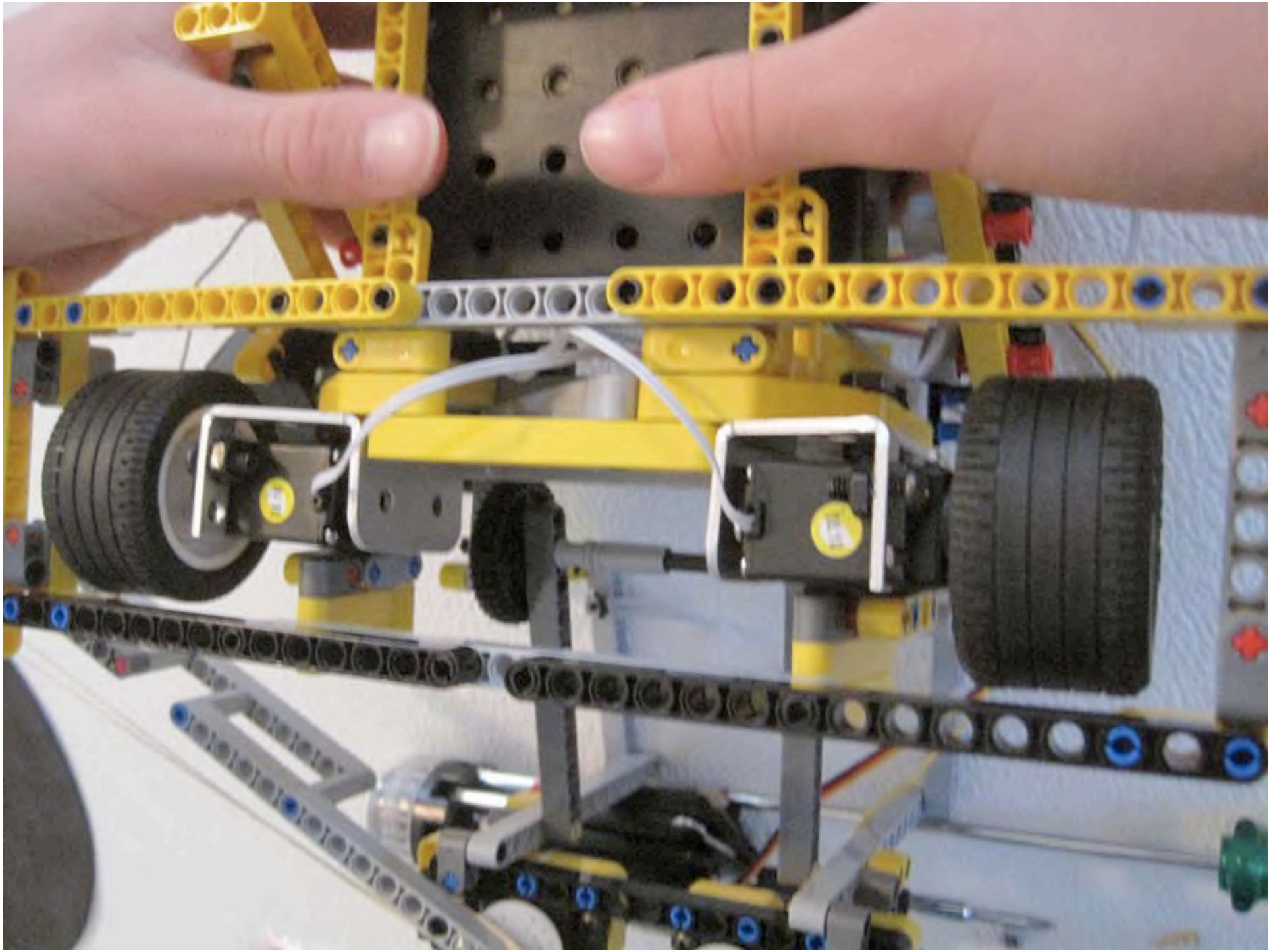


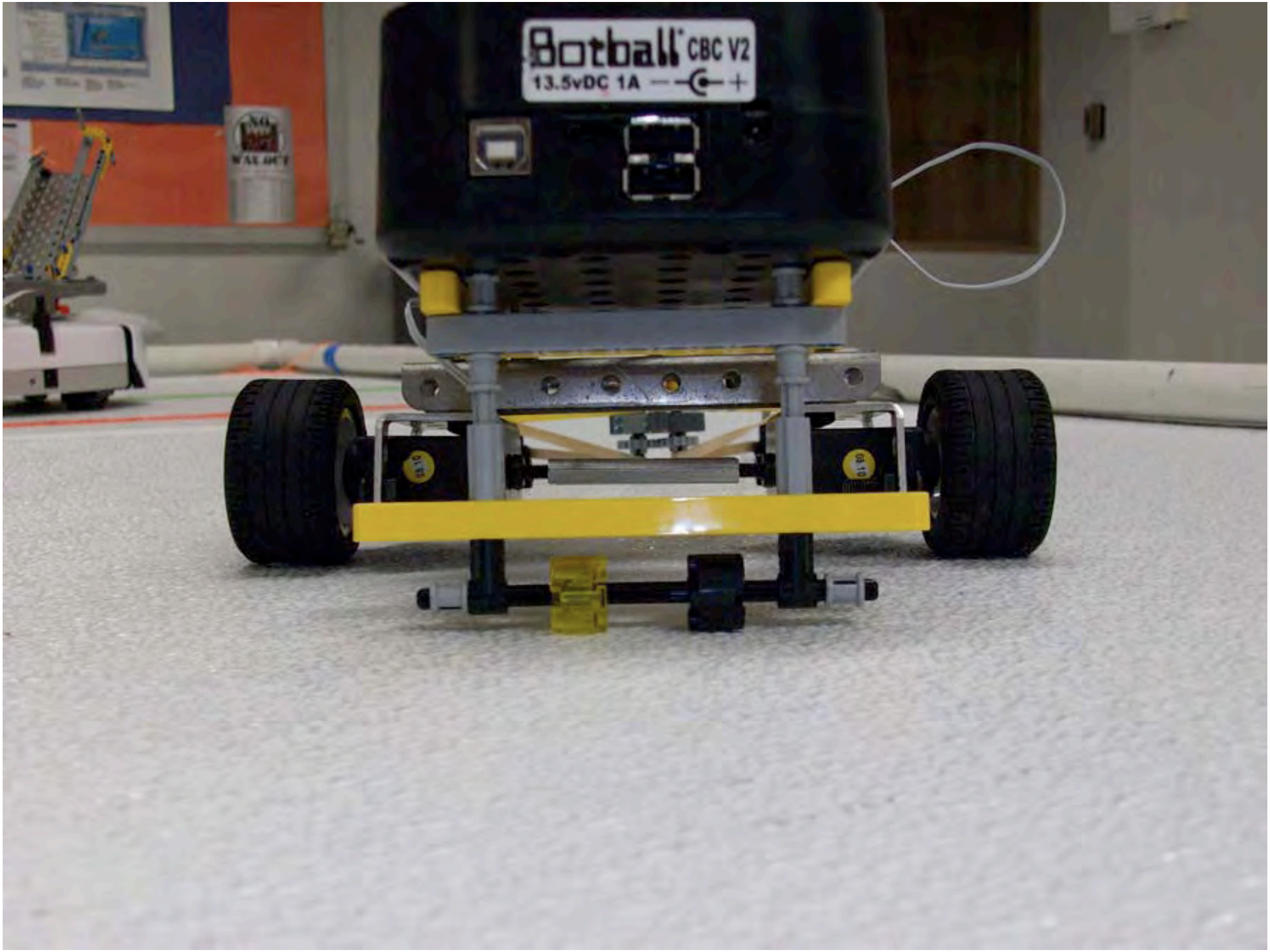


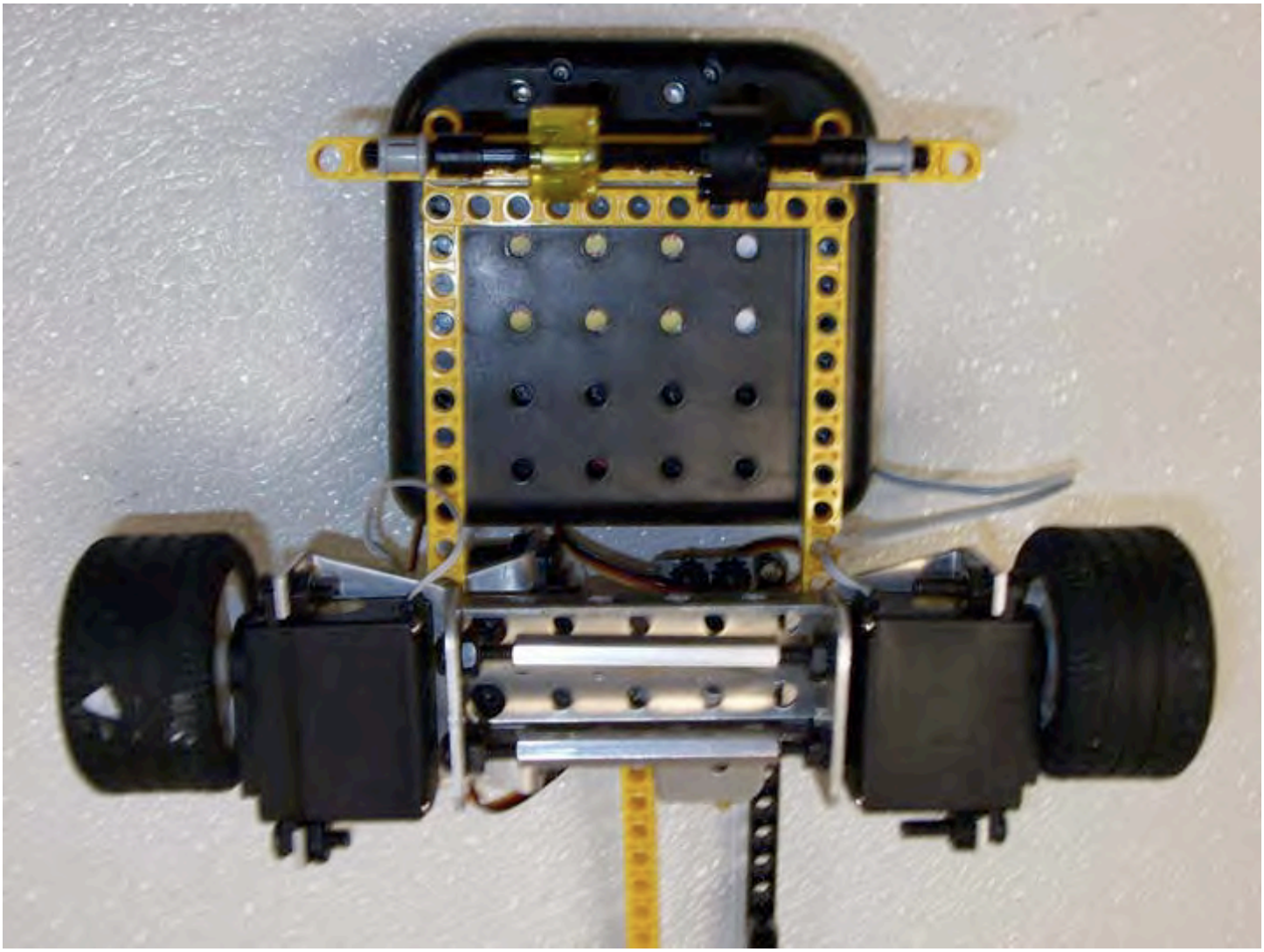
Our drive train is a mount for the CBC that has 2 motors and 2 wheels attached to either side of it. We chose this type of drive train as apposed to the one that attached to the CBC directly because we wanted more room to attach an arm to it and for overall stability.

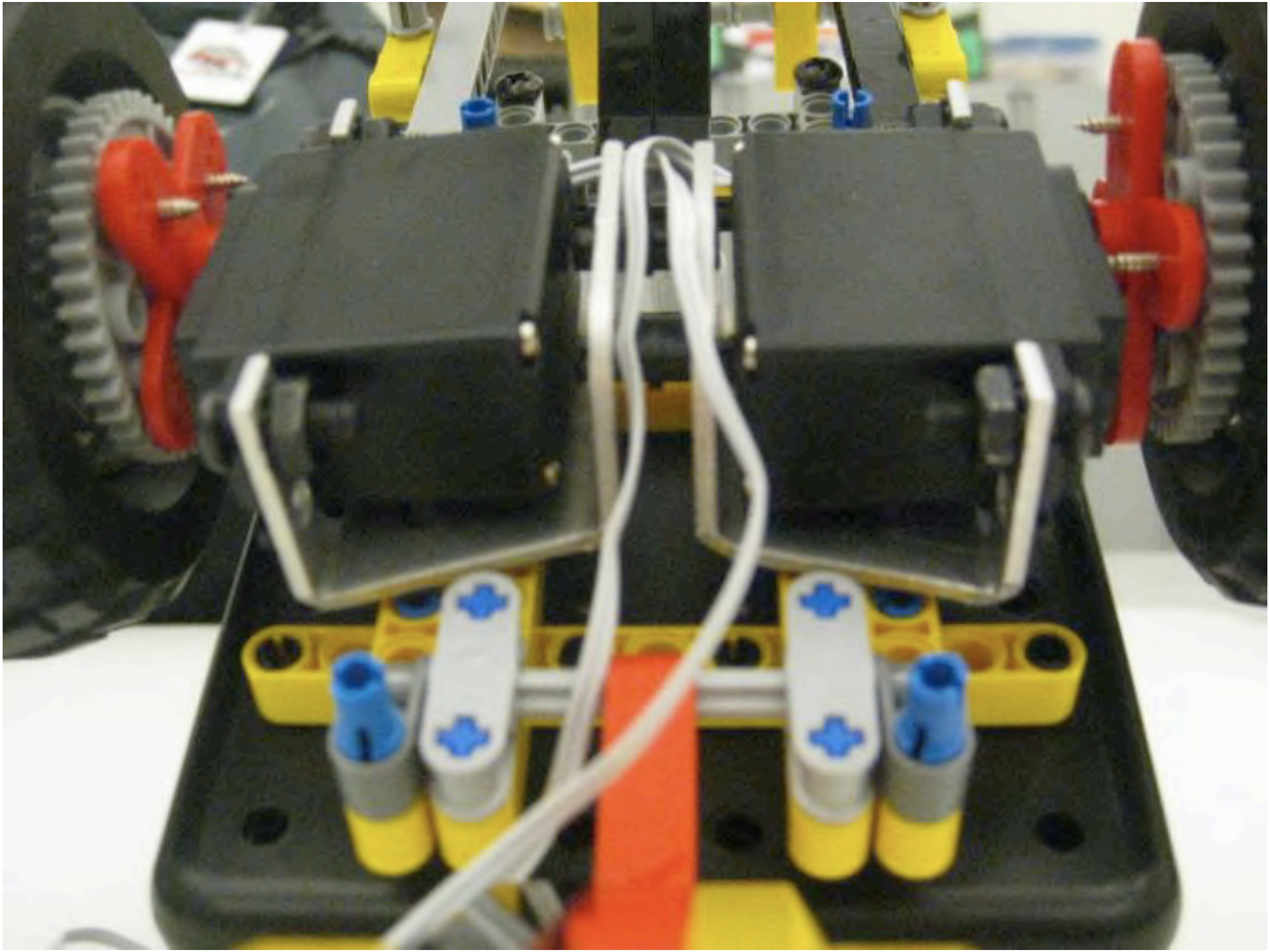


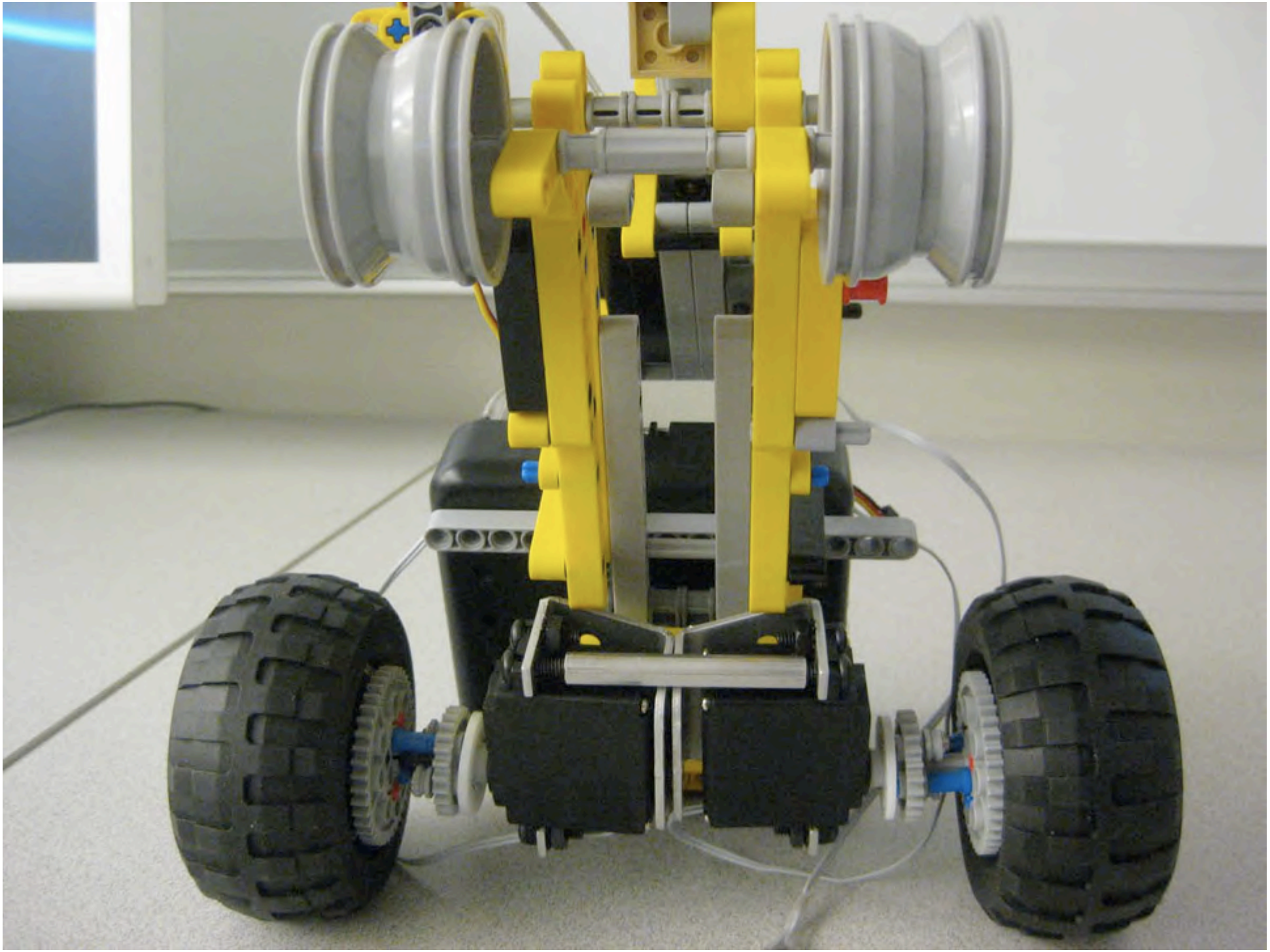

Warranty Void if Removed
2256
MOTOR

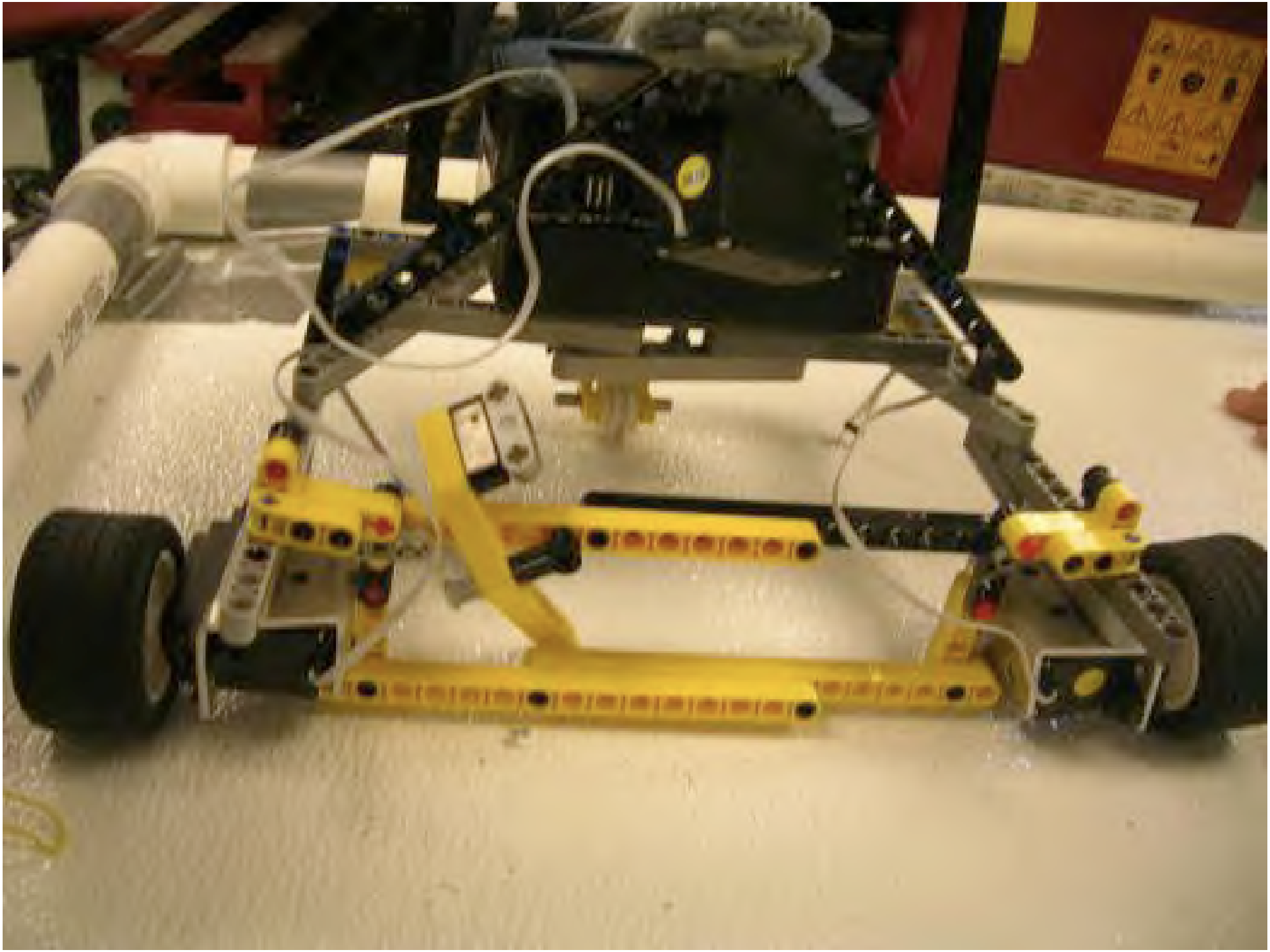


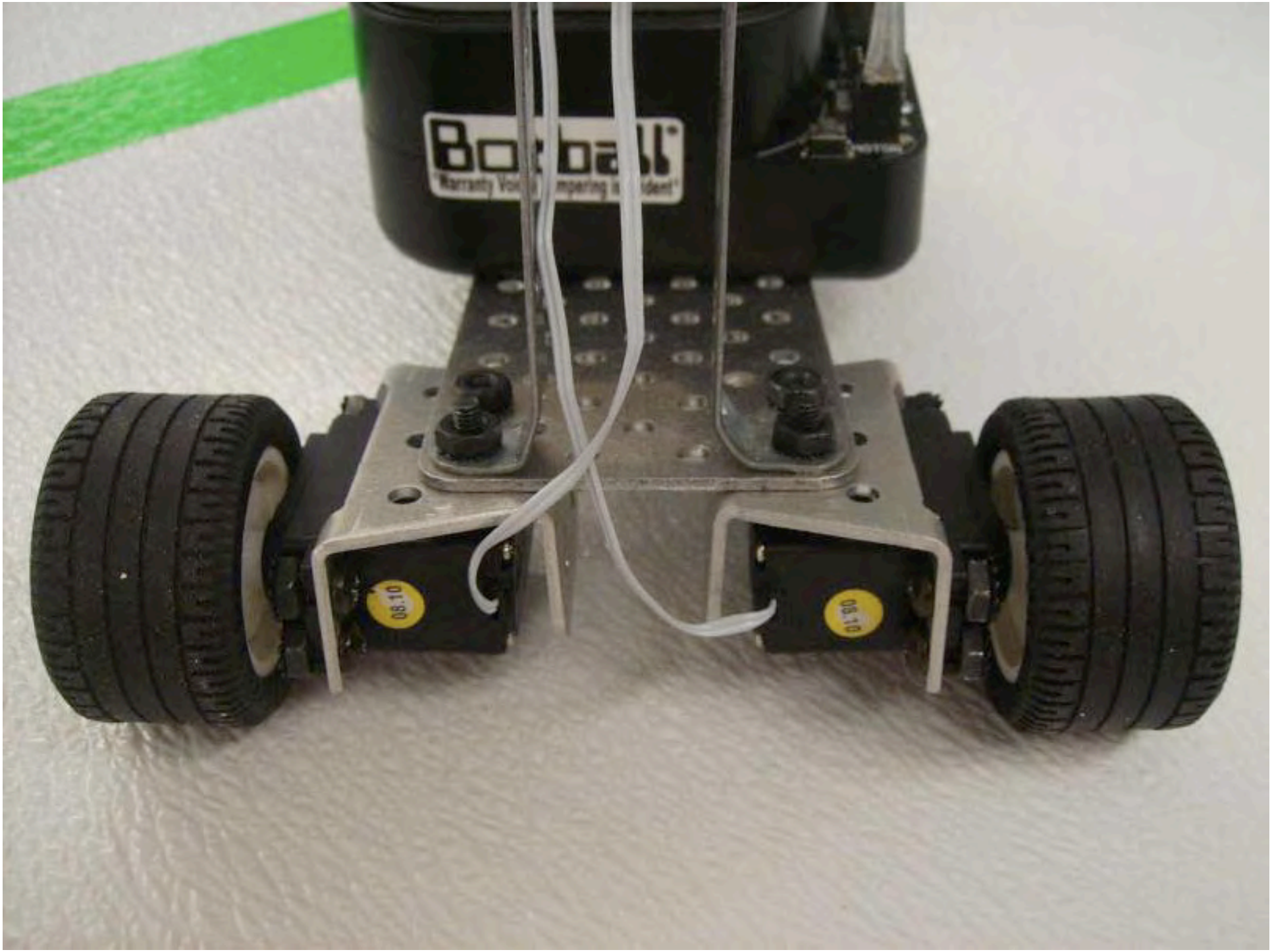

Botball CBC V2
13.5vDC 1A

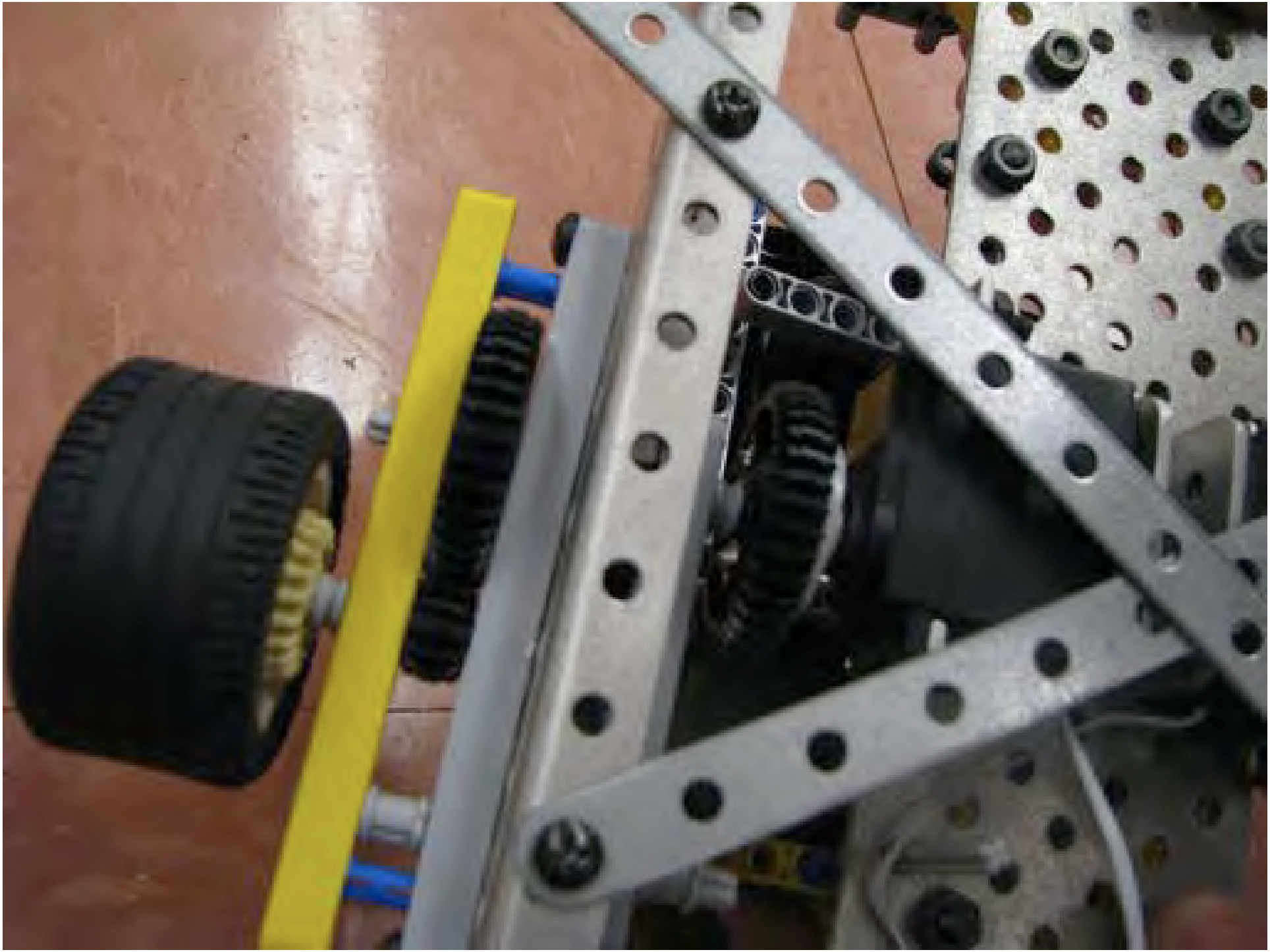


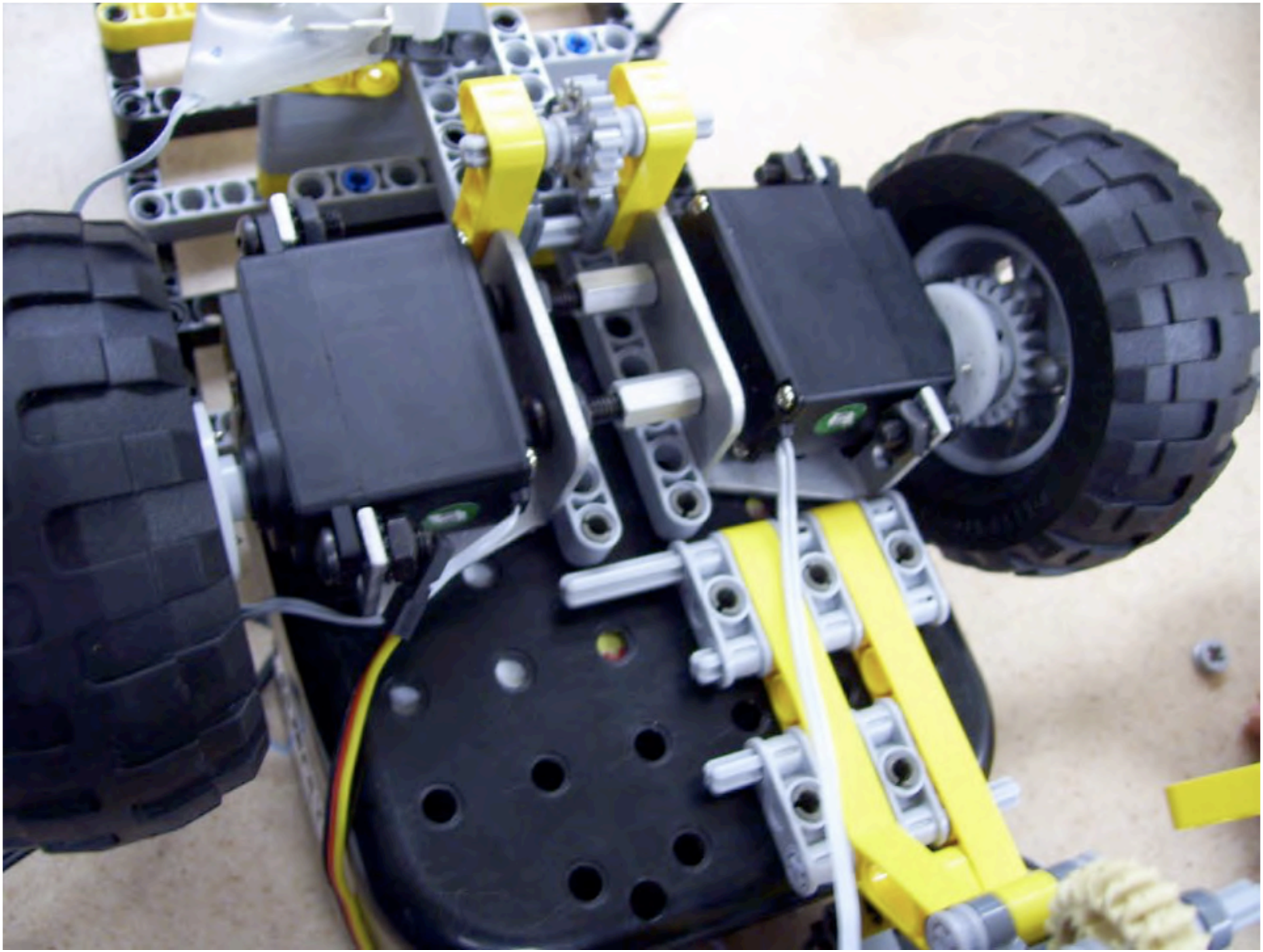


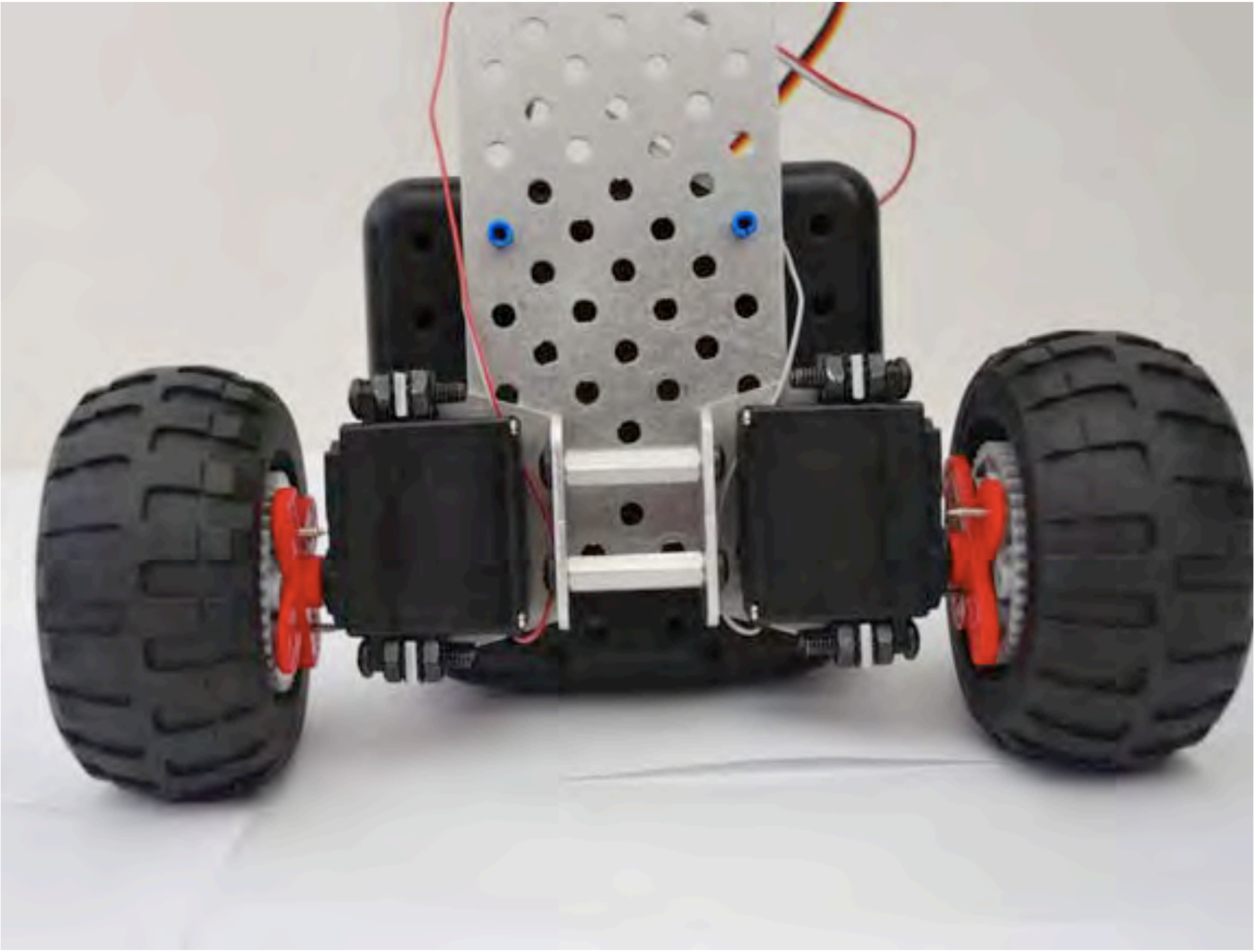


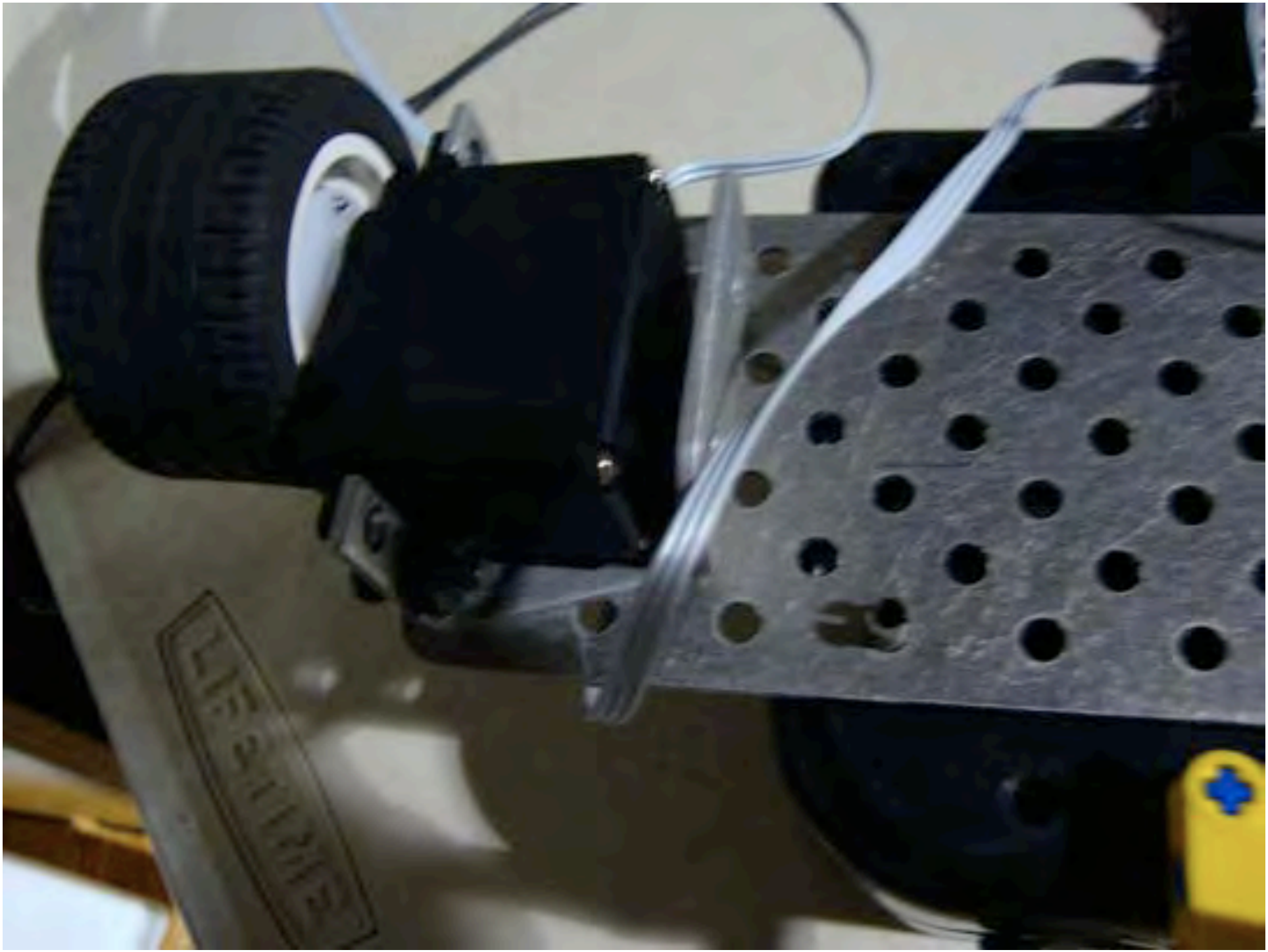


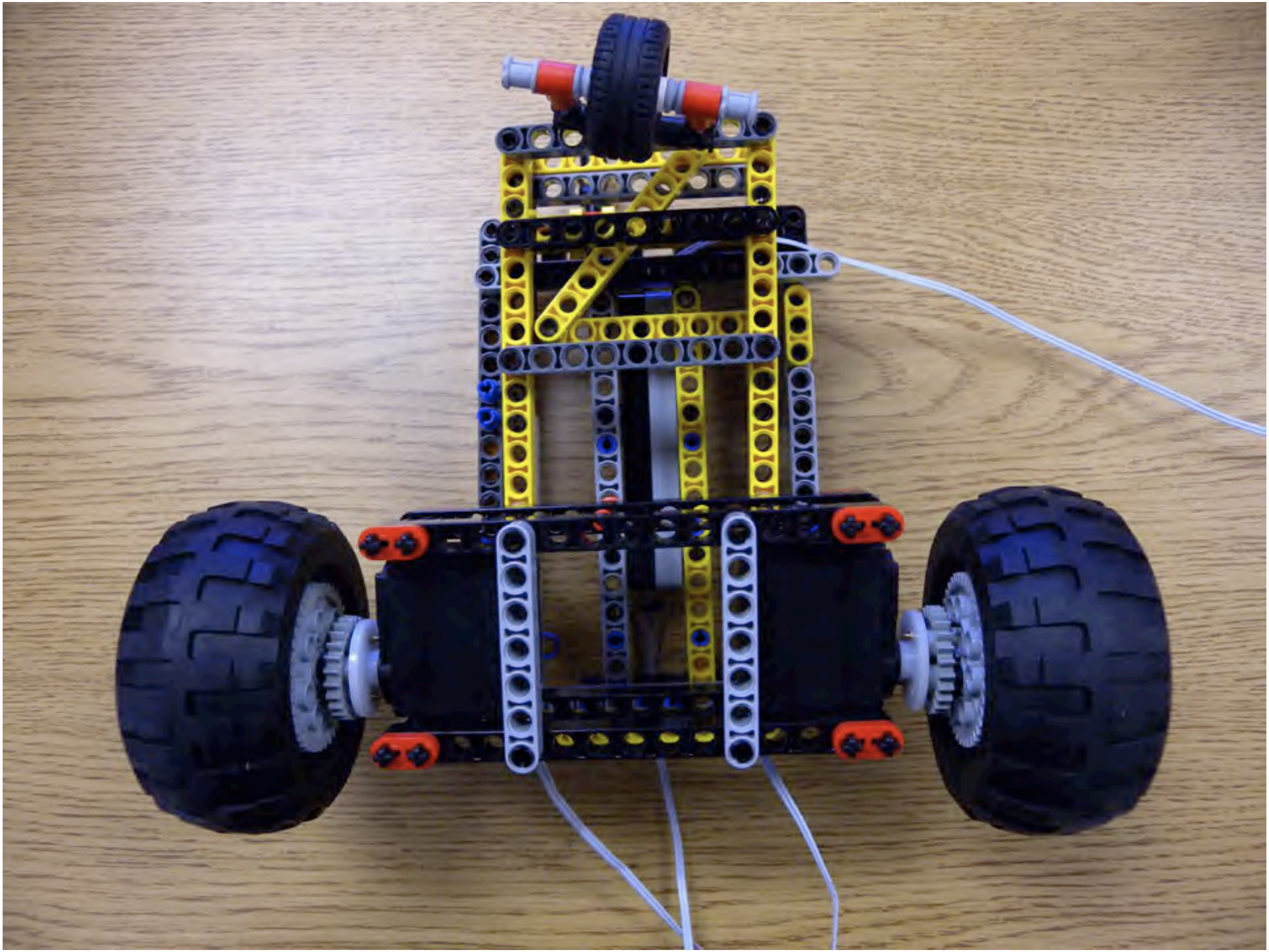

Bobcat

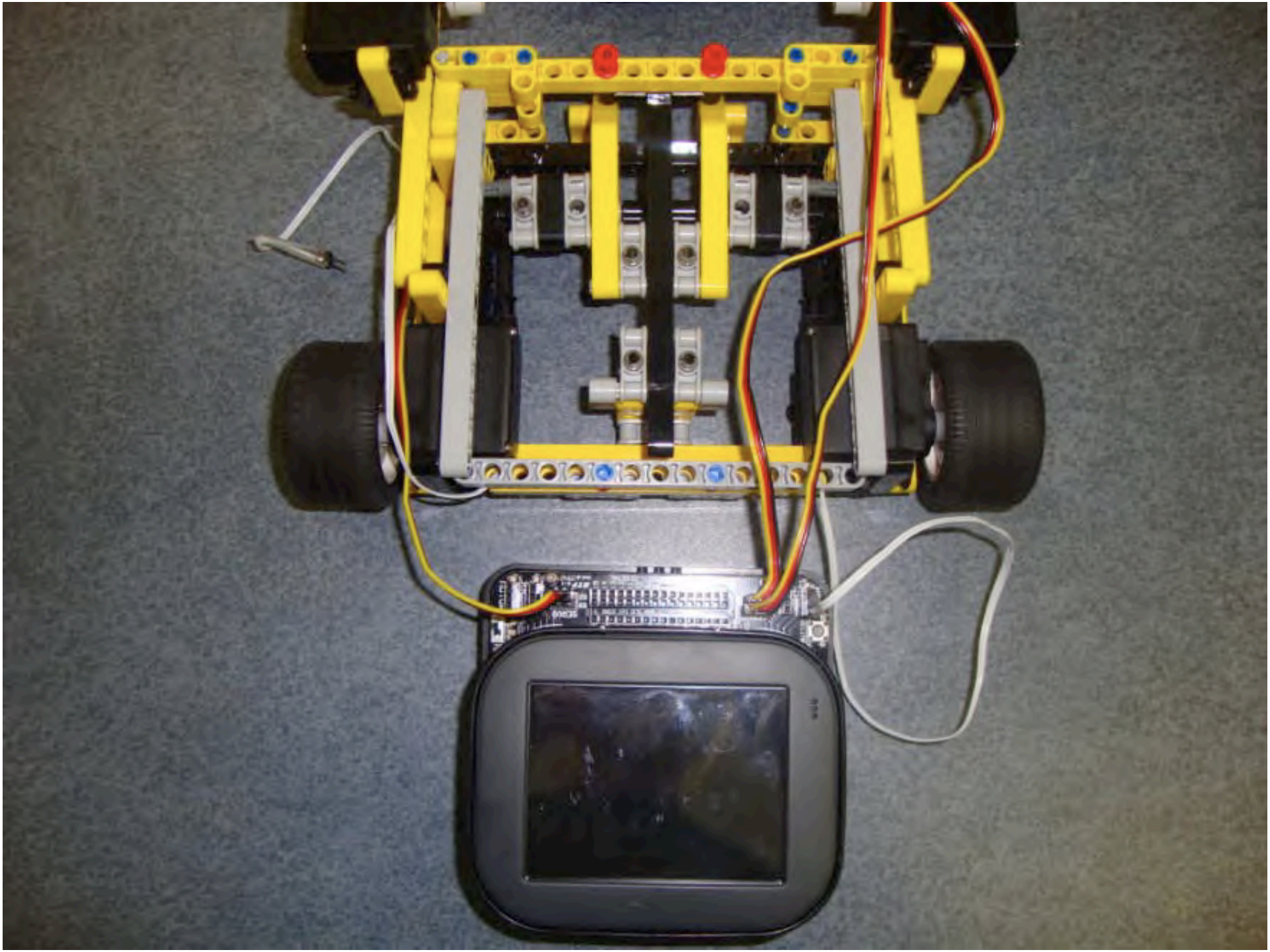


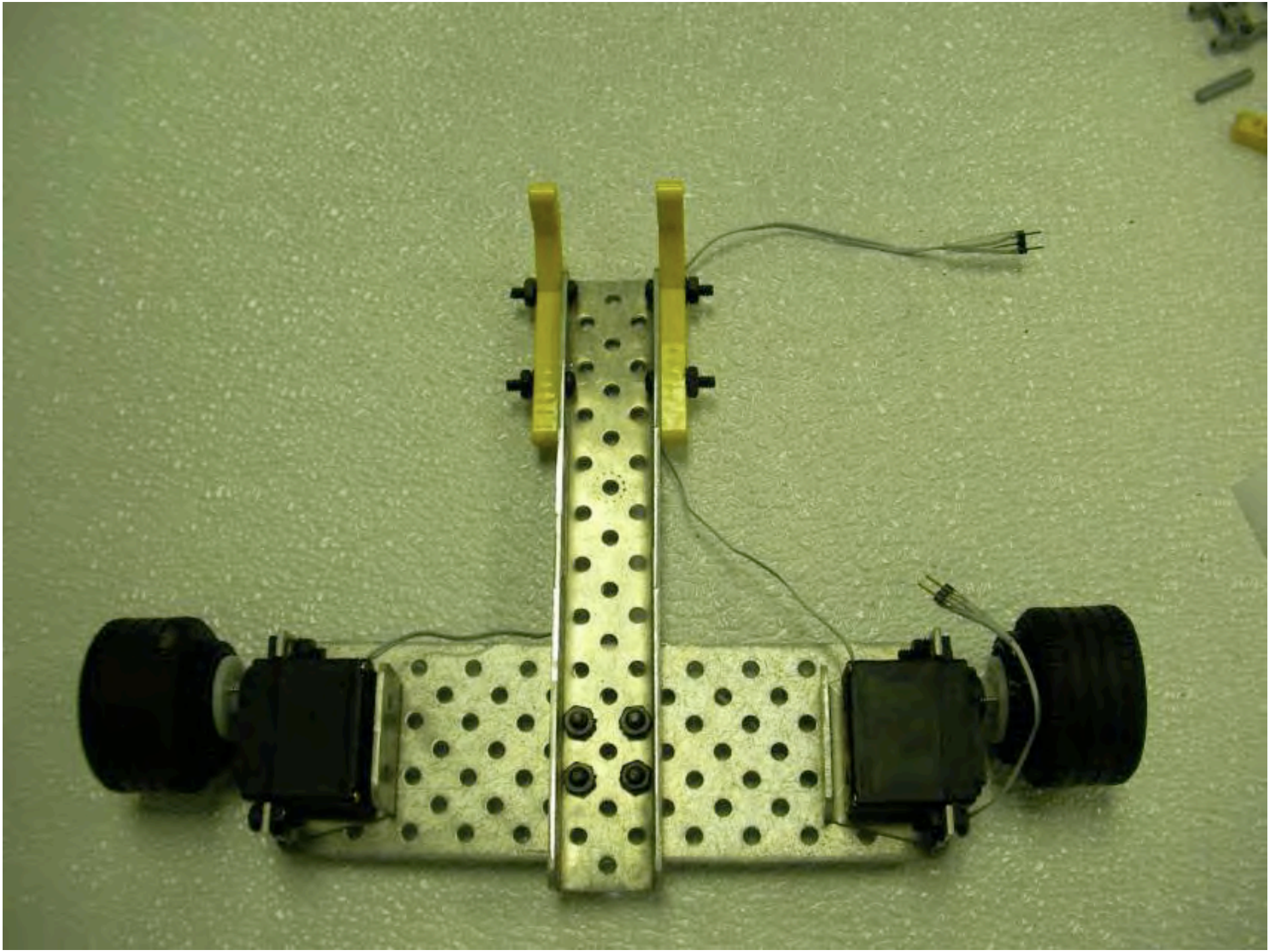


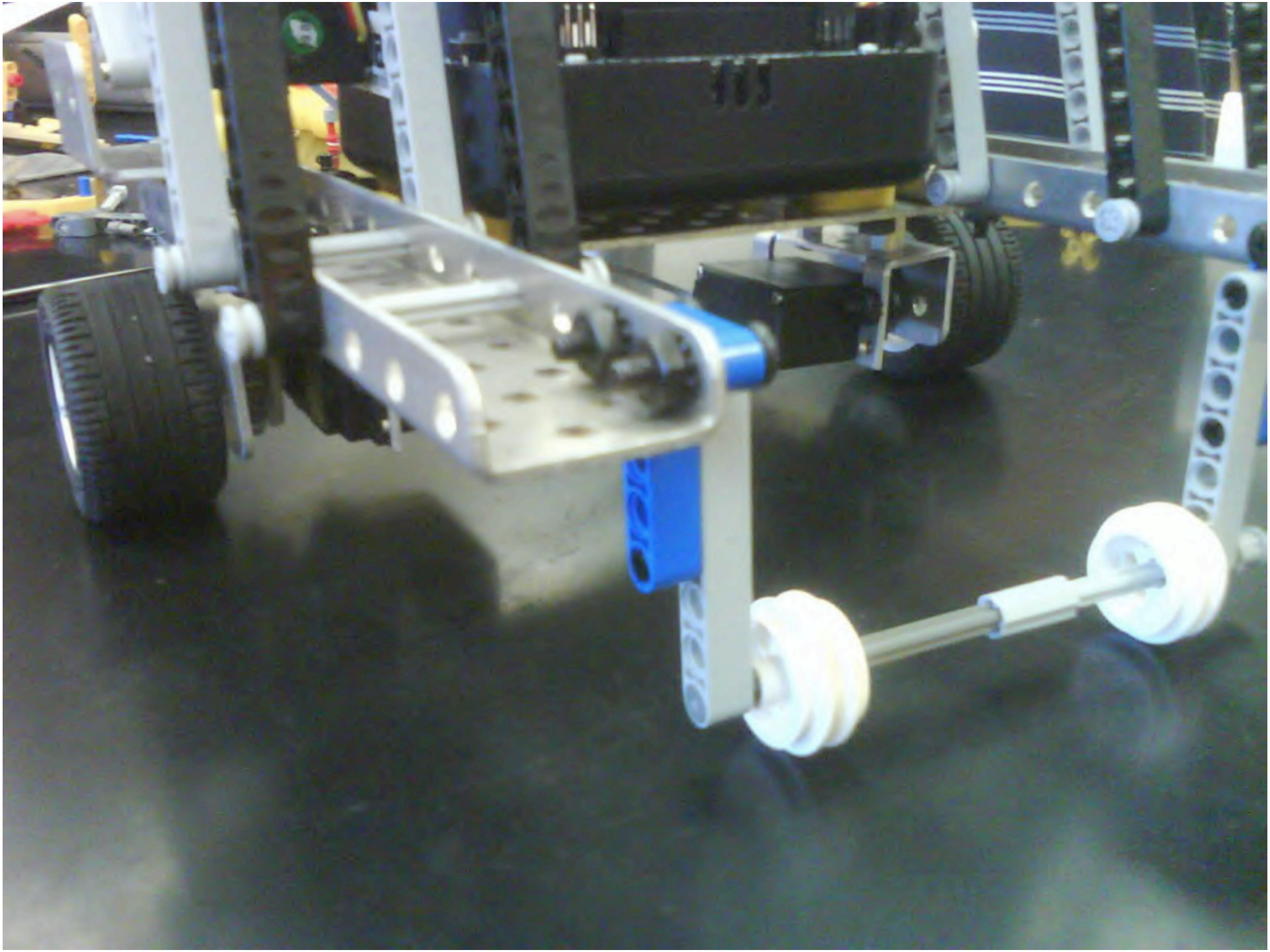


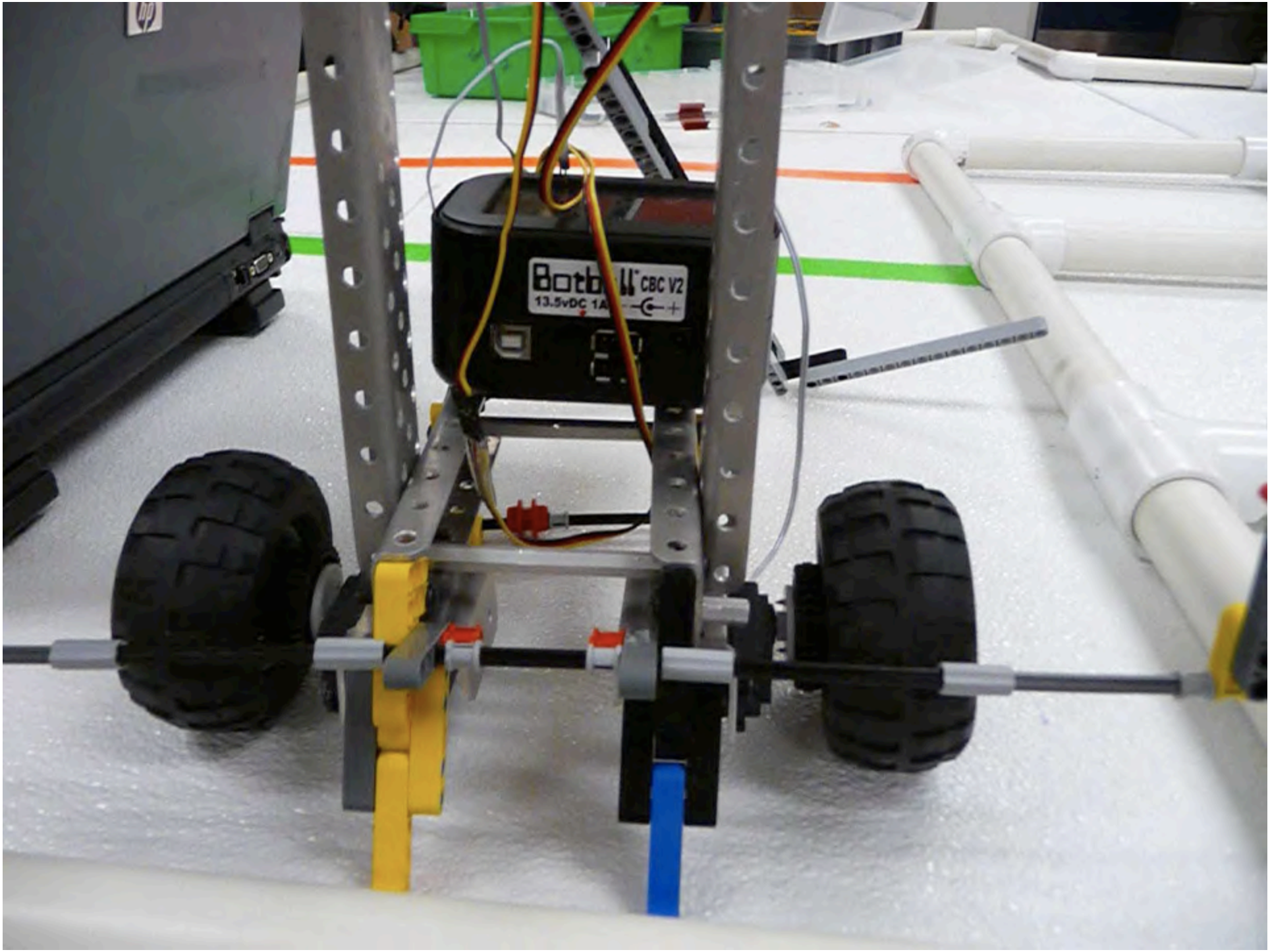


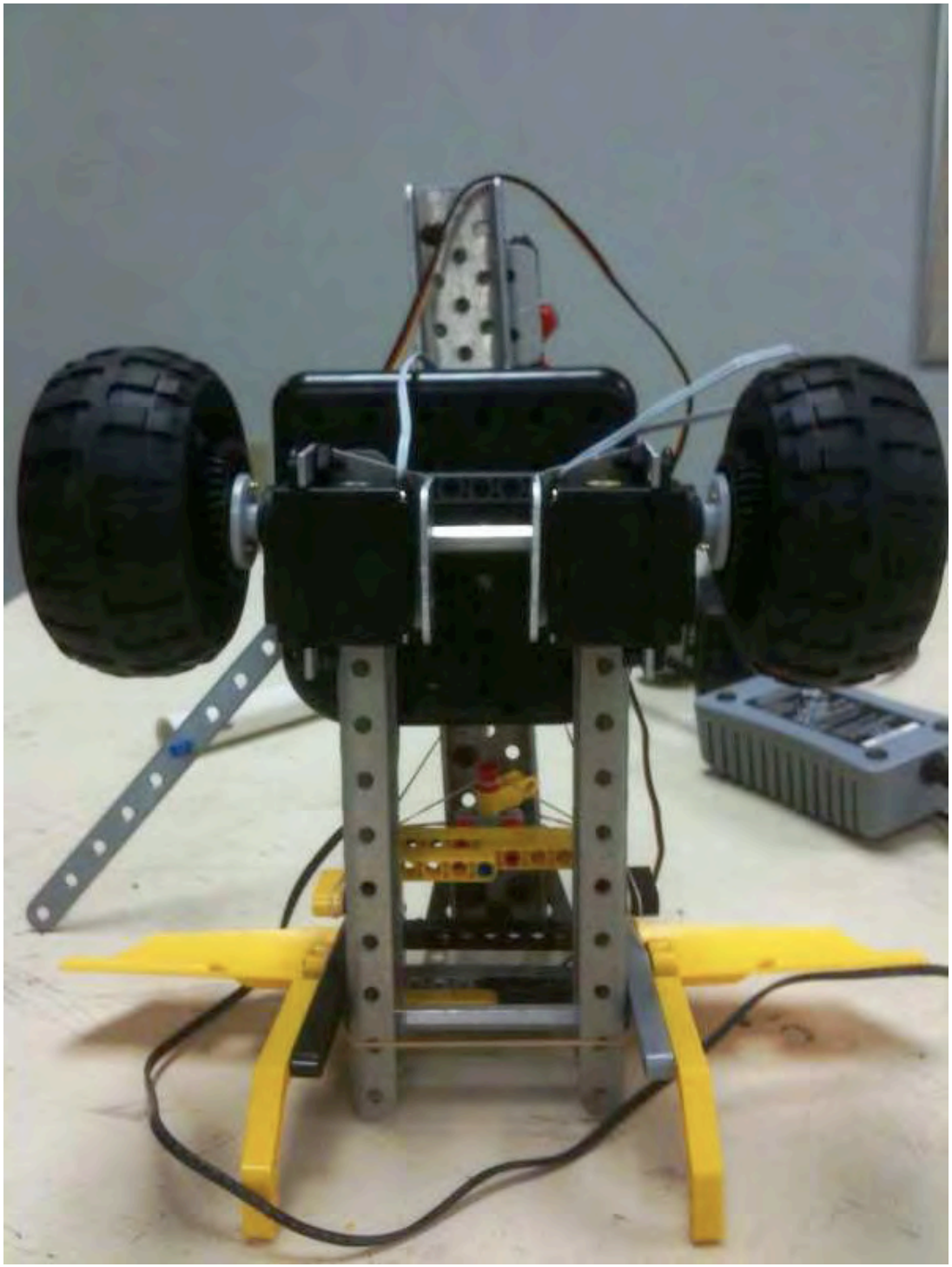


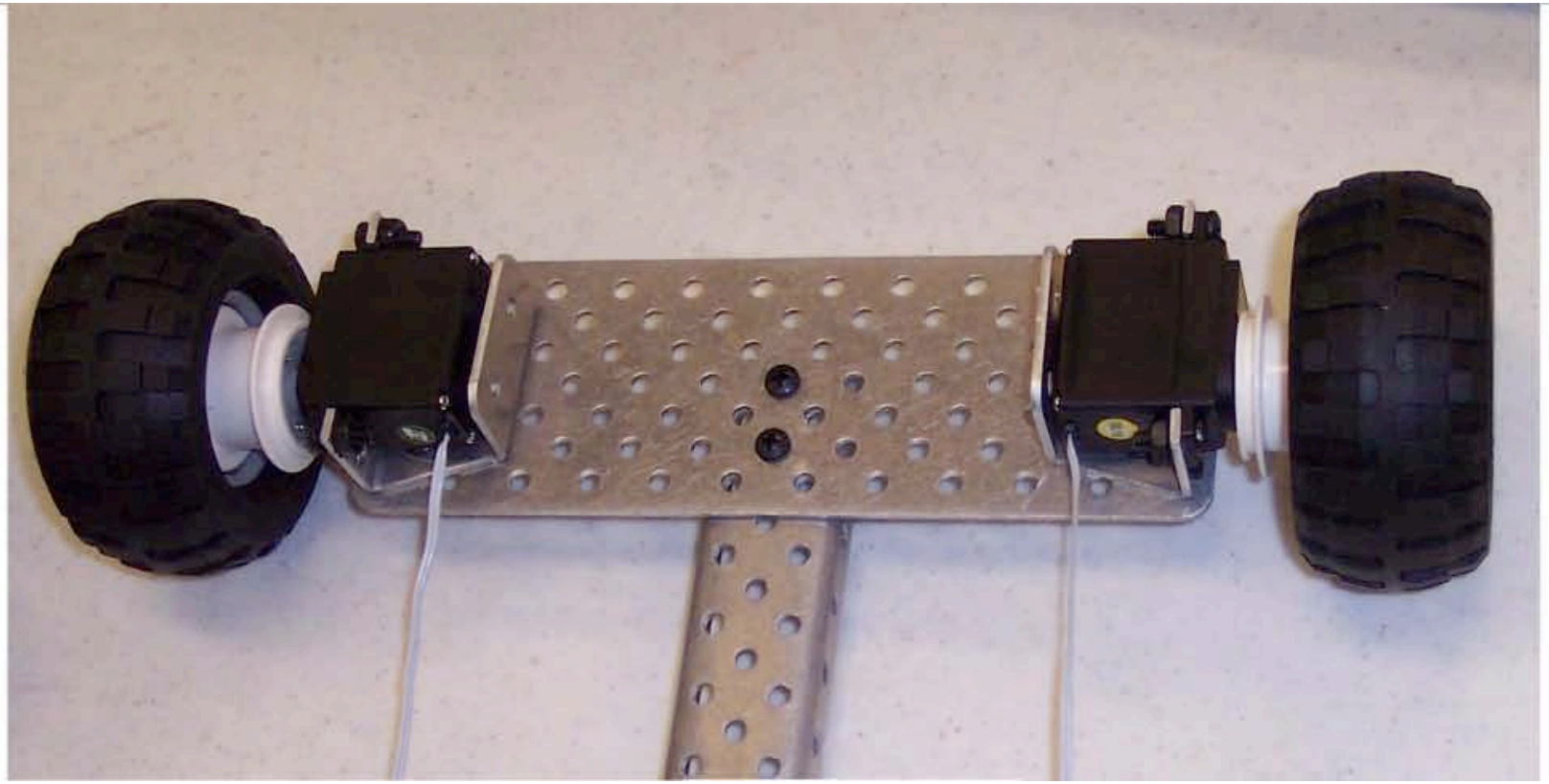


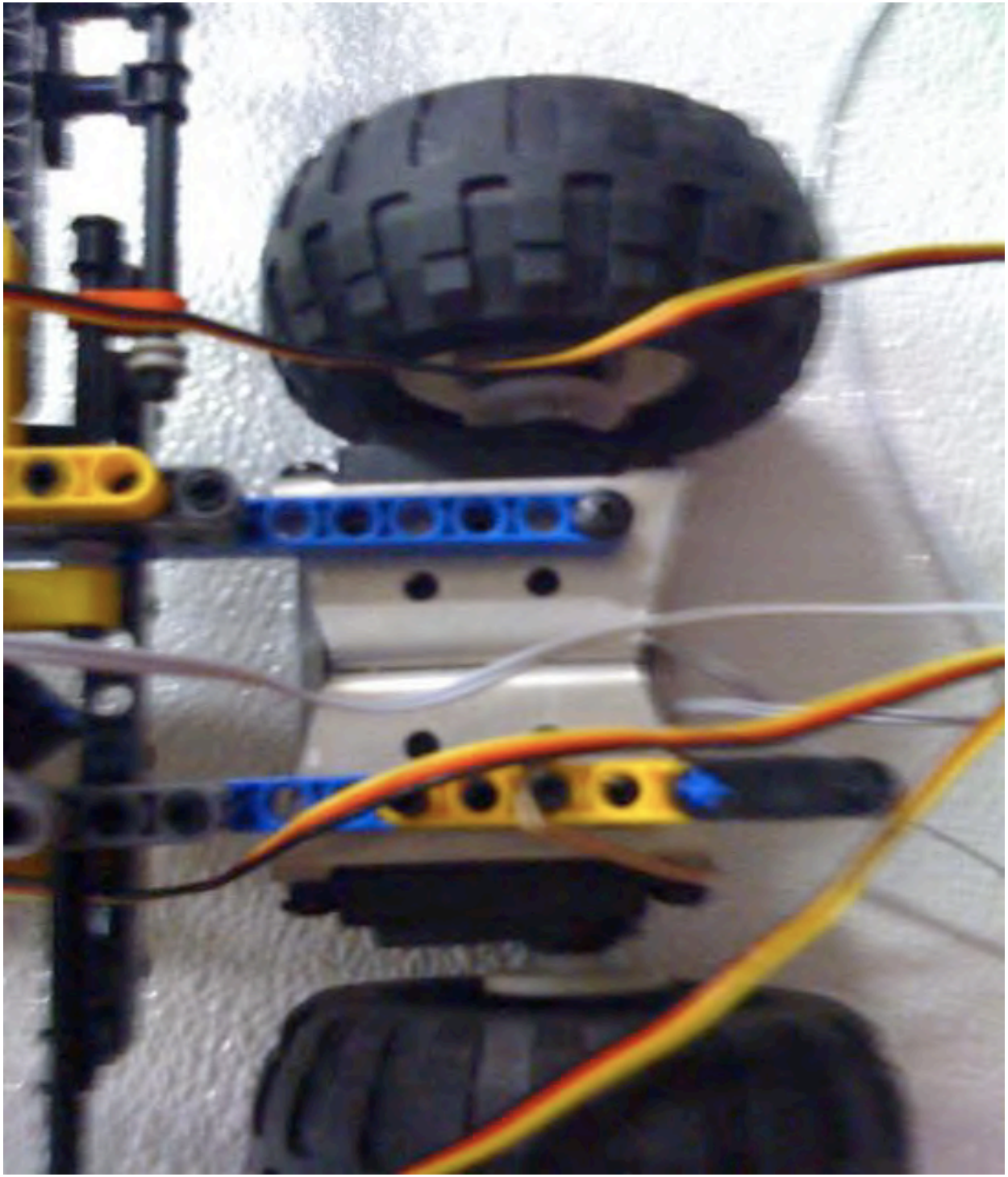


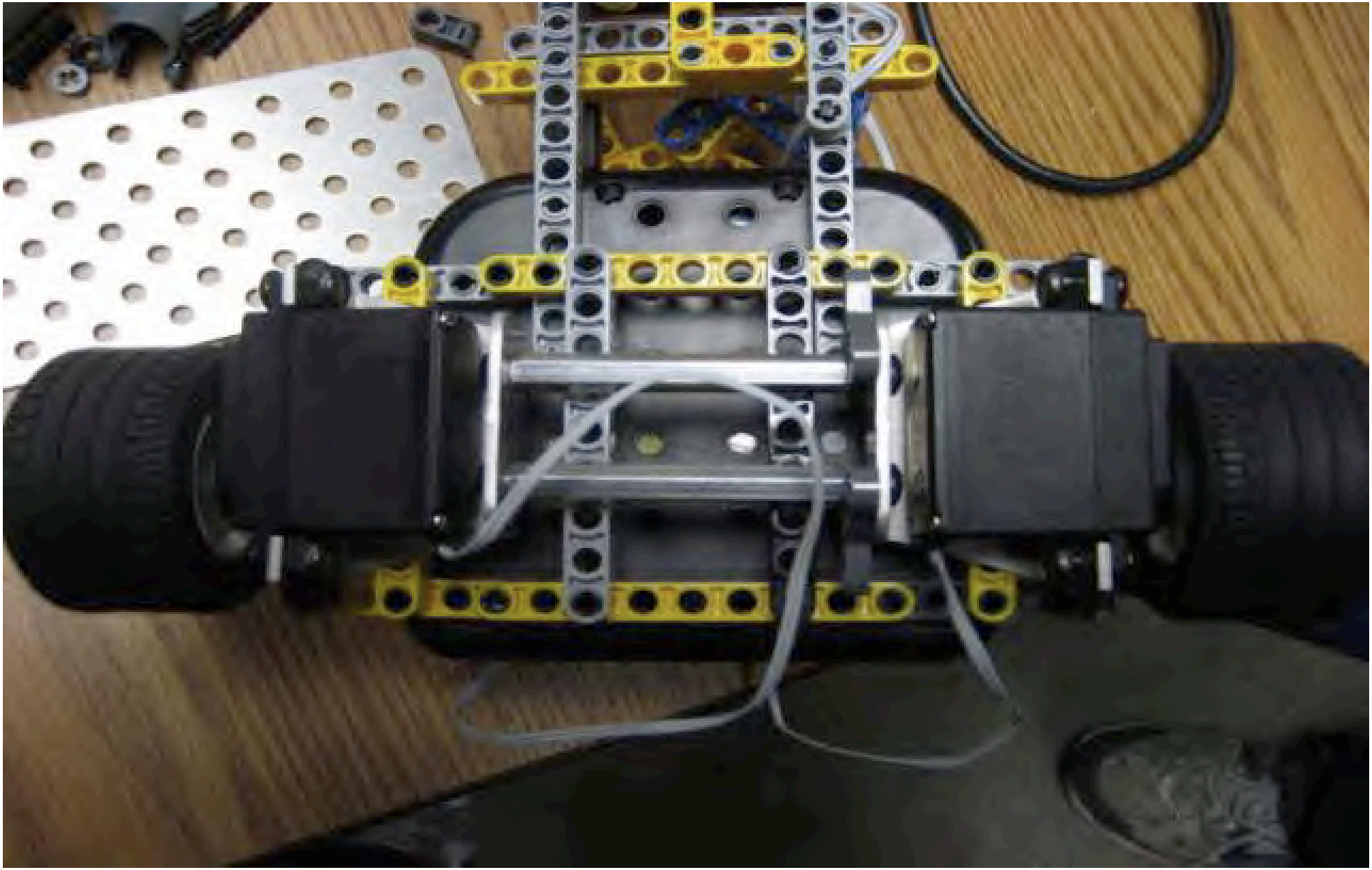


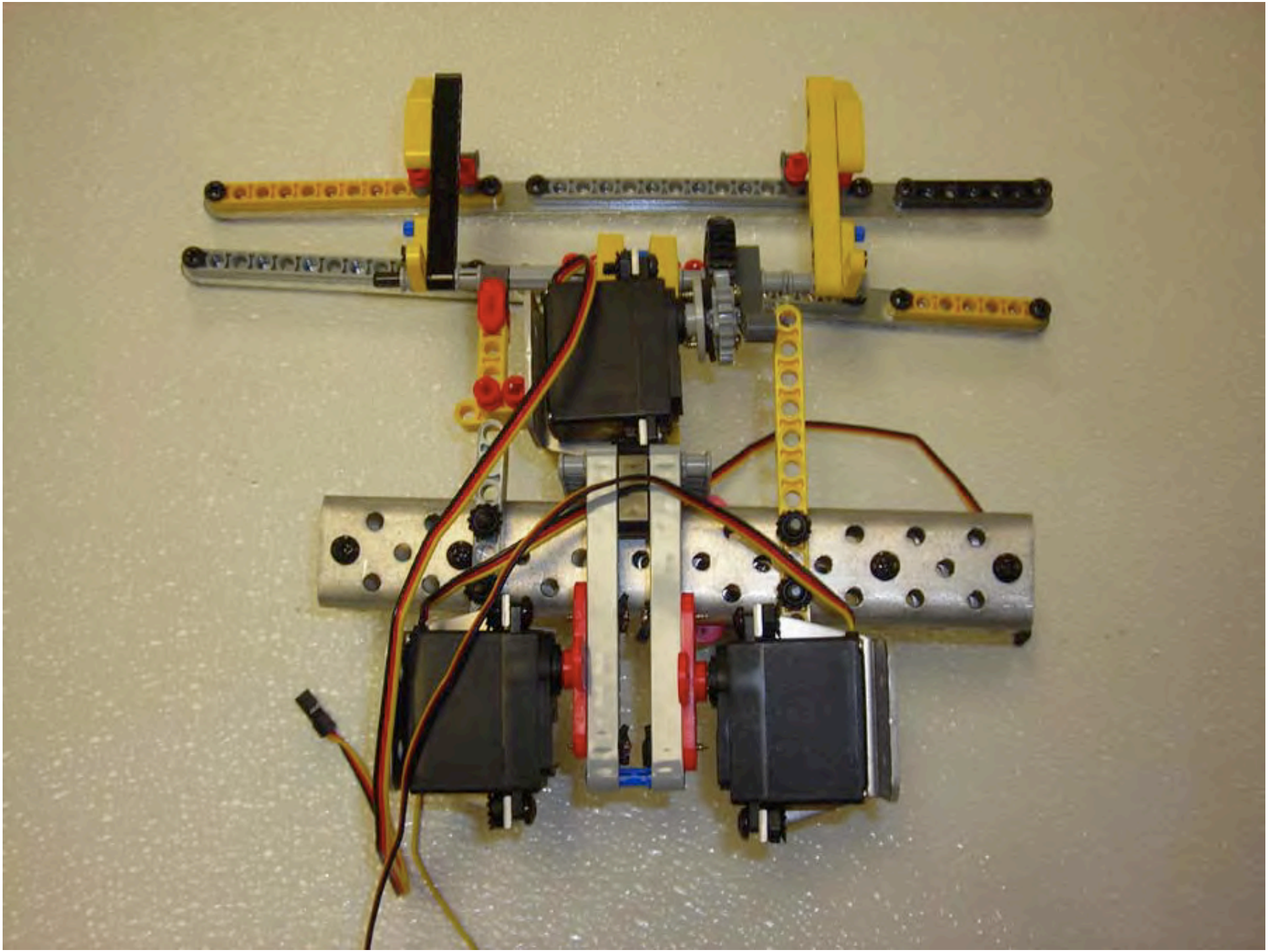

CBC V2
13.5vDC 1A

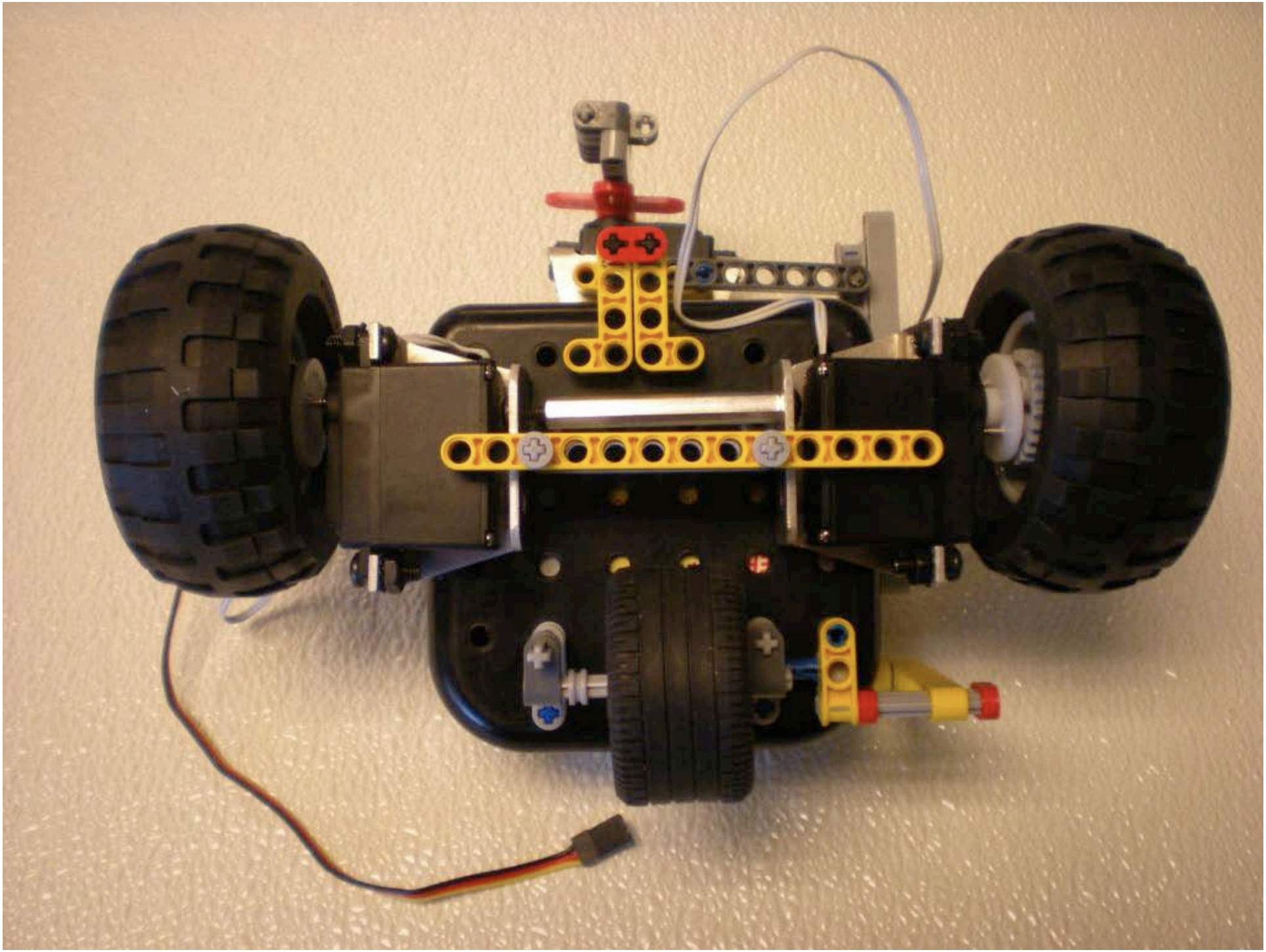


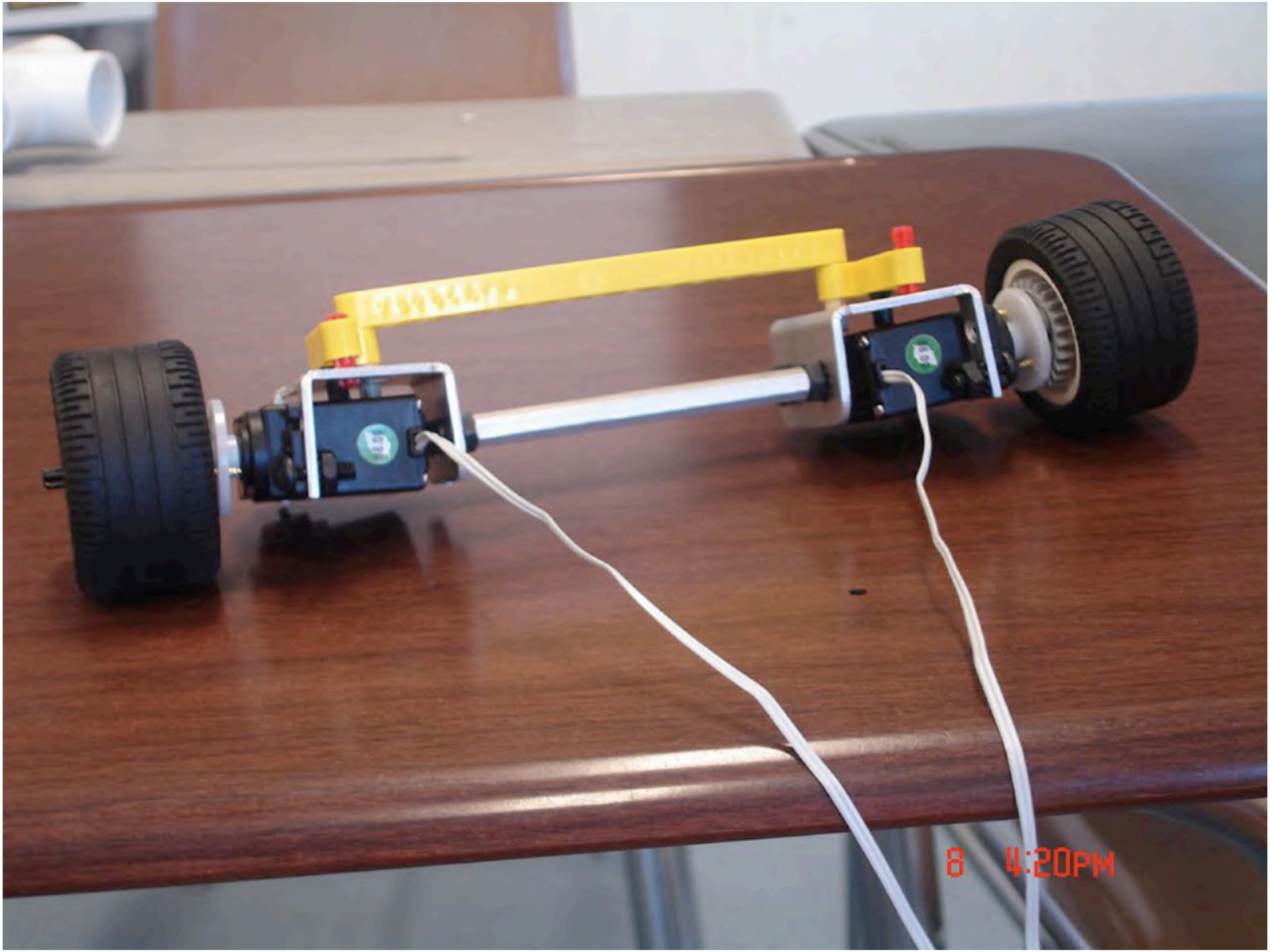


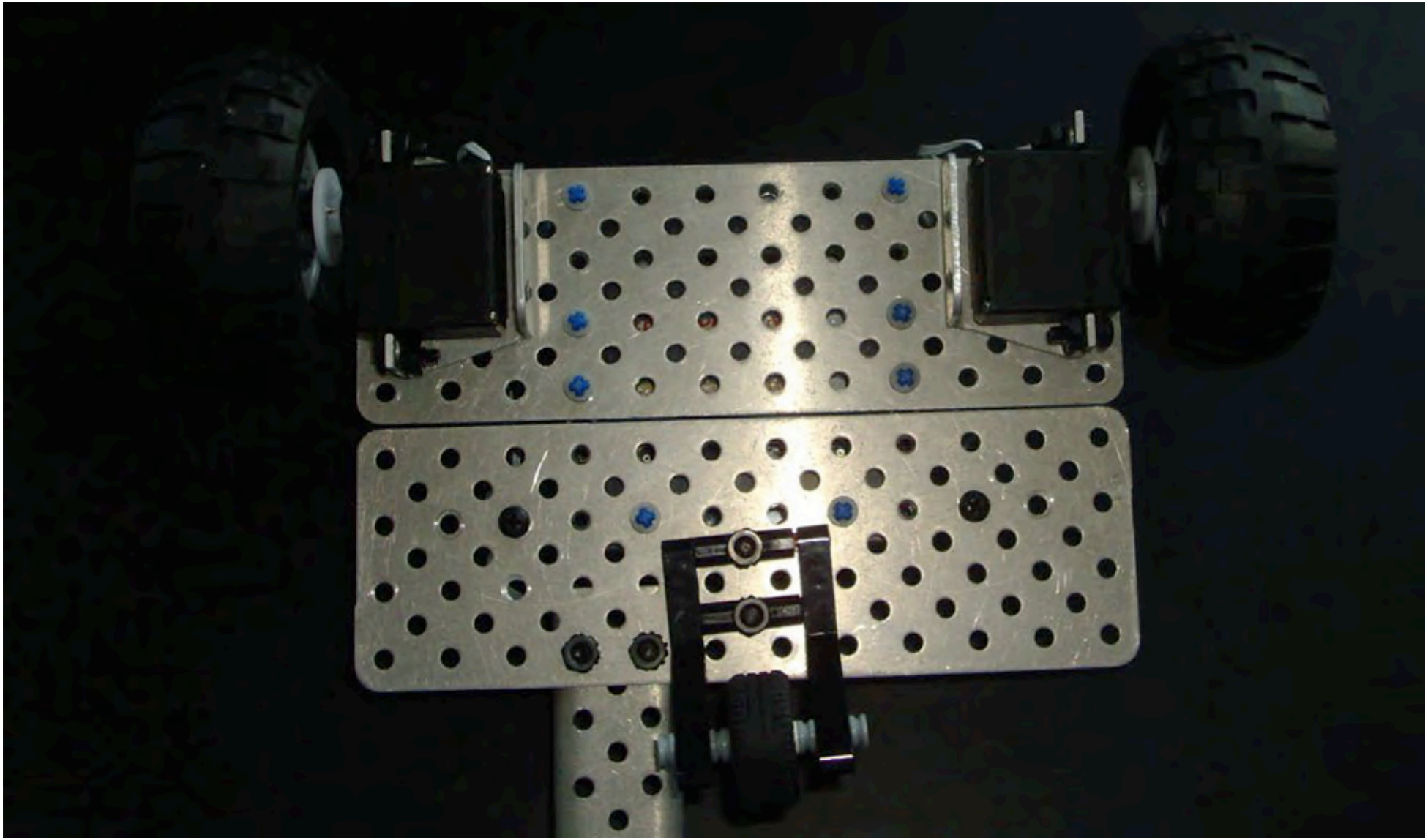


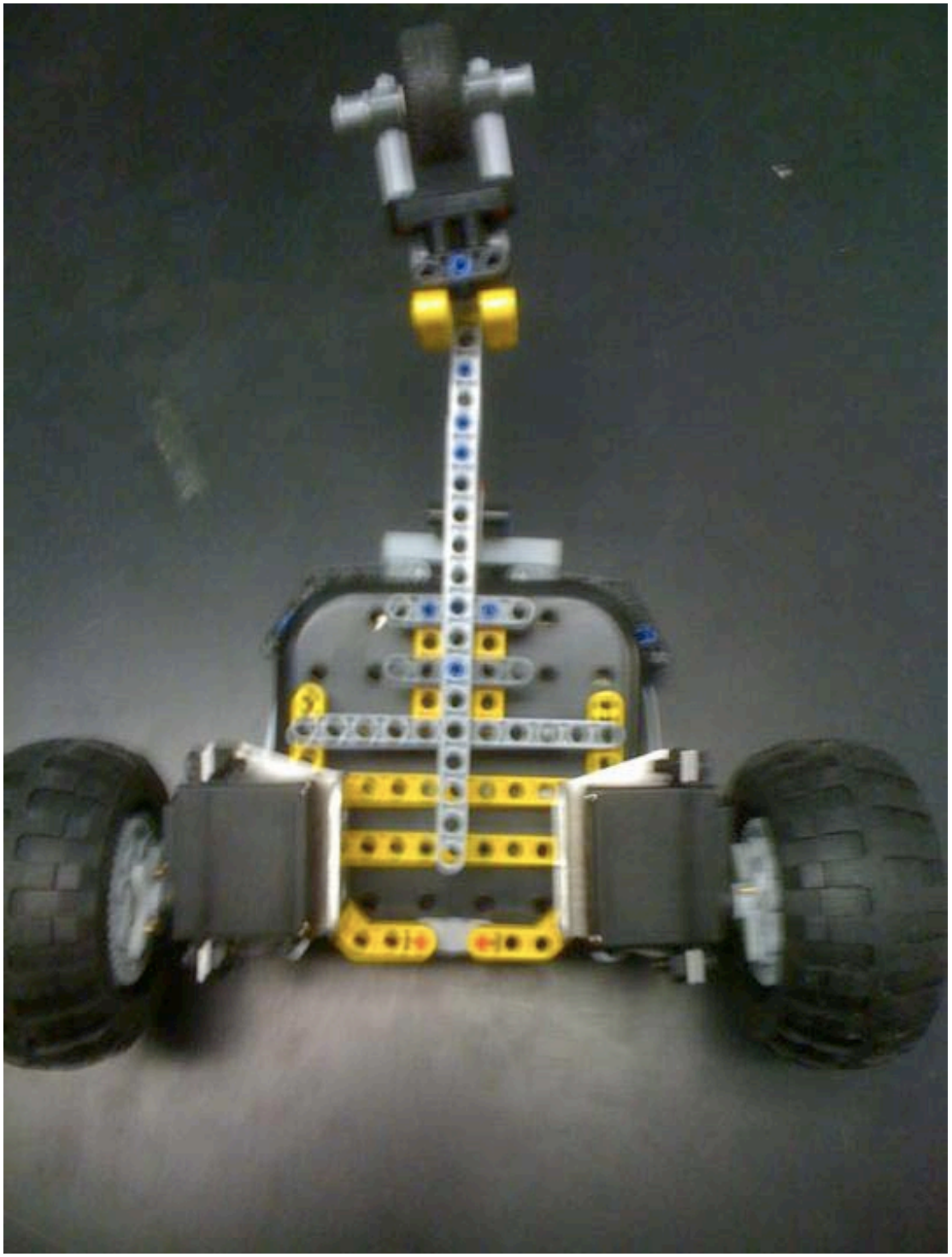


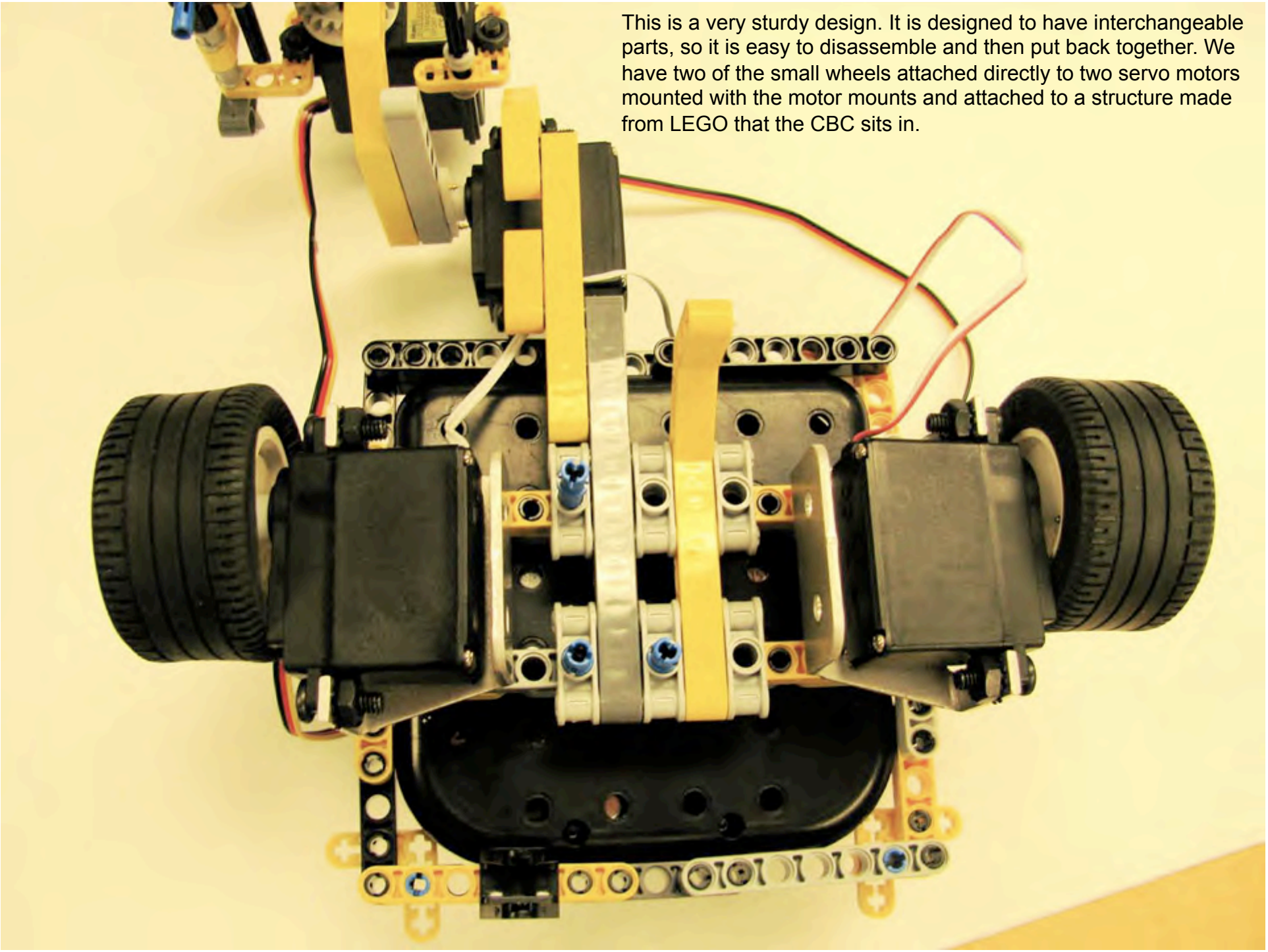




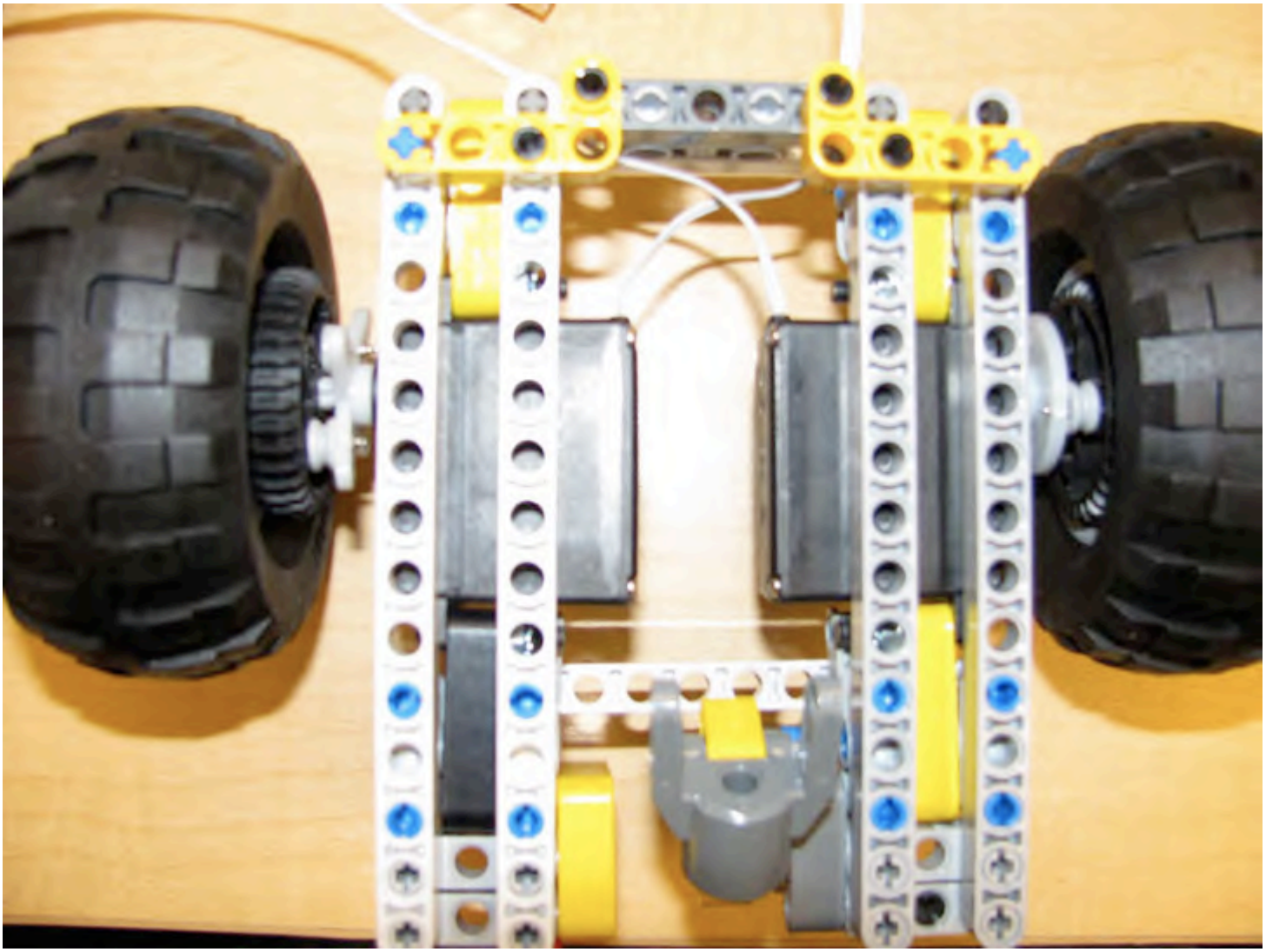

8 4:20PM

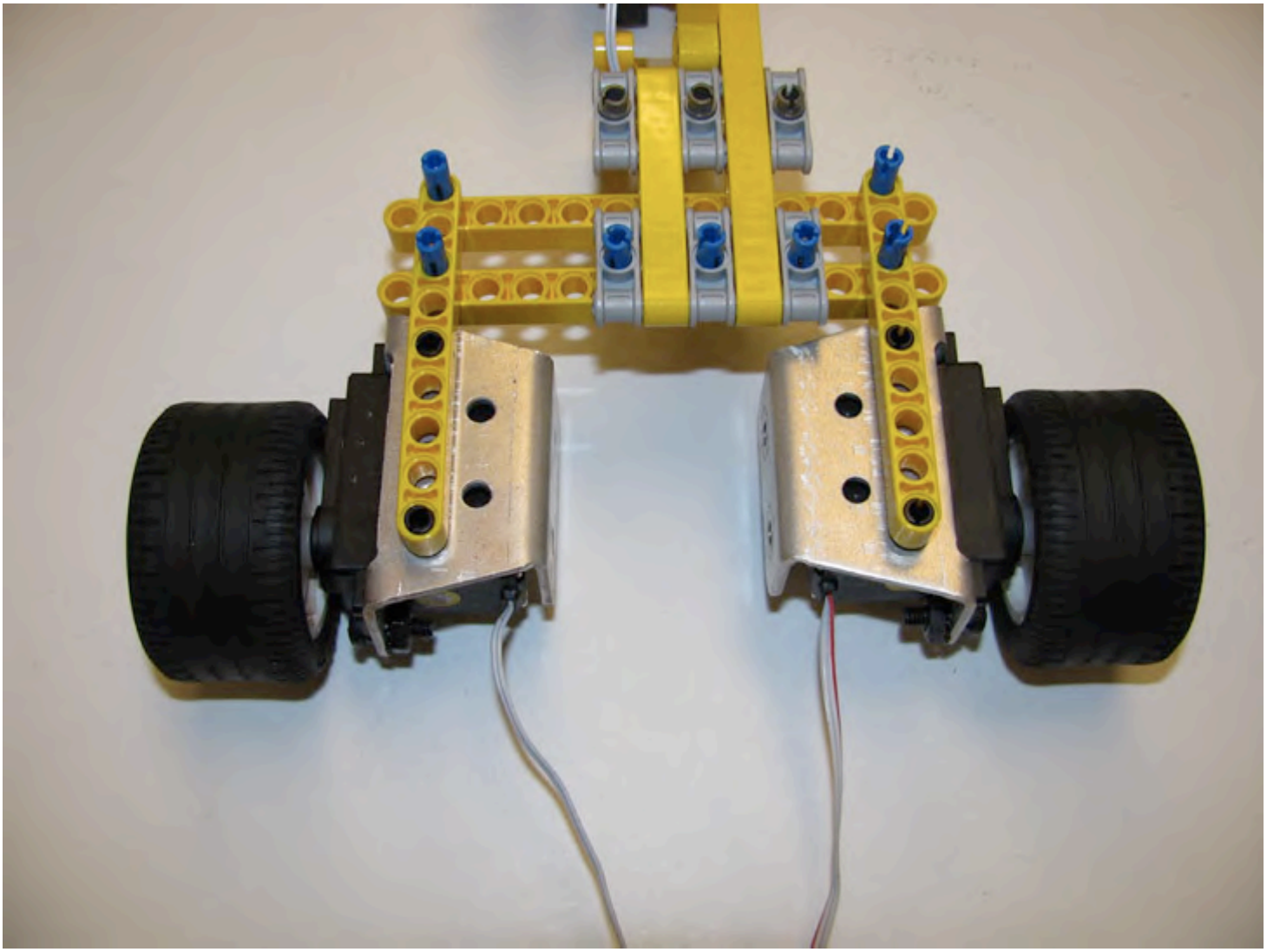


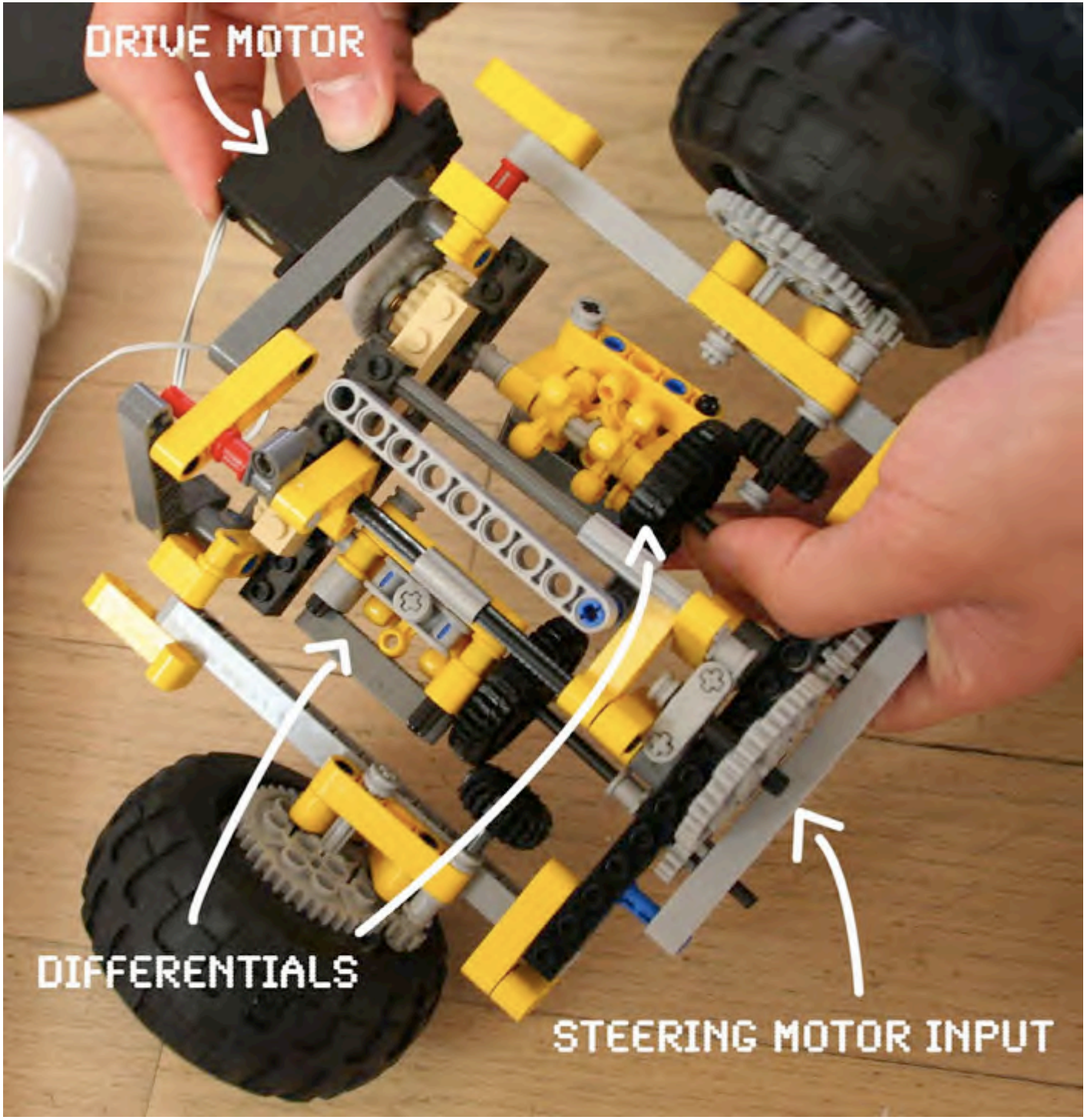




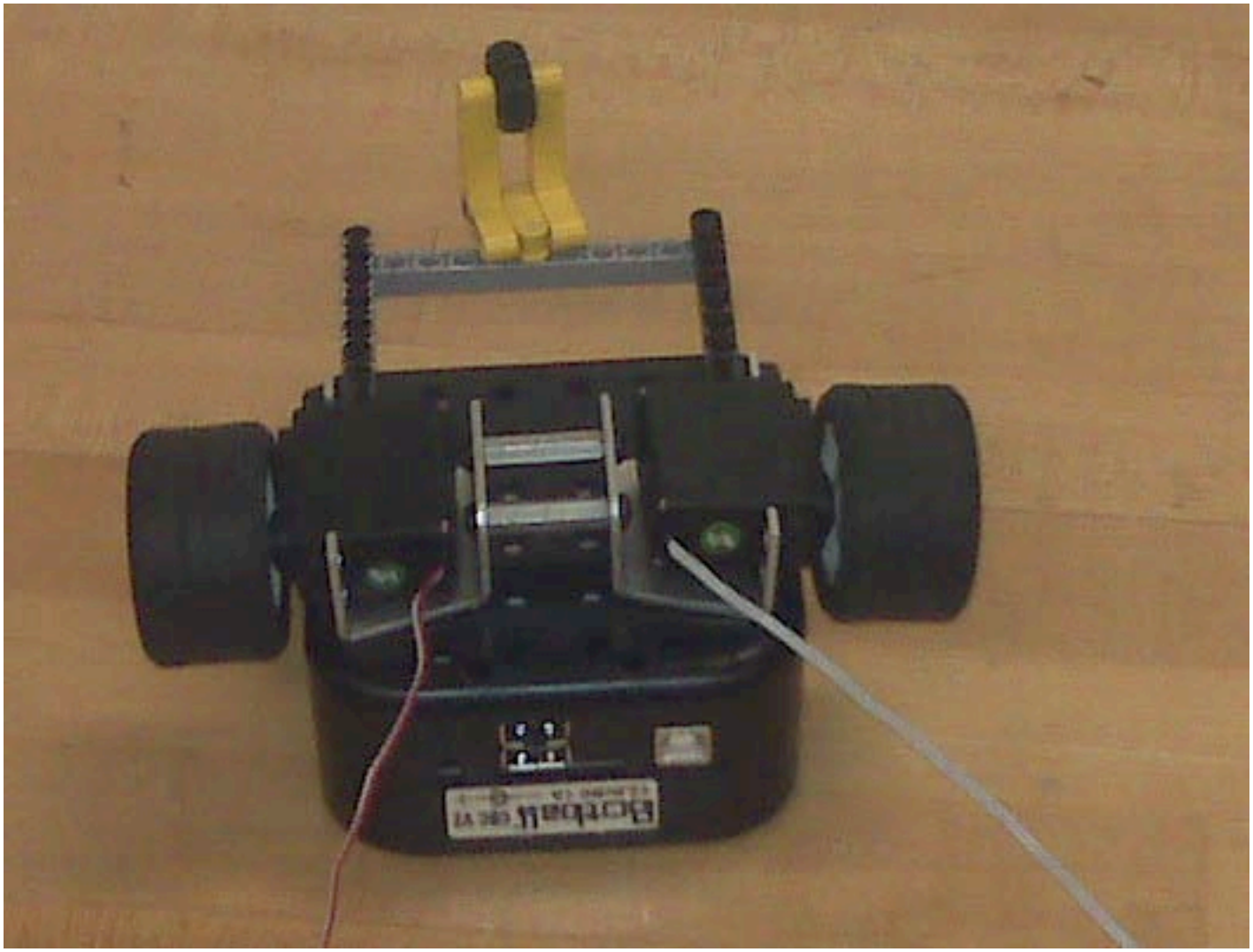
This is a very sturdy design. It is designed to have interchangeable parts, so it is easy to disassemble and then put back together. We have two of the small wheels attached directly to two servo motors mounted with the motor mounts and attached to a structure made from LEGO that the CBC sits in.



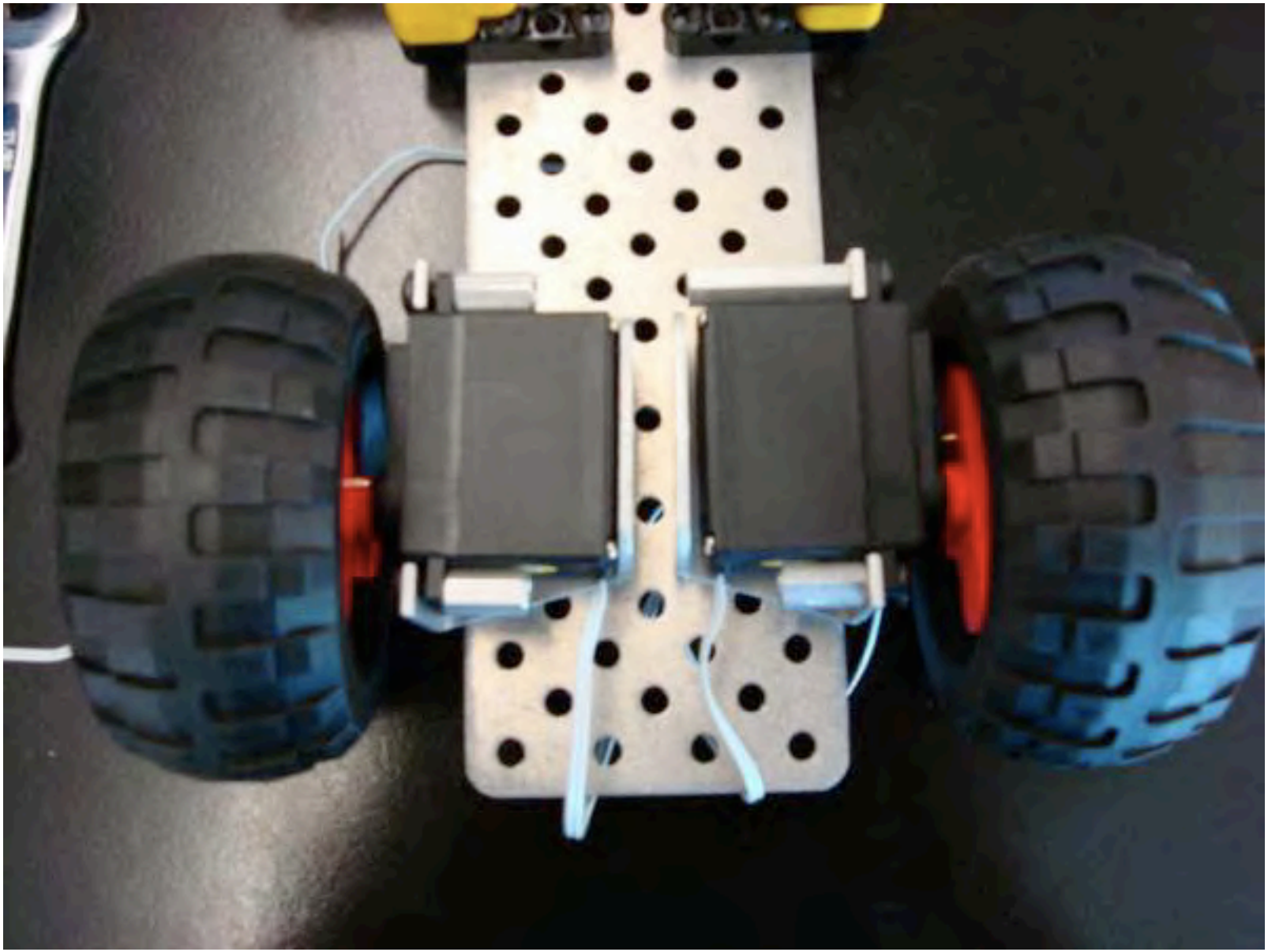




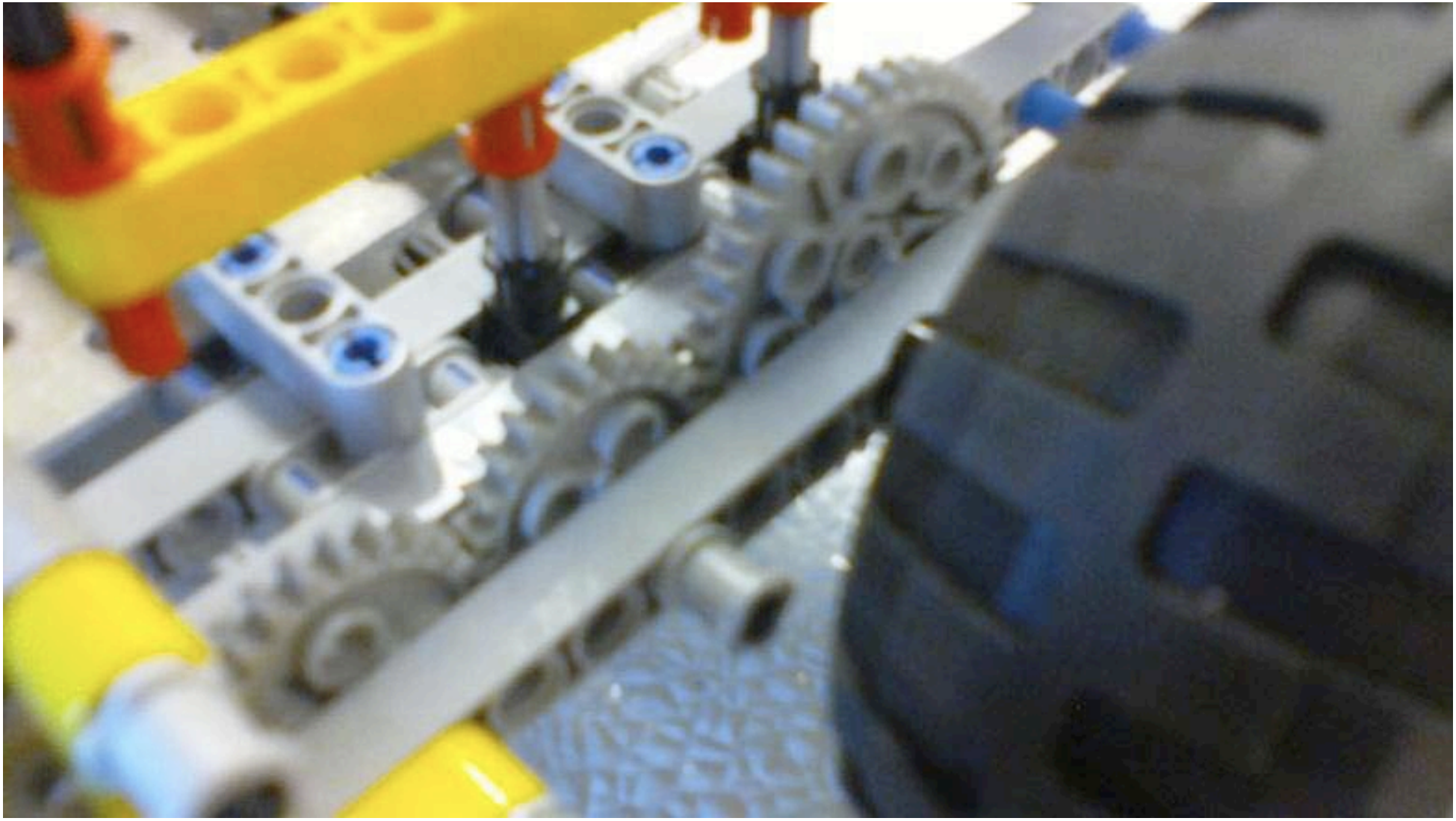
A dual differential drive is a complicated gear system that allows a robot to move in a straight line accurately and rotate along its axis without creating large amounts of error. The dual differential drive works by featuring one motor for steering and one motor for drive both connected to a series of two differentials. The differentials allow both motors to route power to the wheels while using the same gear system.

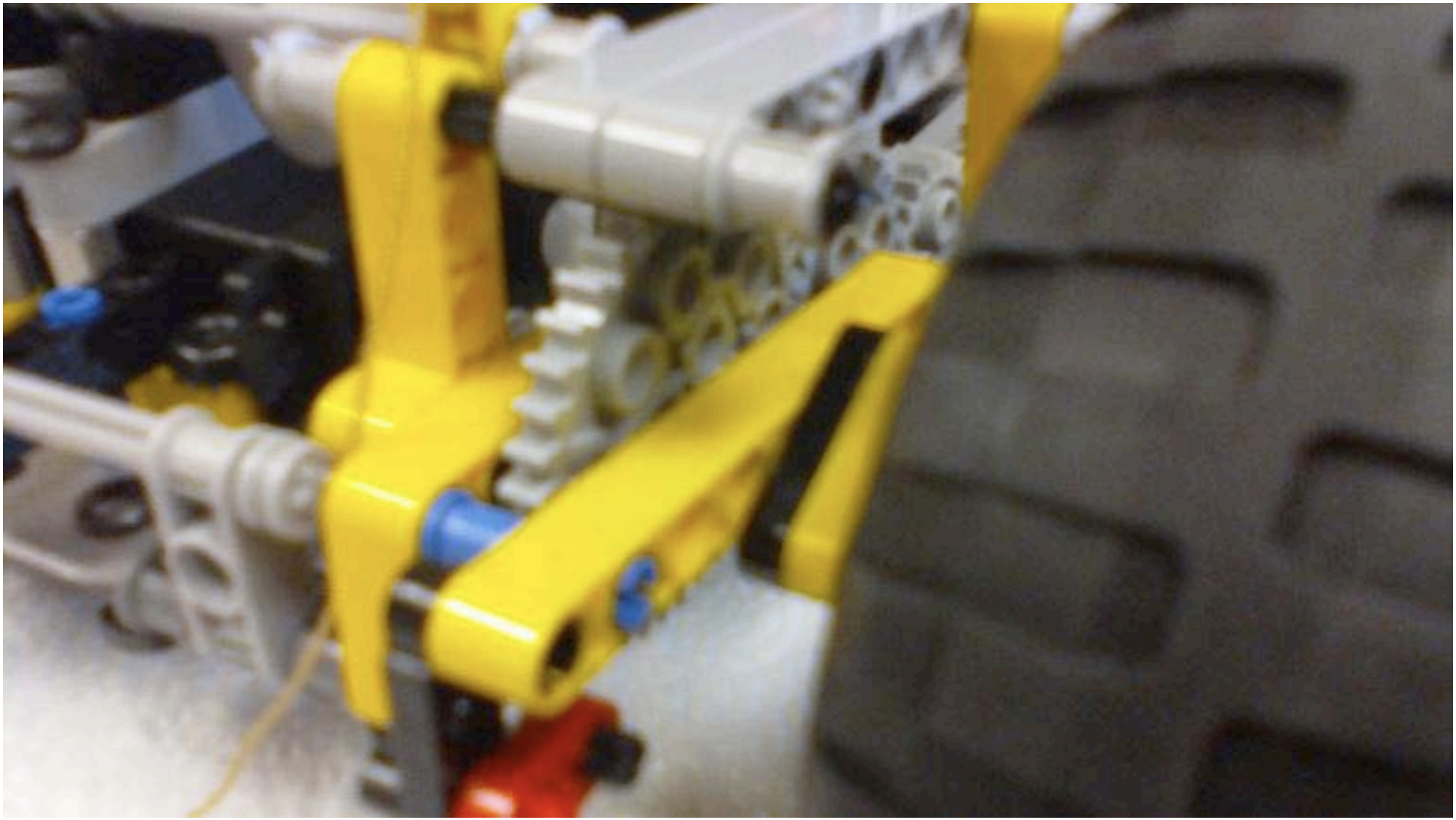


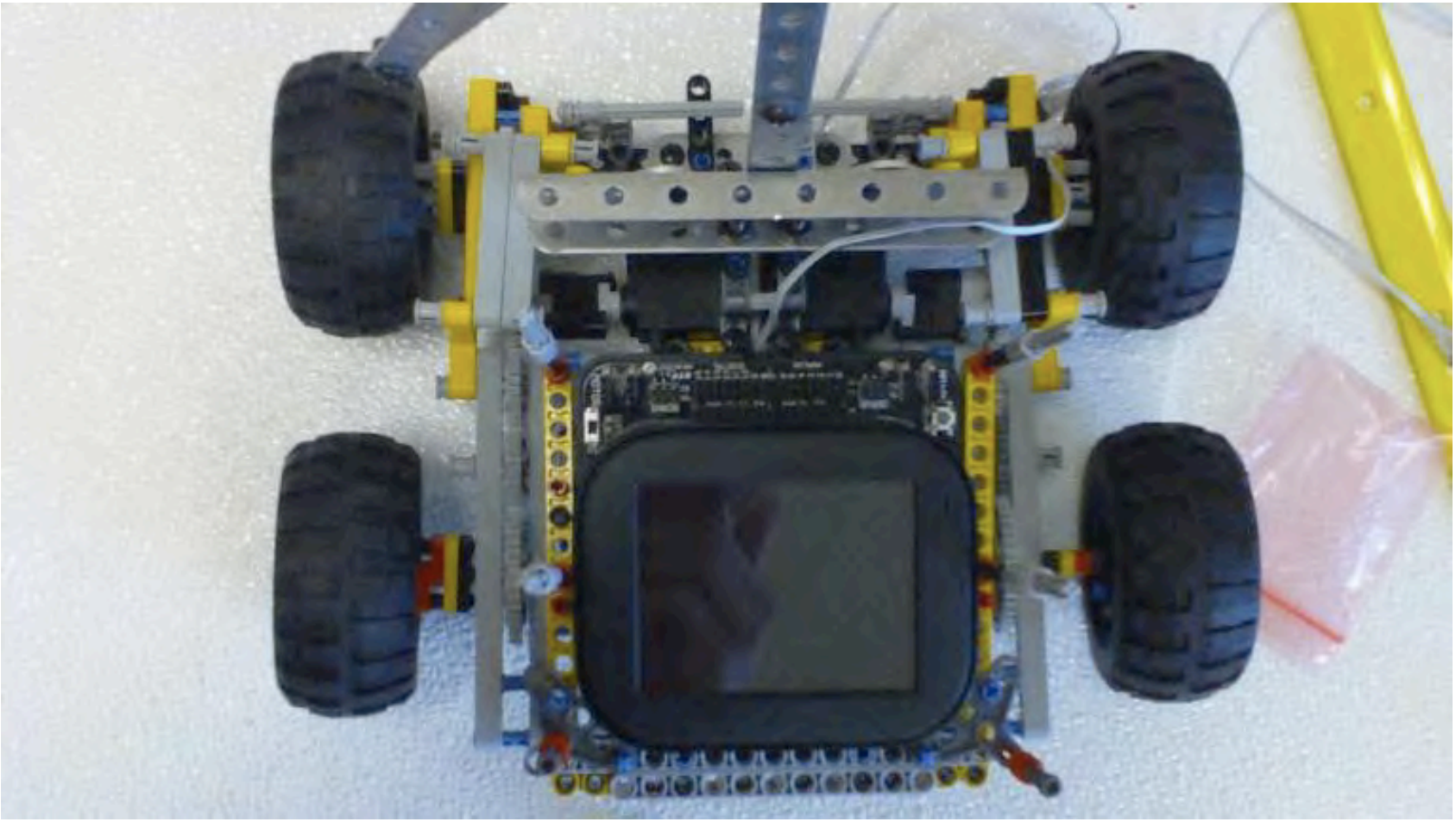
A simple three-wheeled design. Two wheels are powered and the third is for balance. A differential drive provides individual control to each wheel, so the robot can both go straight and turn in place. One motor powers each of the rear wheels separately. The robot is kept steady with a third wheel, called a castor, which increases robot balance and reduces the chance that it will tip over. The two drive wheels and the castor form a perfect semi-circle, so that when turning, the path of the castor will be equivalent to that of the drive wheels.



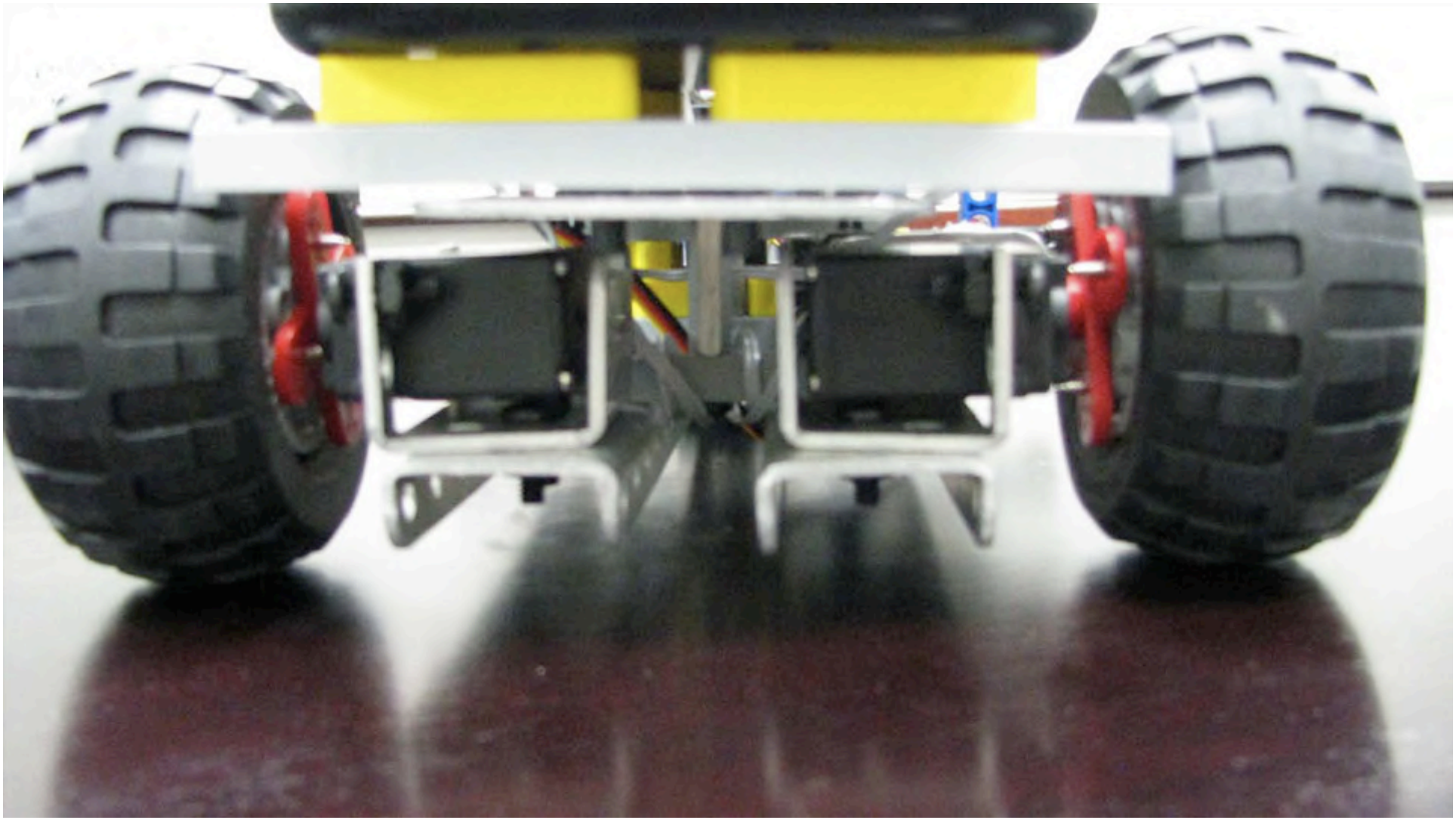
We are using the metal pieces to create a firm support for our robot while also allowing us to minimize the size of the chassis.



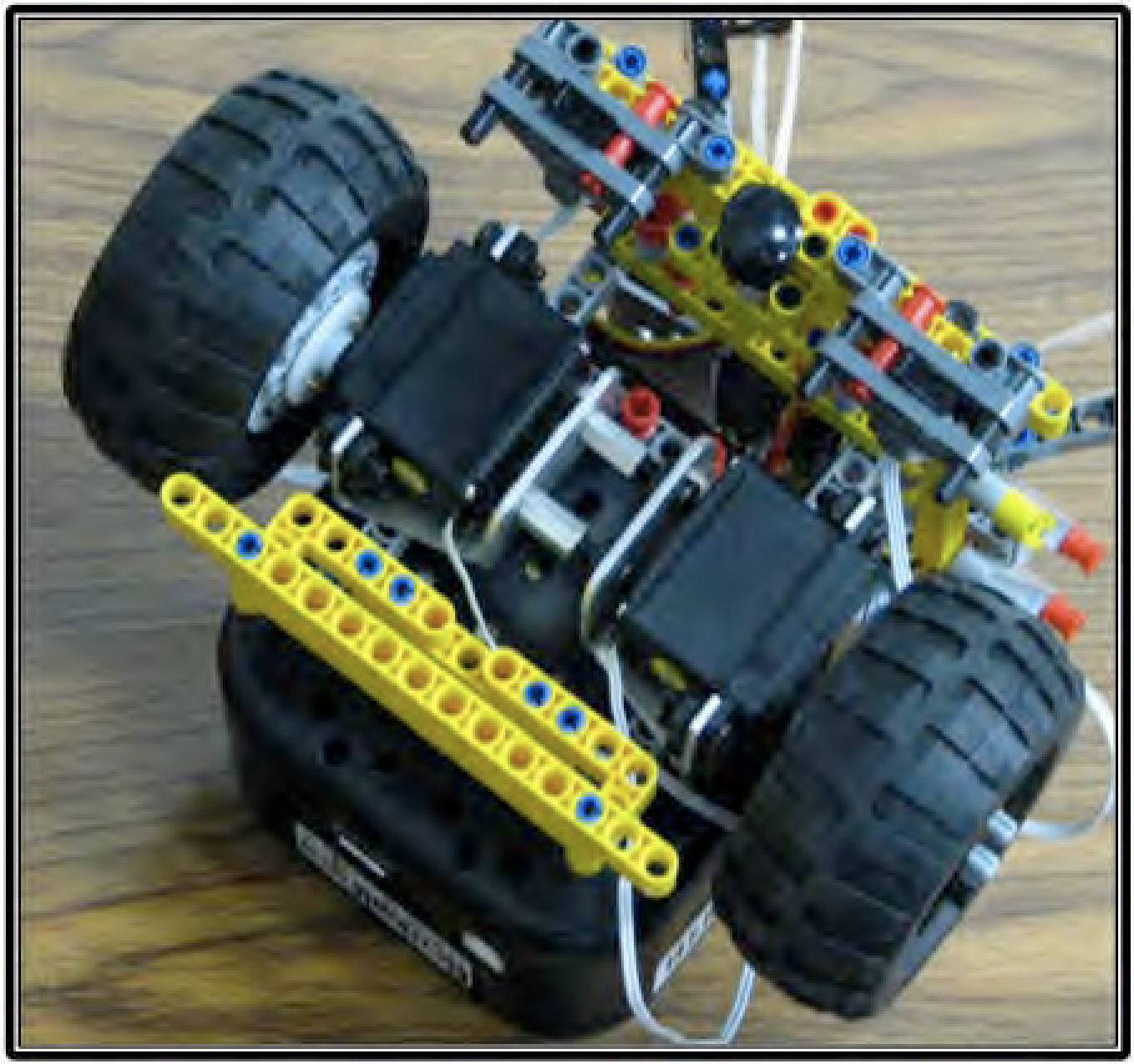




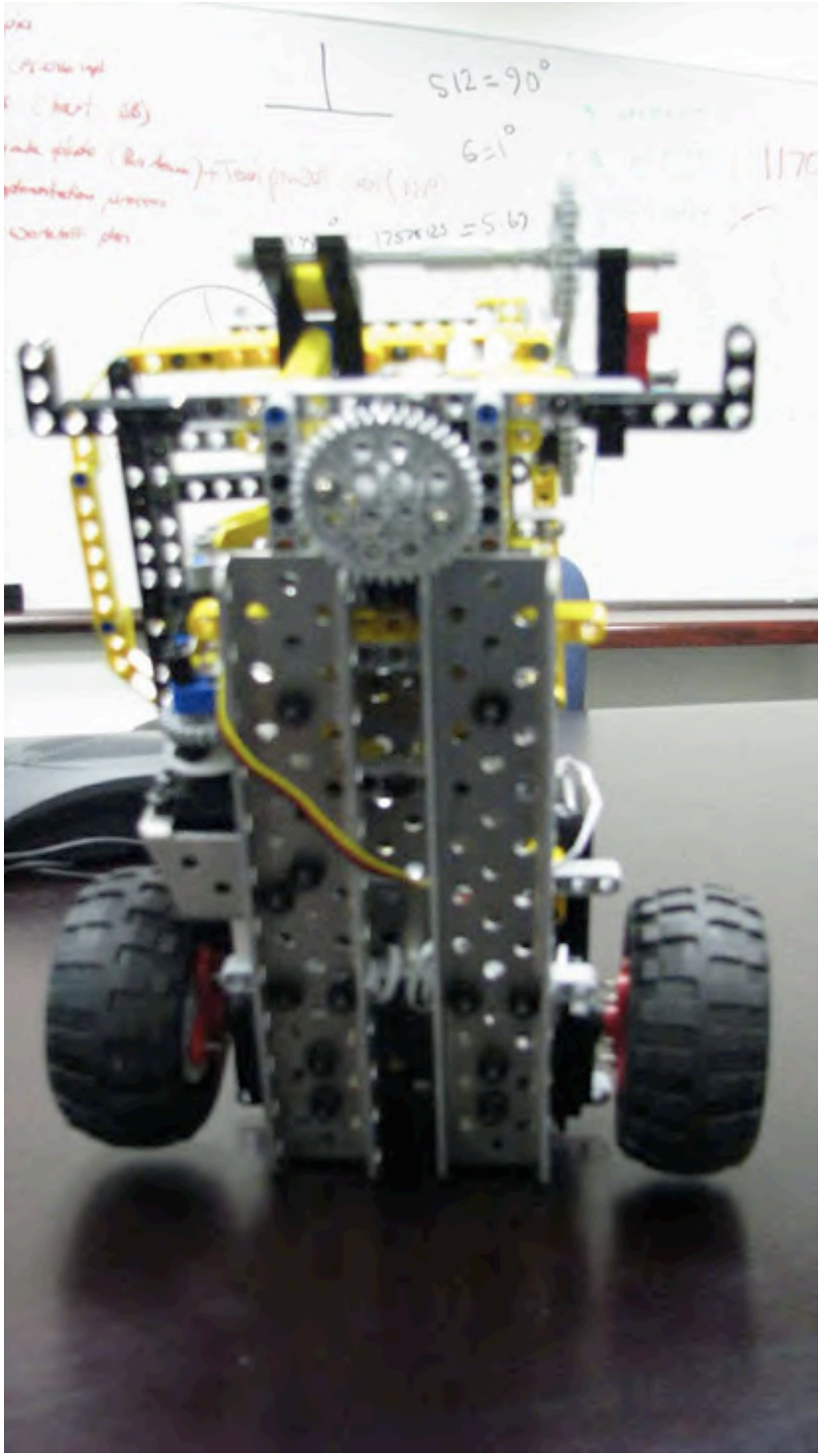
SUB 20
8½" X 11" 10M
XEROGRAPHIC DP - WHITE



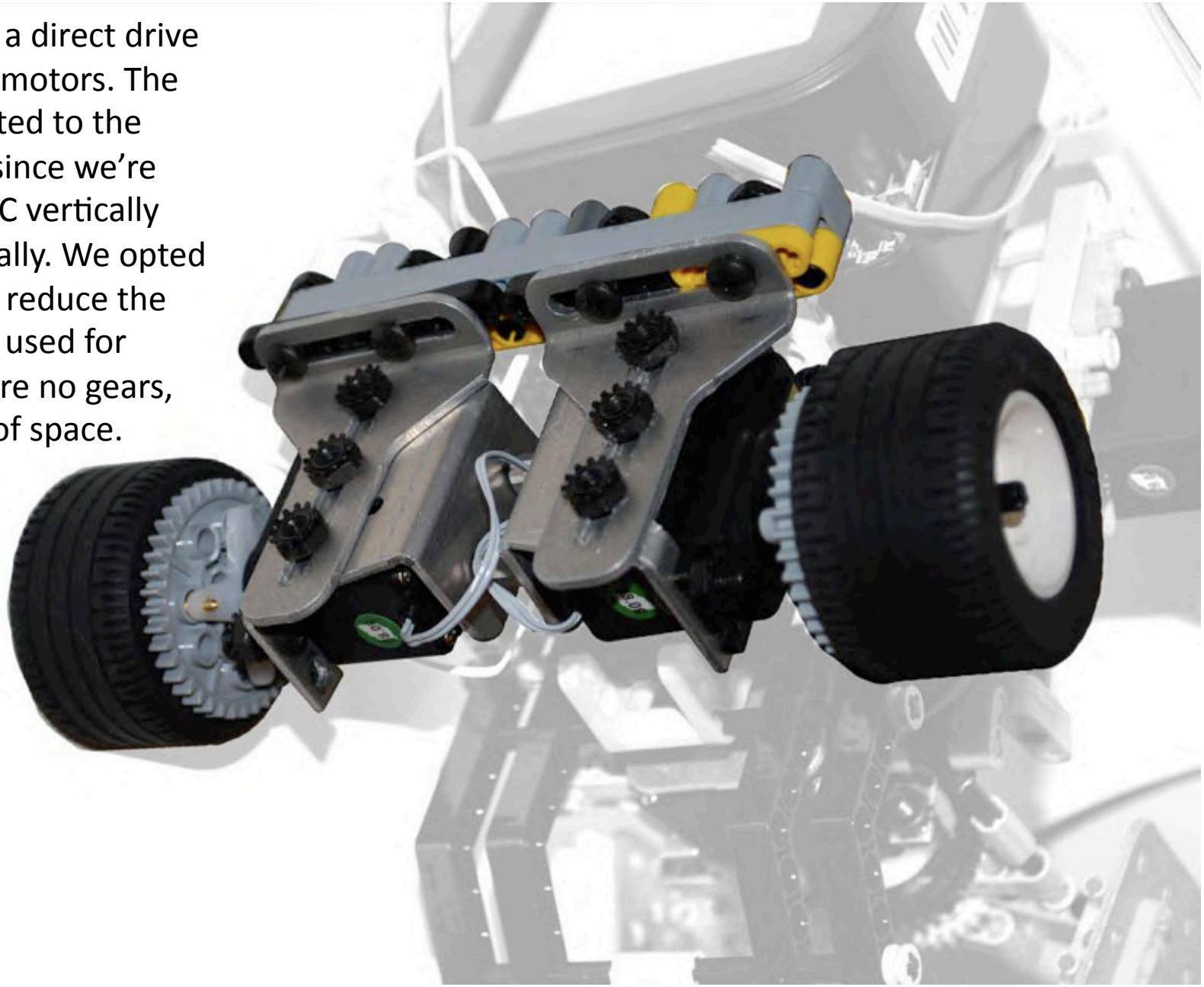
The robot’s drive train is comprised of two motors that turn two 64-tooth gears. These gears turn the wheels and tires that drive the robot. The motors are mounted with two servo brackets, which are mounted onto two metal channels on the bottom of the robot. The channels are screwed onto a metal plate further foward for the front of the robot via a standoff. The metal plate is fastened to the bottom of the CBC with LEGO pins and liftarms.

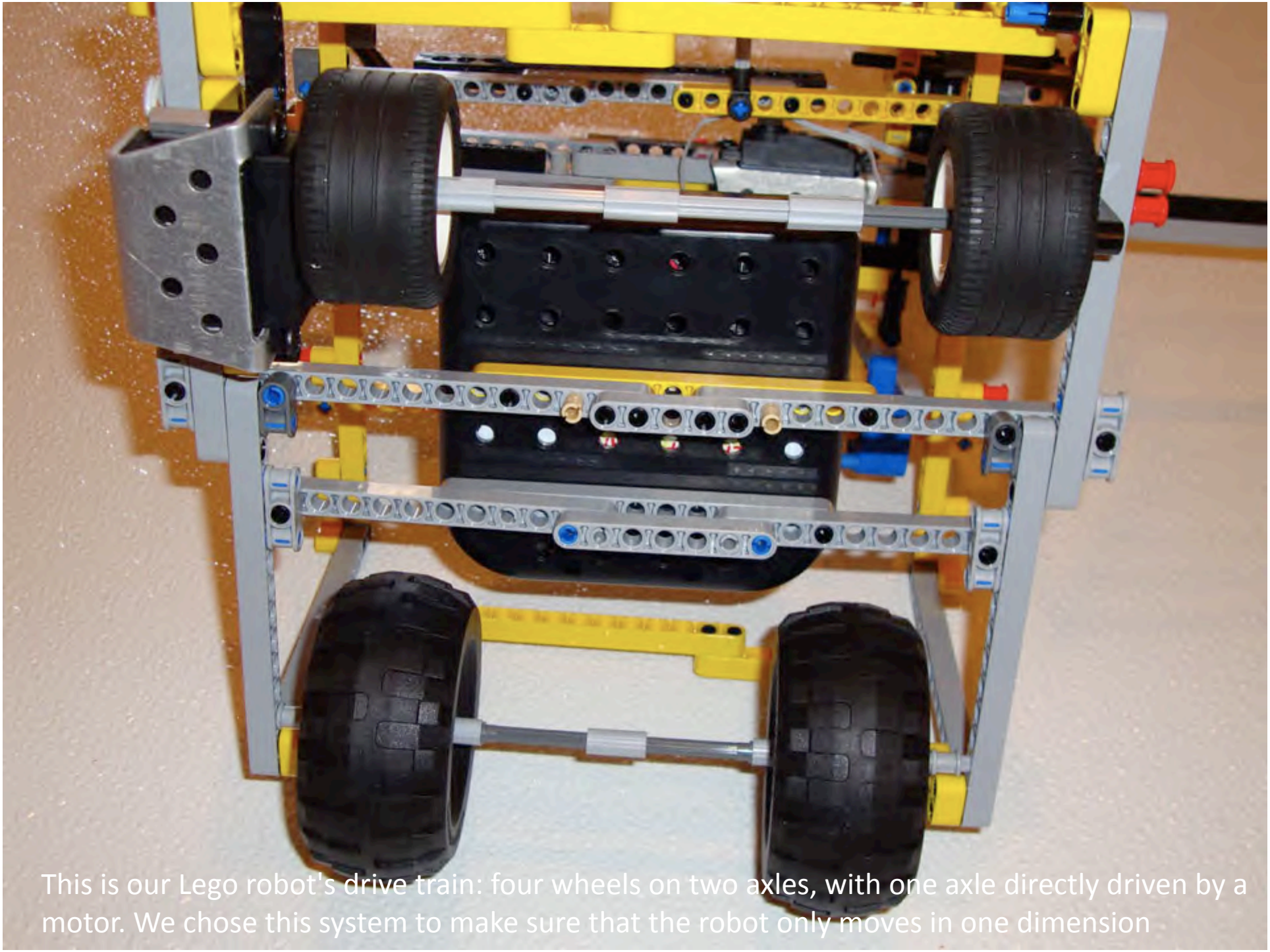


The mobility of our CBC robot depends on the stability of our drive train. We used servo brackets as a simple way to mount the motors onto the chassis.. For stability, we connected the two brackets together with two metal channels. This provided more rigidity to our drive train, controlling the vibrations of the wheels. To complete our drive train, we added a bump caster, which slides smoothly on the surface and over the FRP dividers.

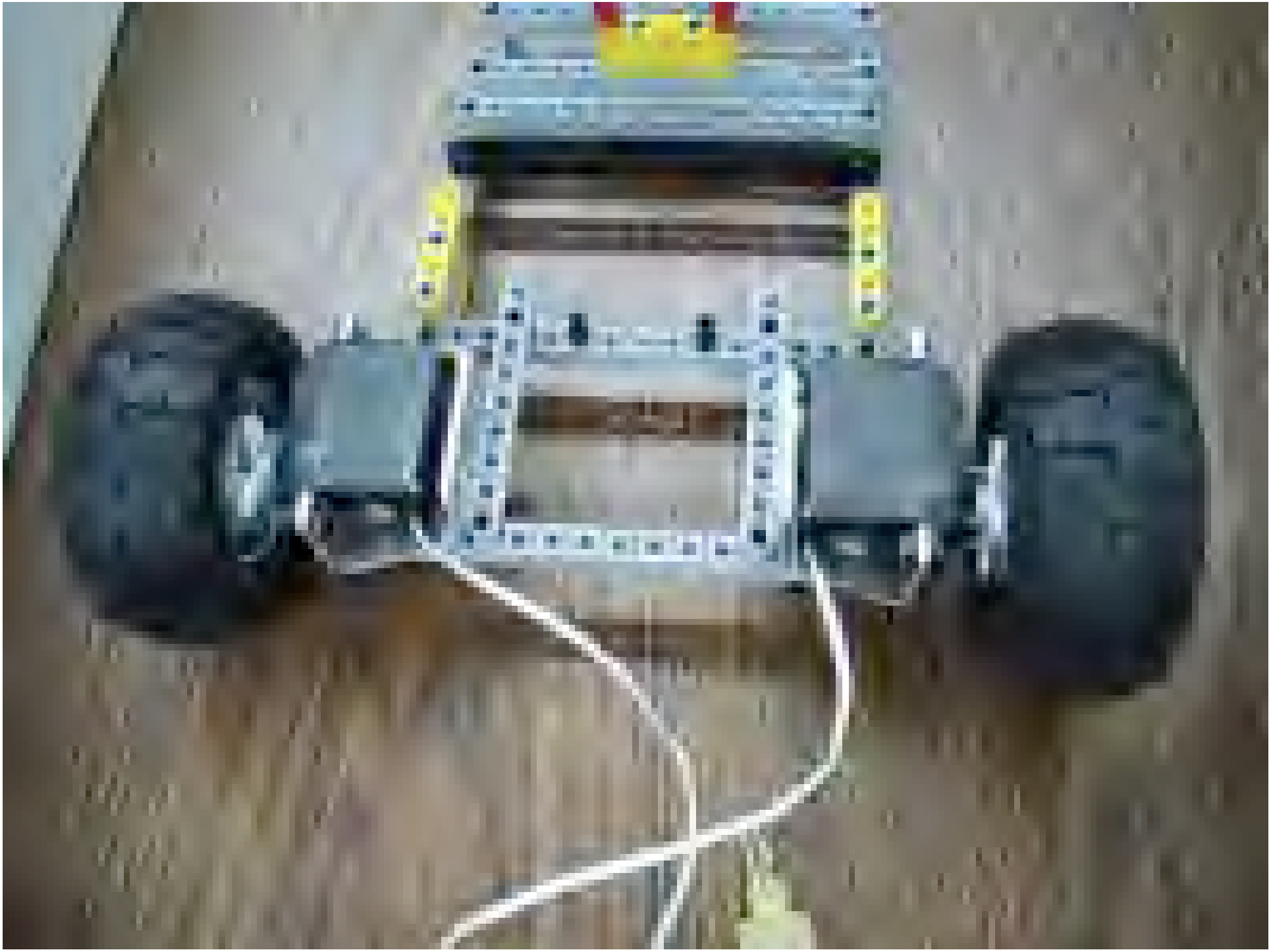

512=90°
6=1°

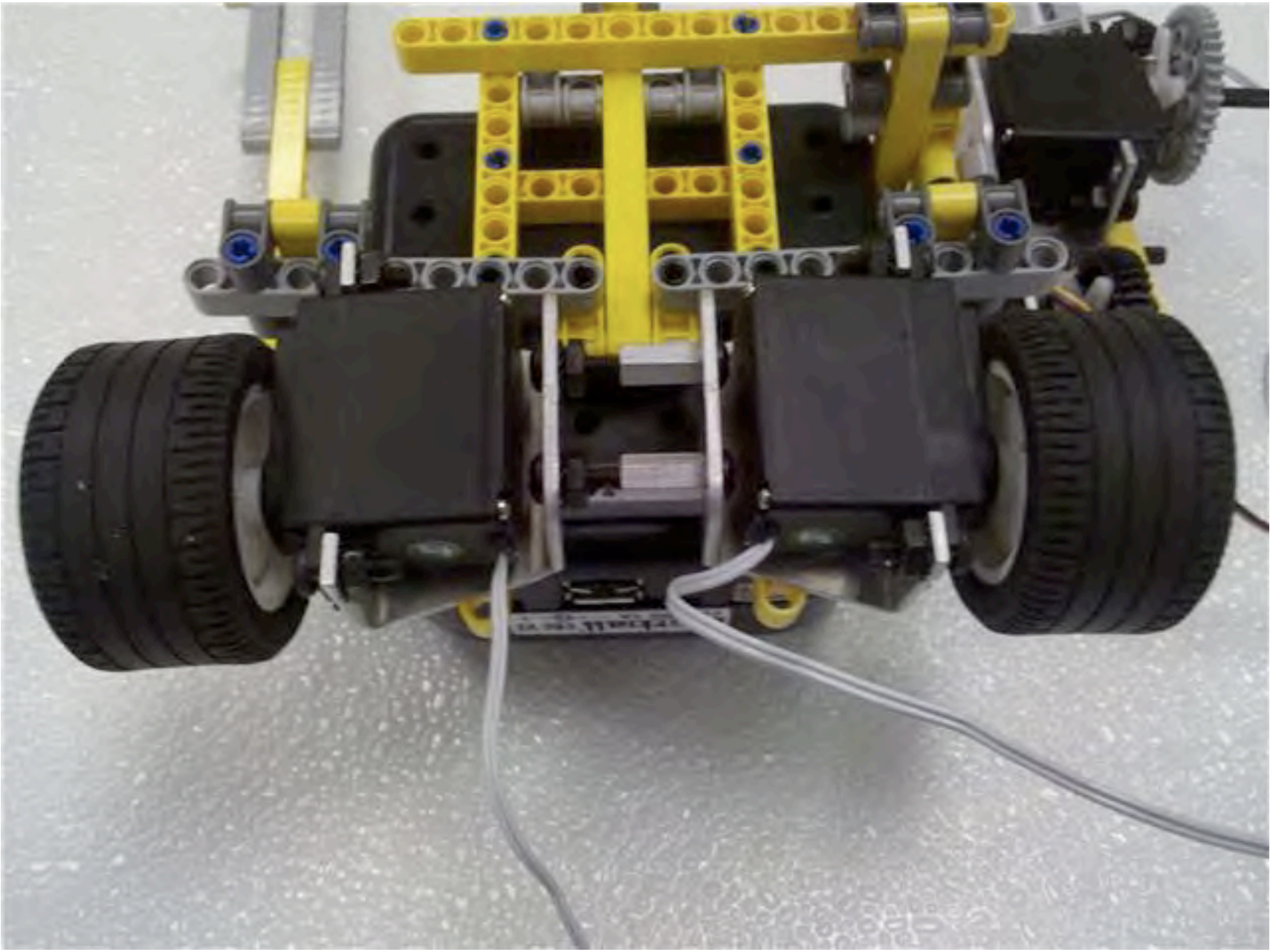
Our drive train is a direct drive system with two motors. The servos are mounted to the side of the CBC, since we're mounting the CBC vertically and not horizontally. We opted for this design to reduce the amount of space used for gearing – there are no gears, so we save a lot of space.

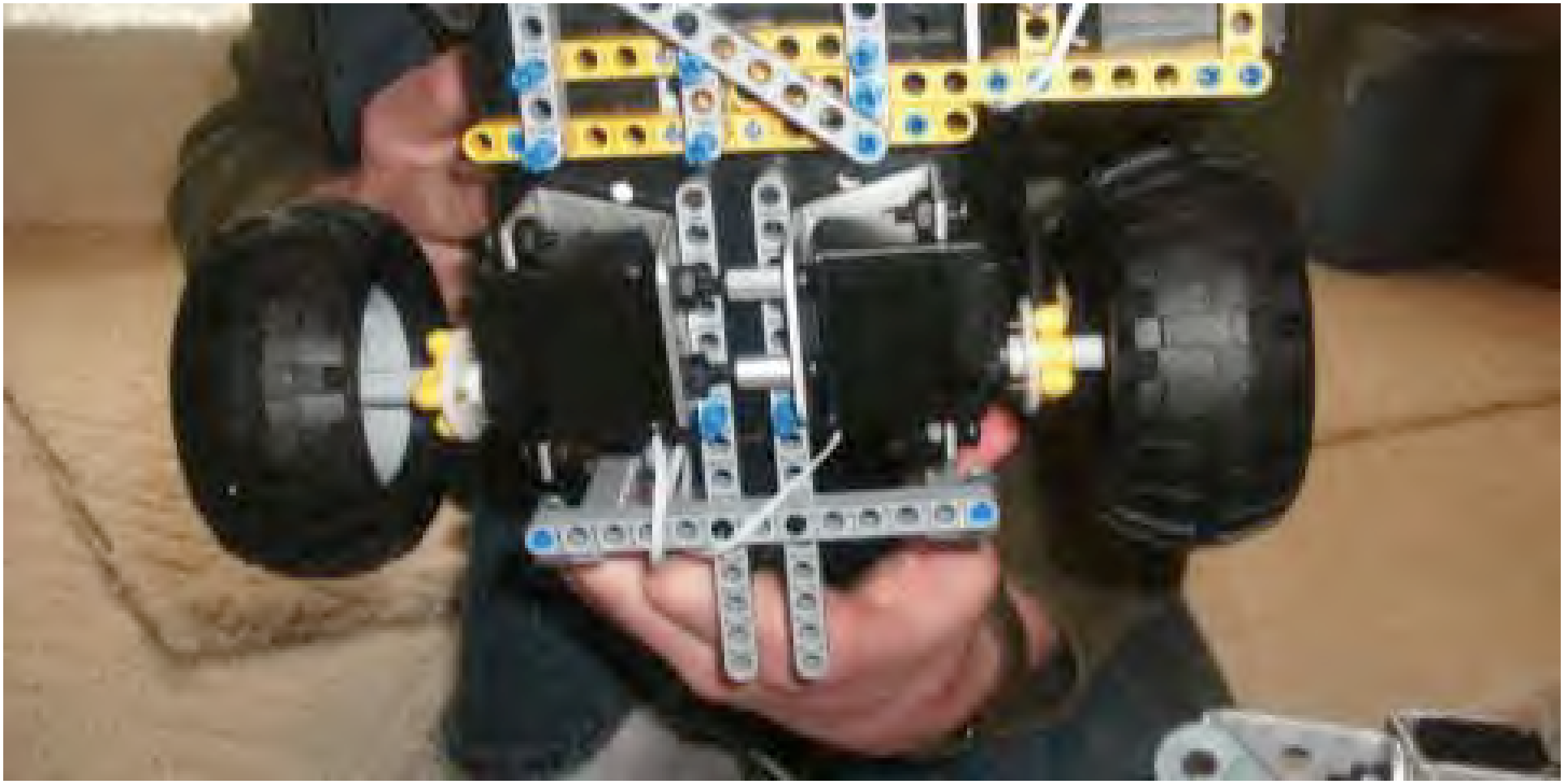




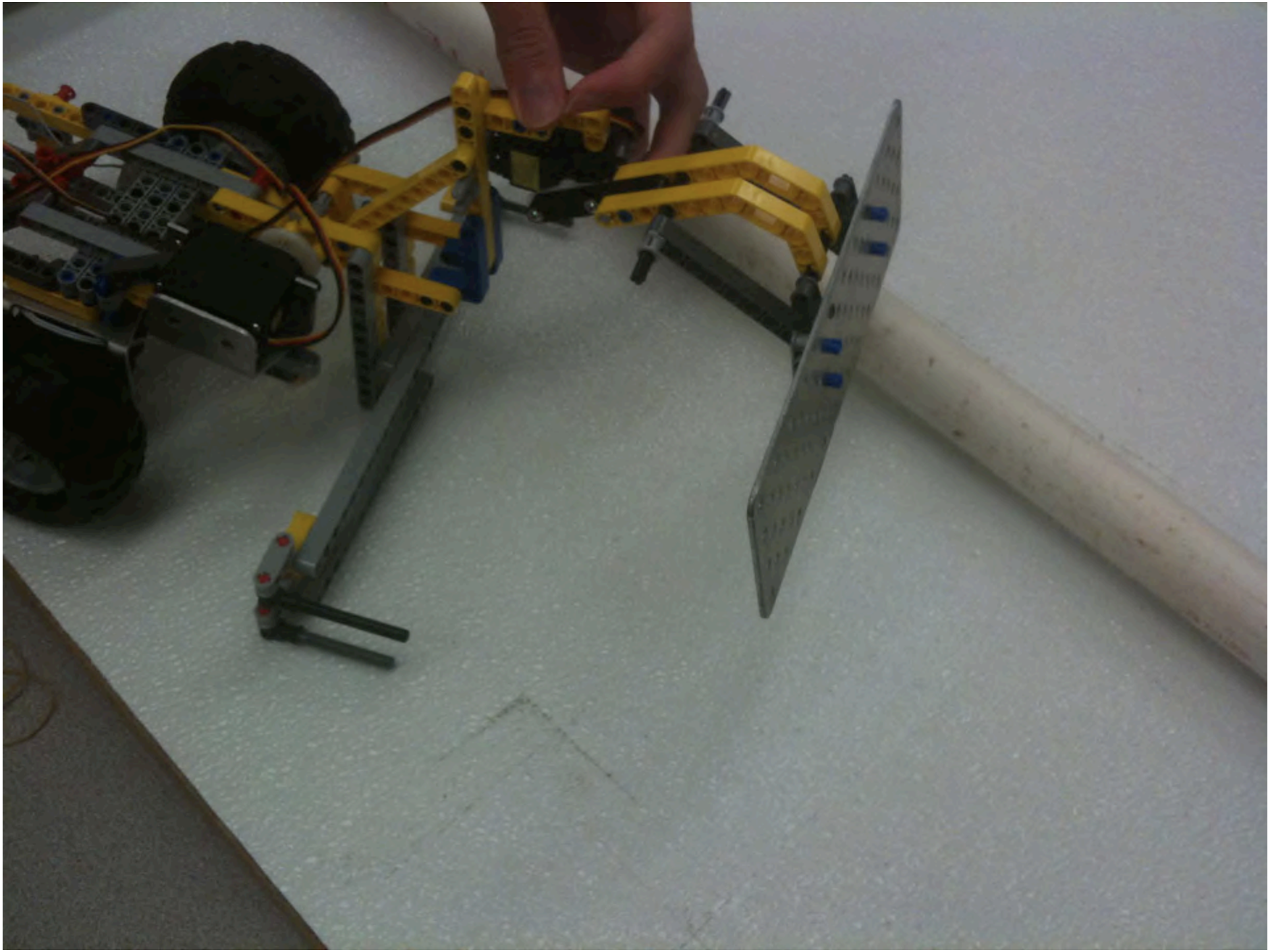
This is our Lego robot's drive train: four wheels on two axles, with one axle directly driven by a motor. We chose this system to make sure that the robot only moves in one dimension

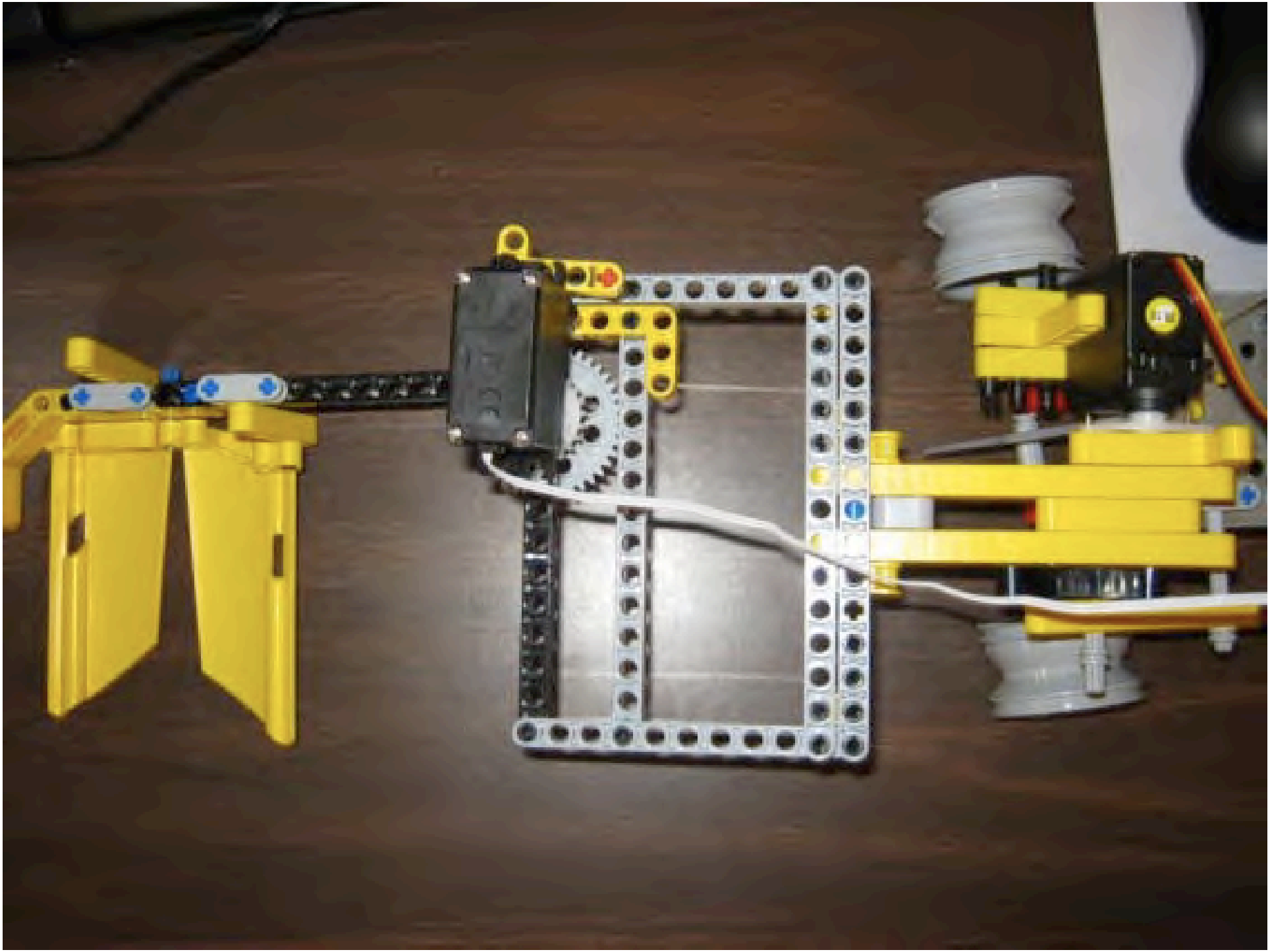


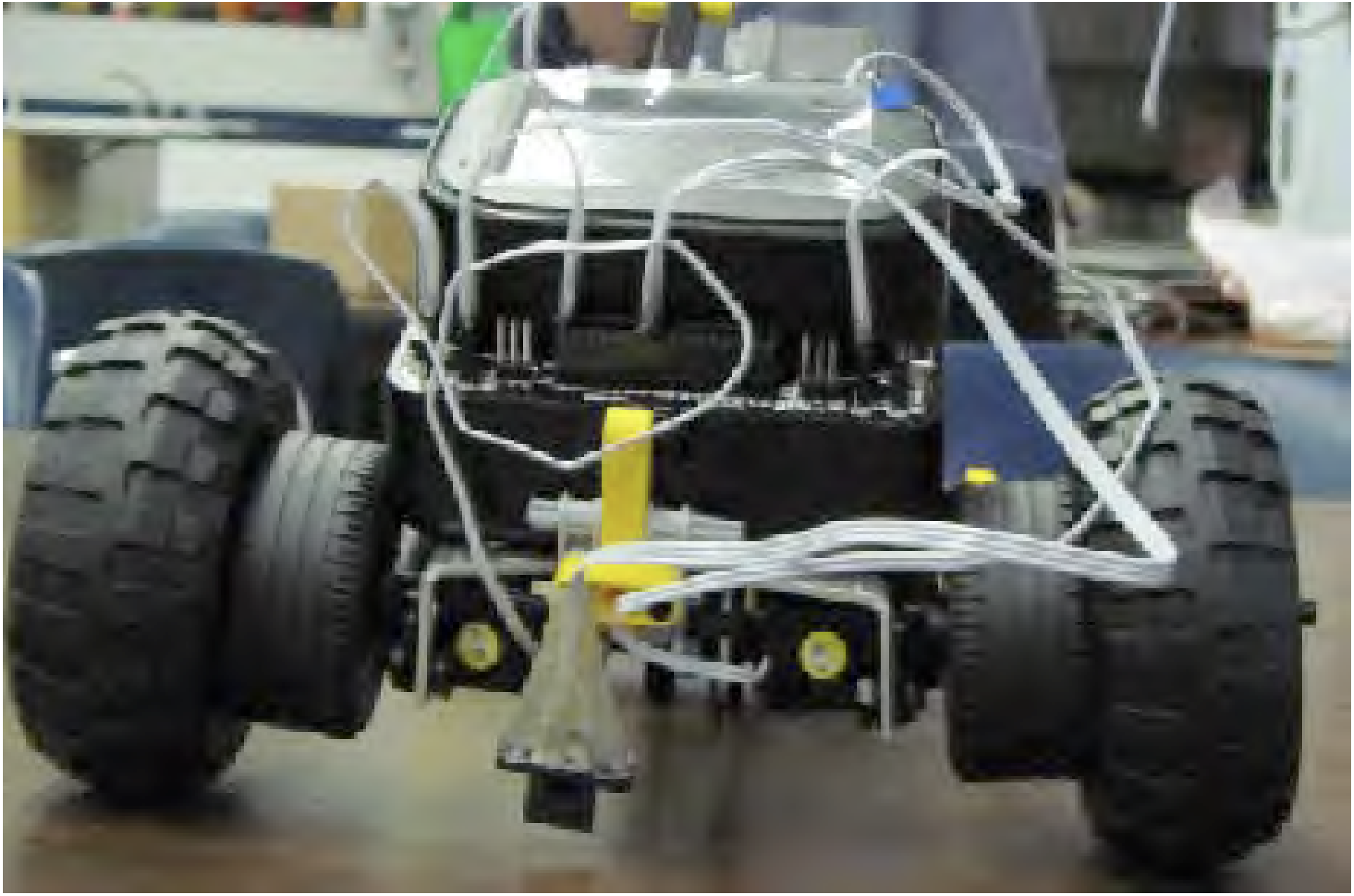


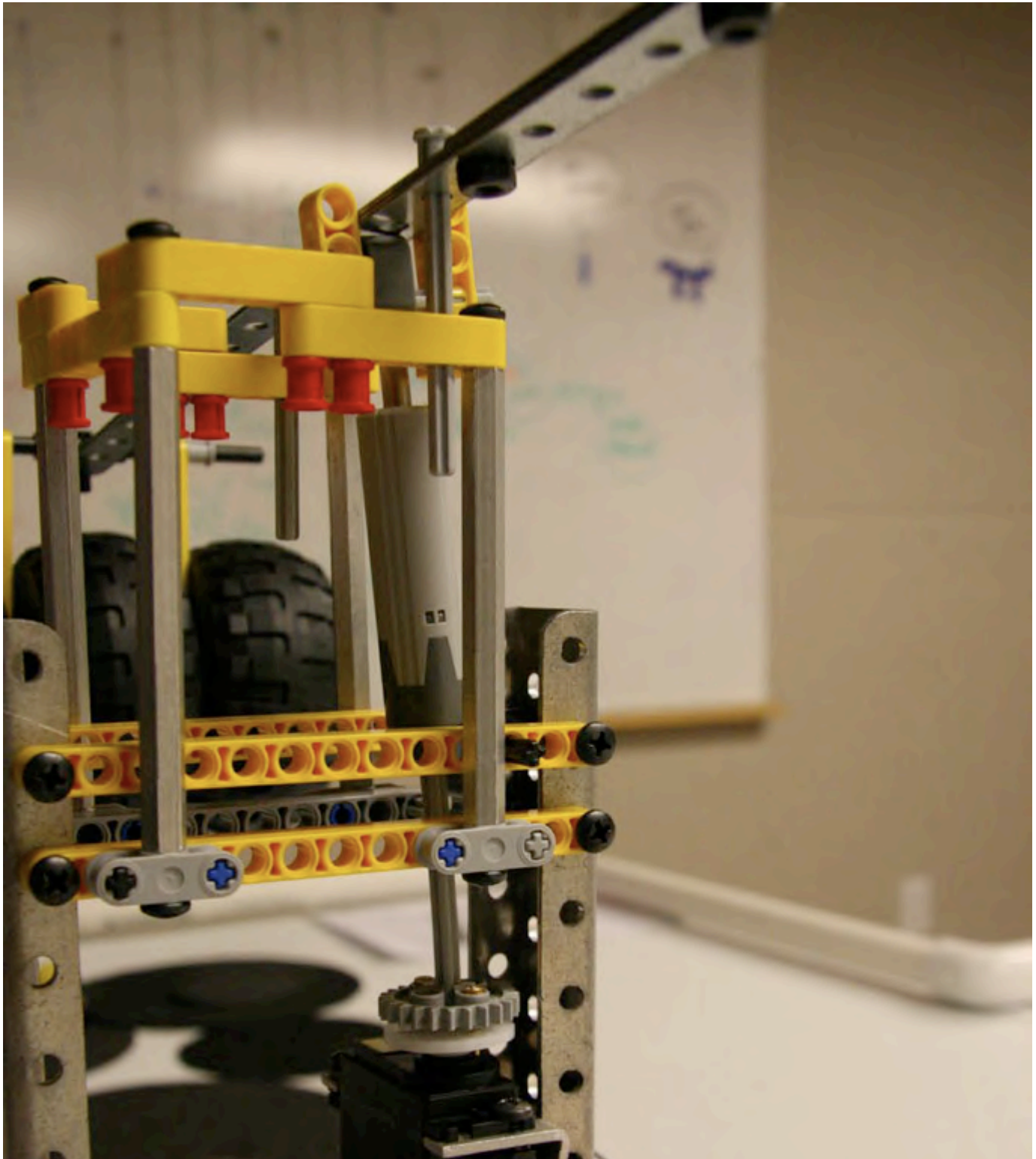


Effectors

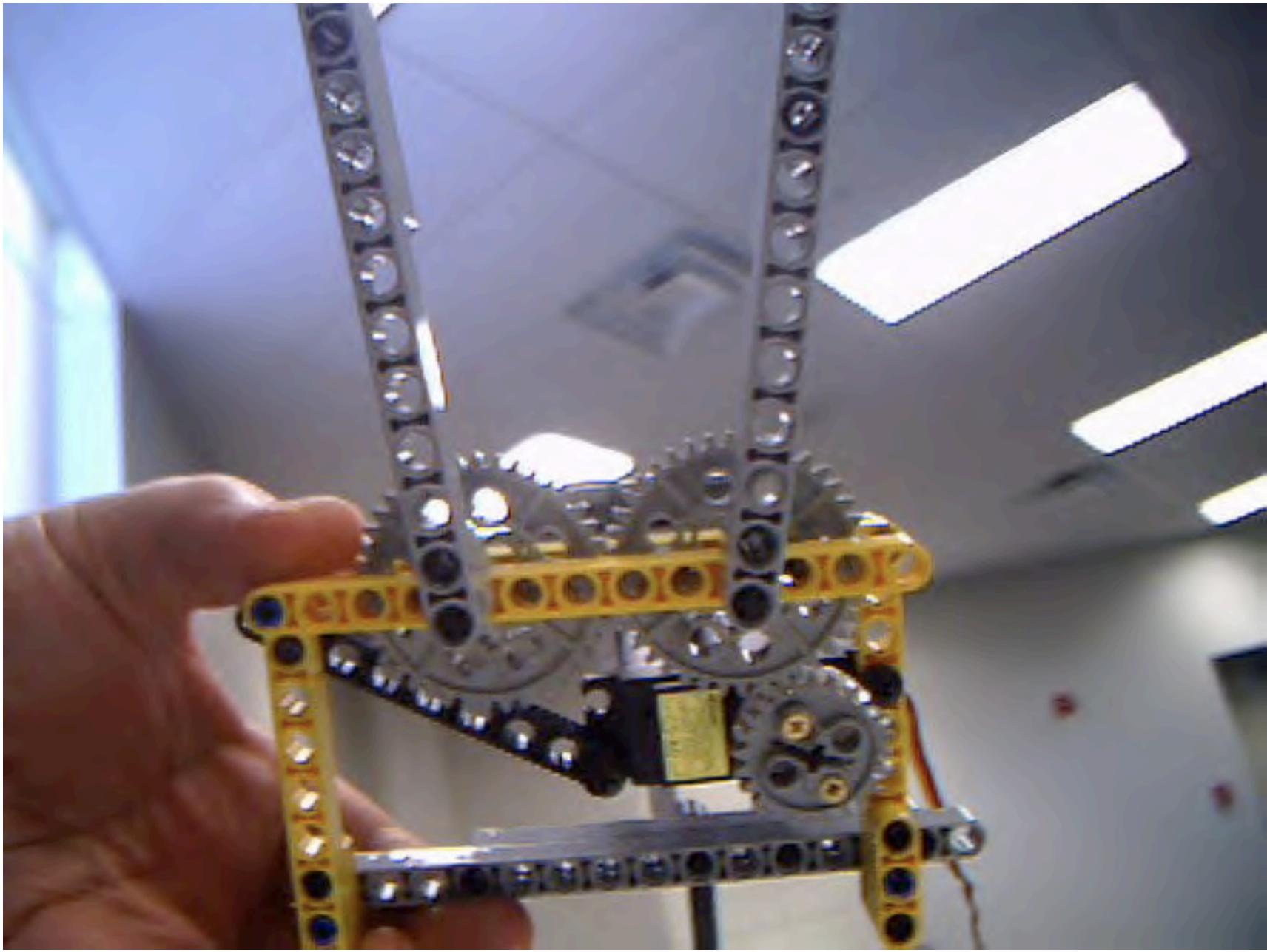


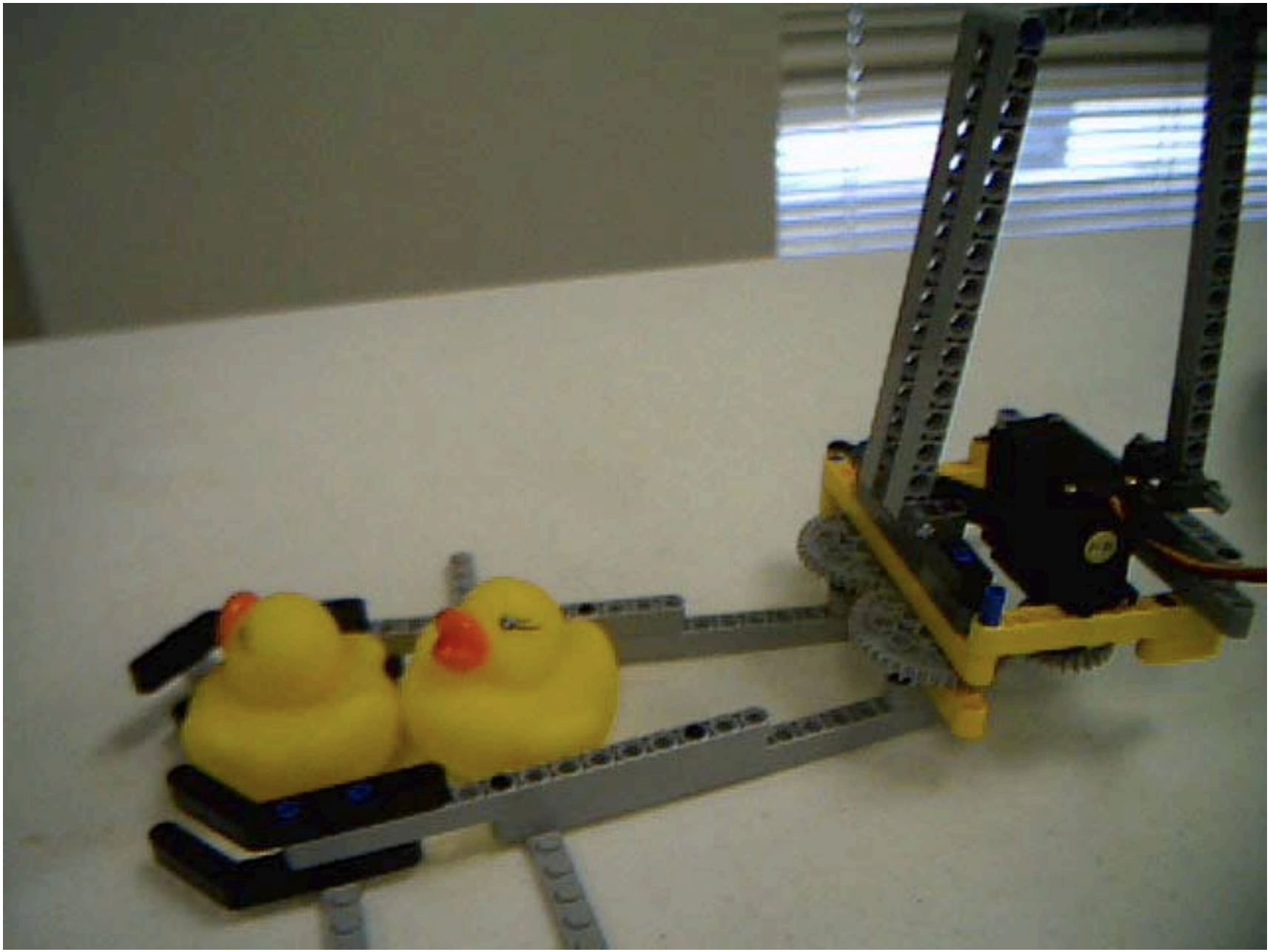


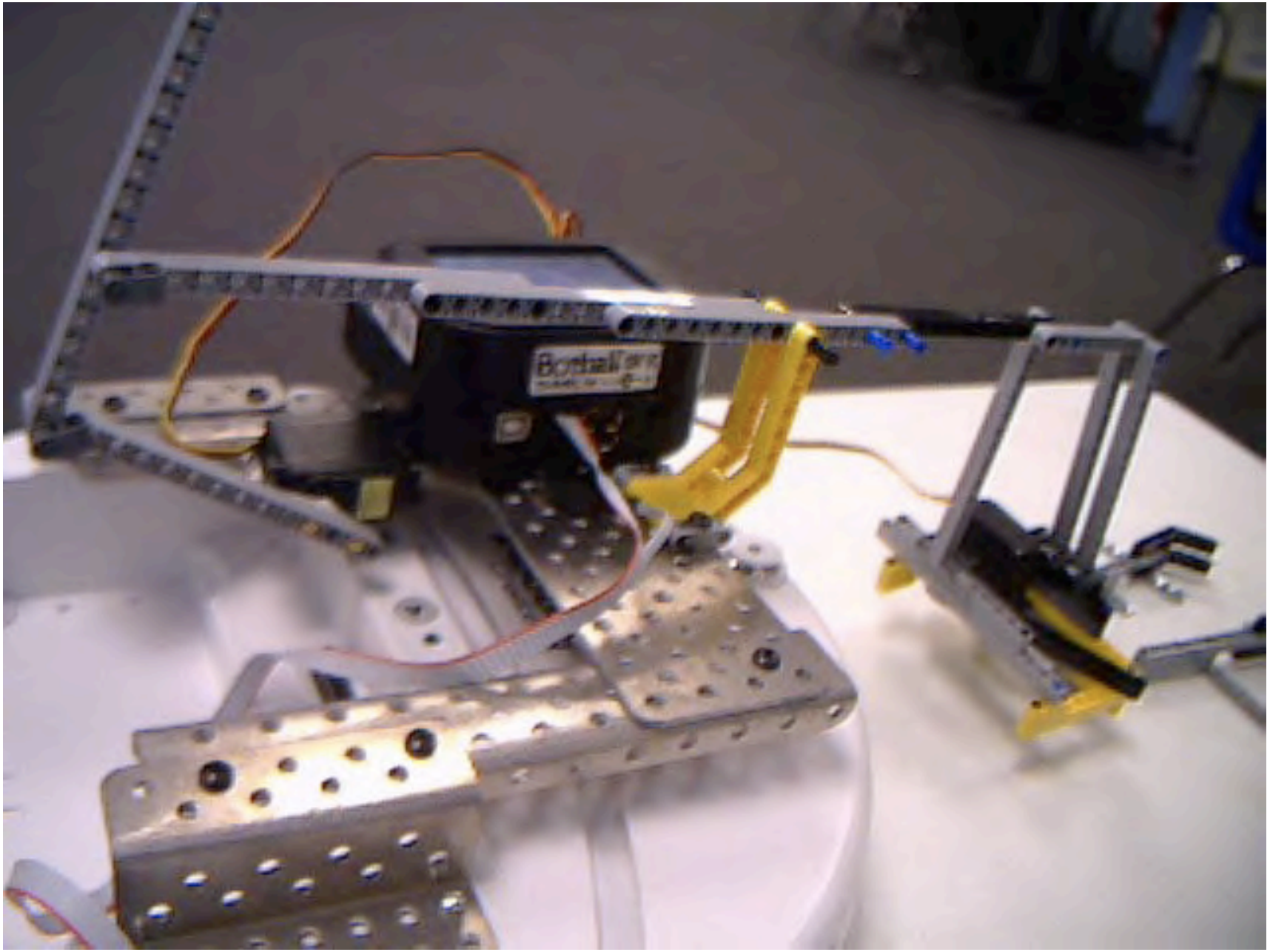


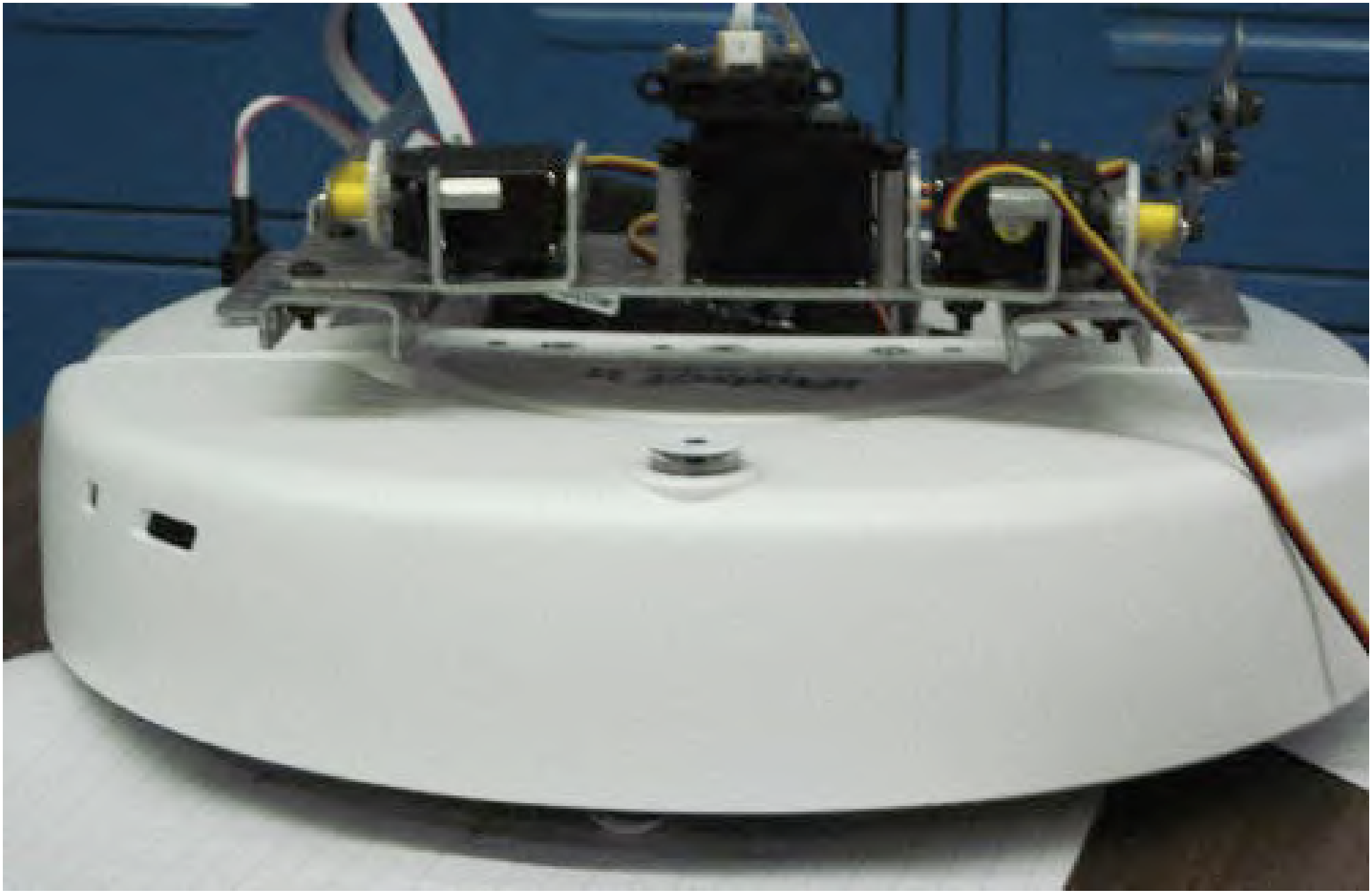


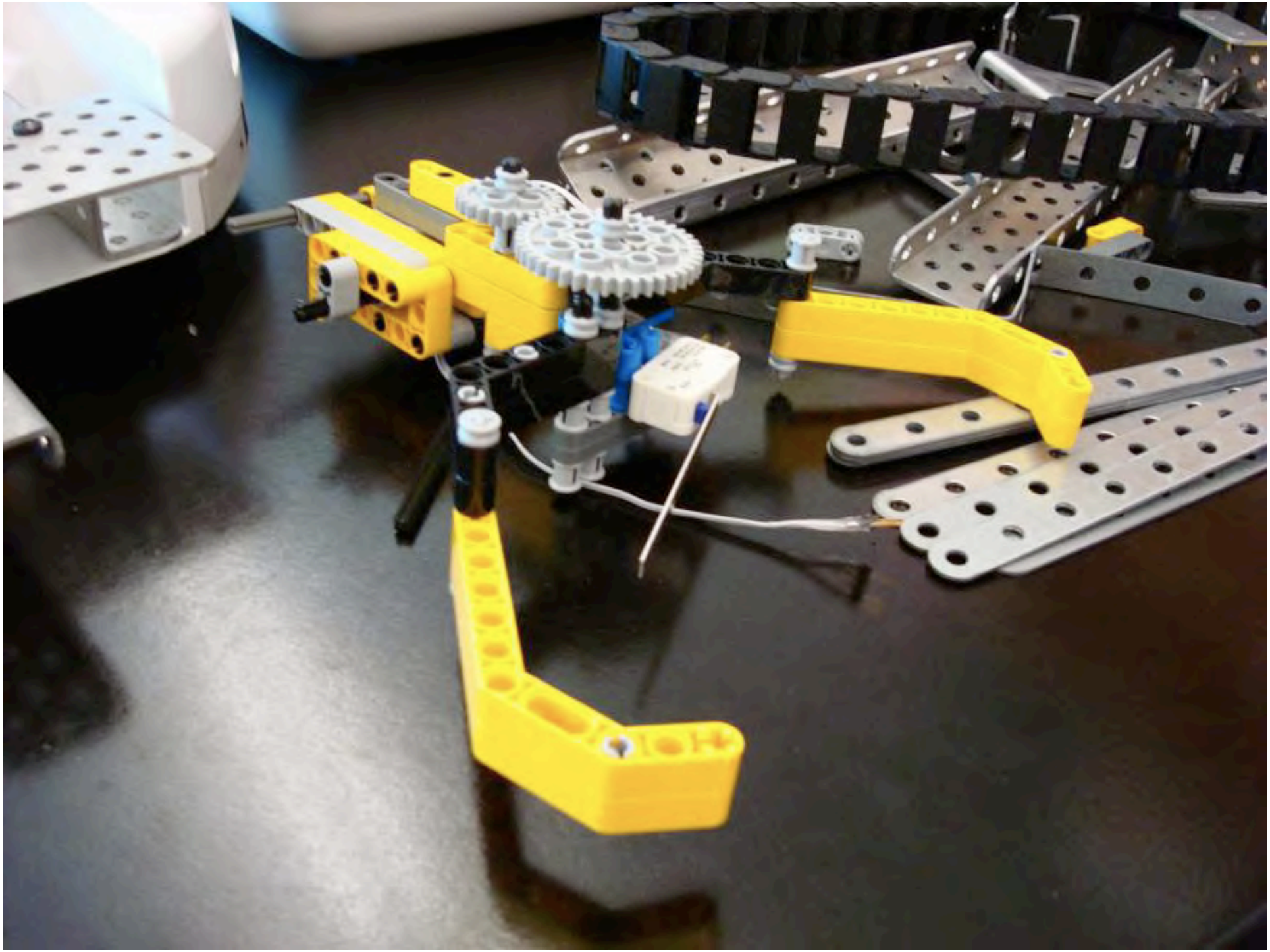
This robot is based on a create, with a large superstructure built on top of the cargo
area in the rear. At the very top, there is a very long claw made out of metal straps
that are bolted together, with a lego hand at the end. It rests inside of a U shaped
lego device that is attached to the jack screw's output. The jack screw is held in
place by a motor with a provided motor mount, and a lego axle that runs across the
structure.

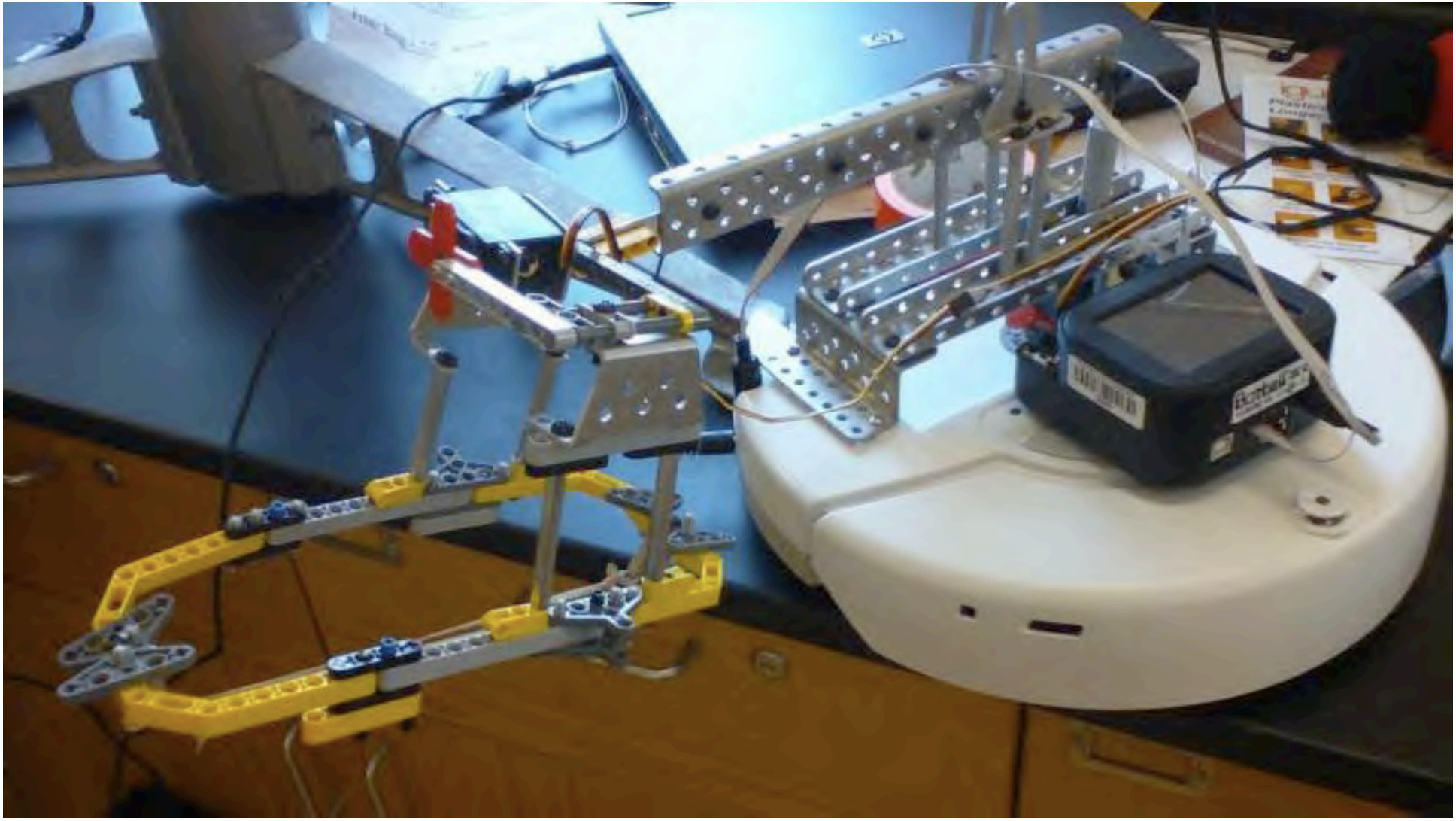


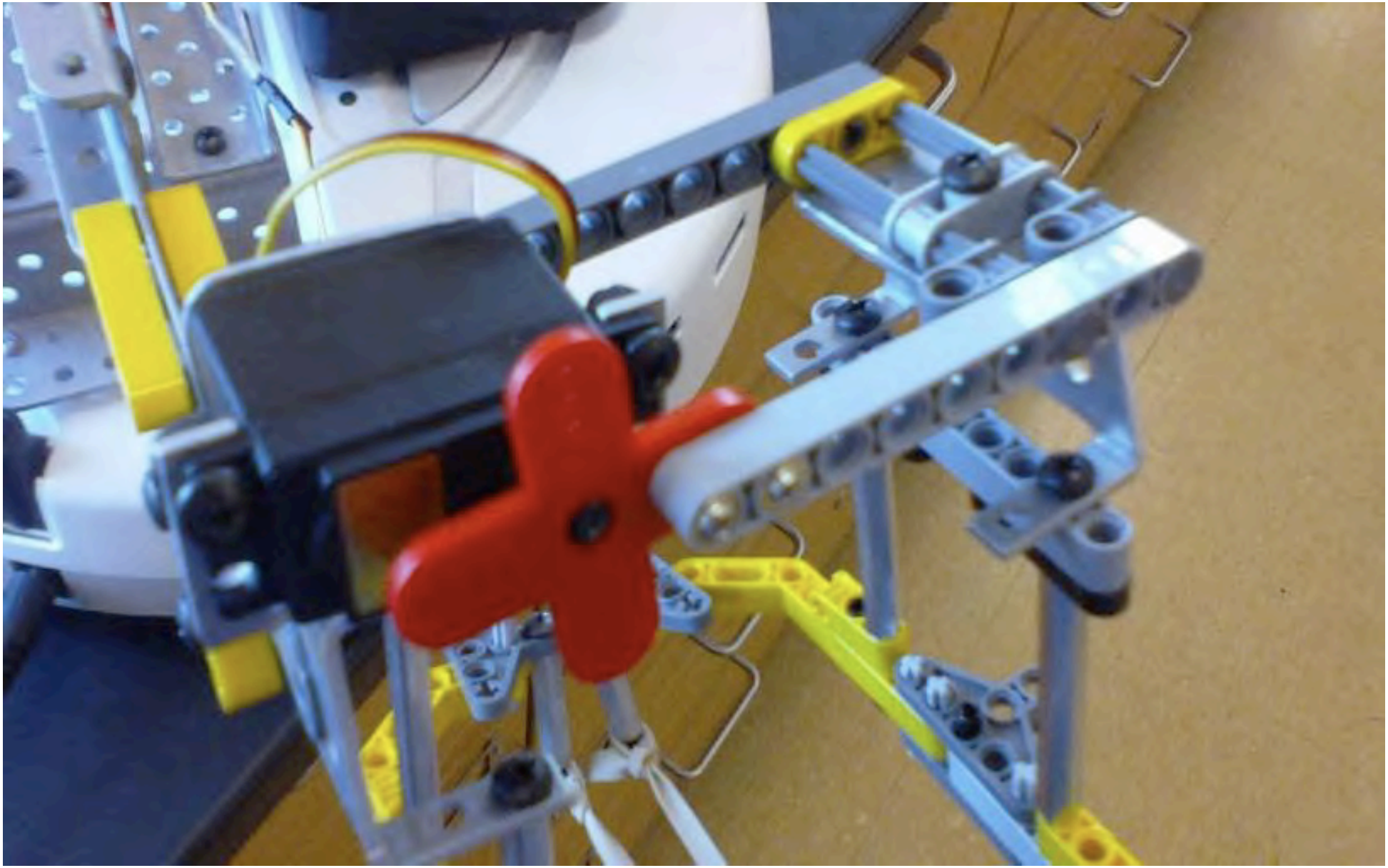



Bordallero

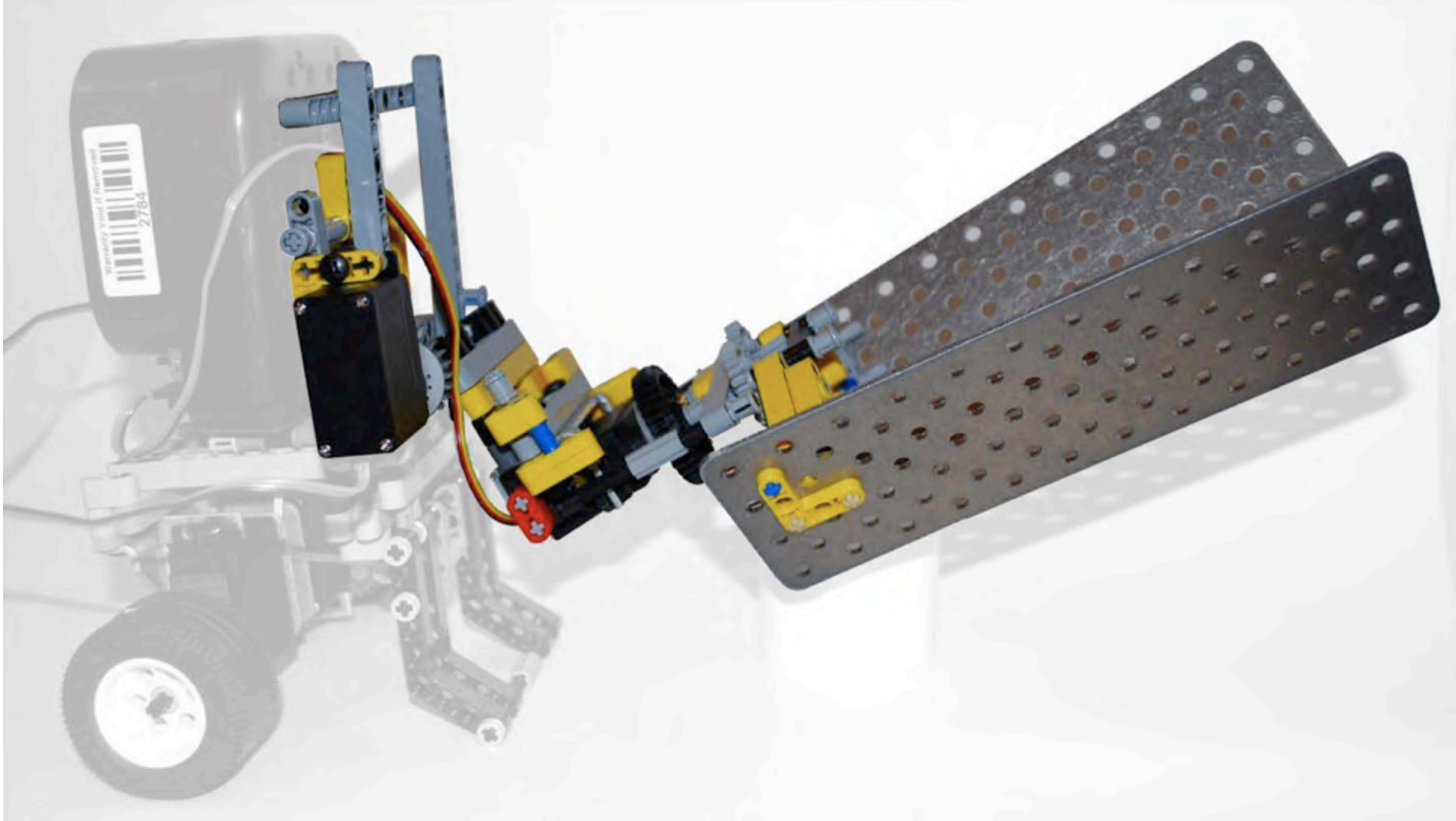




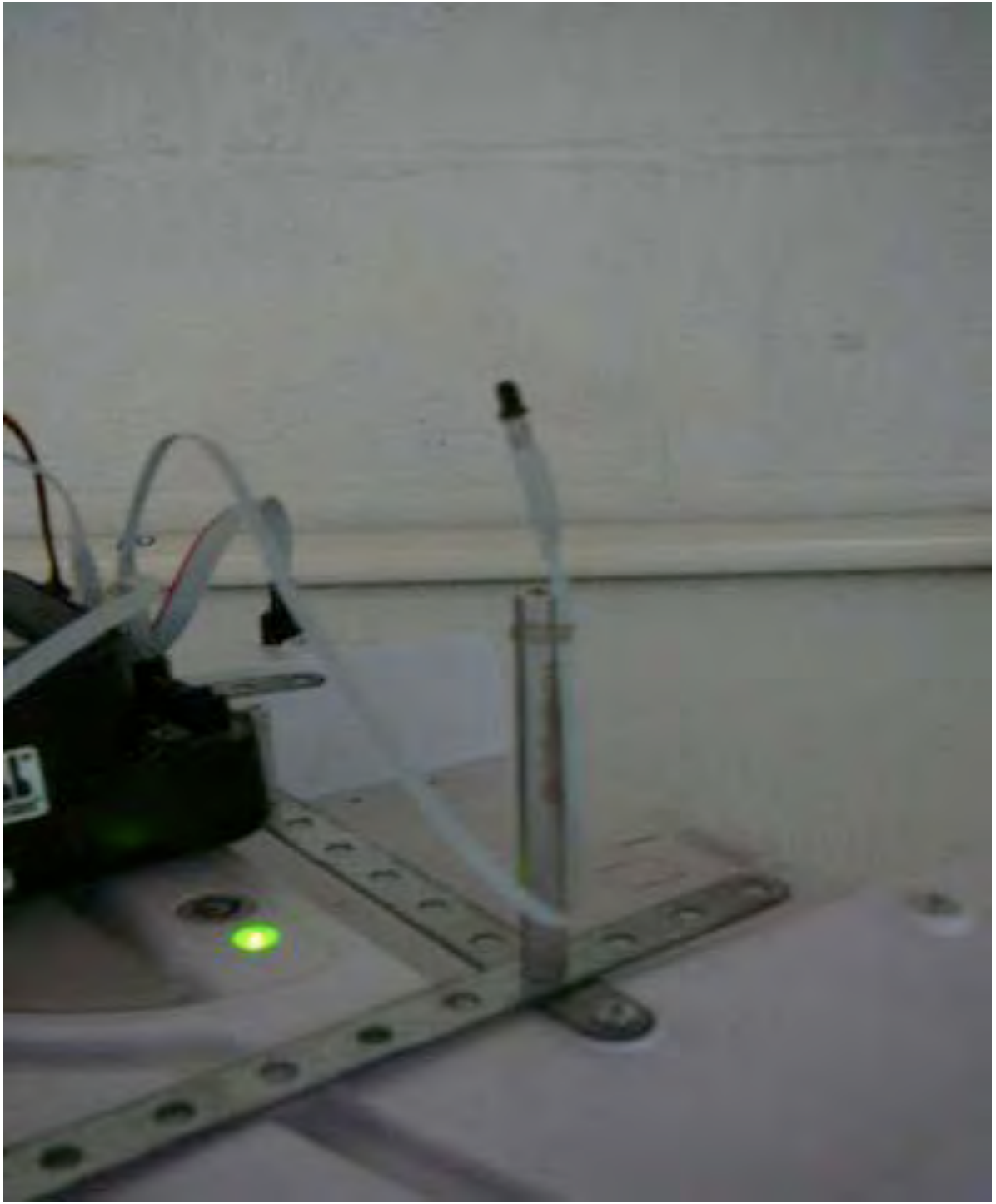




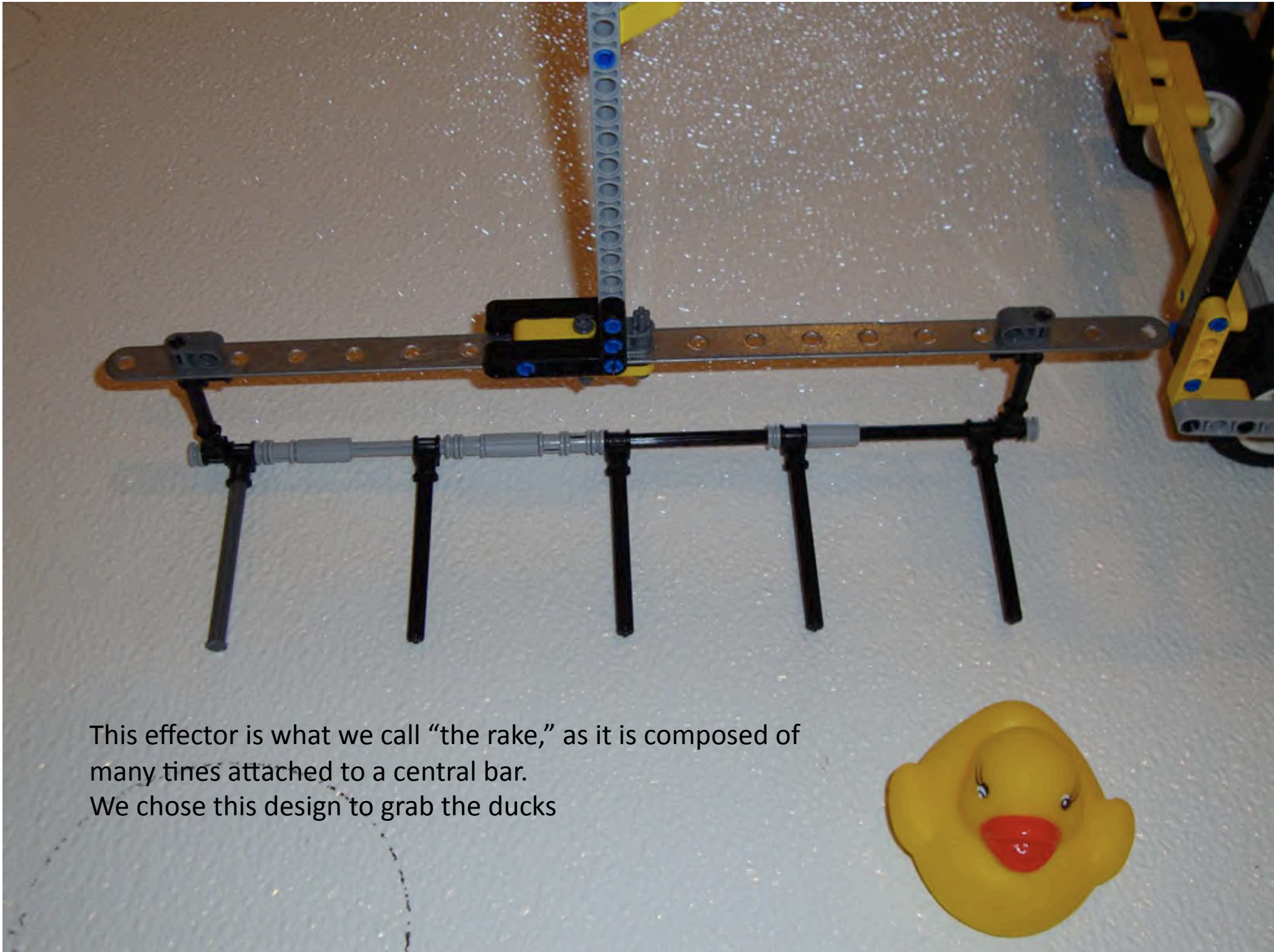
Our claw consists primarily of a motor and a servo, a servo to control the “hand” of the mechanism and a motor to control how the entire mechanism moves vertically. The servo pictured to the right controls the hand. The servo controls how much it opens and closes.



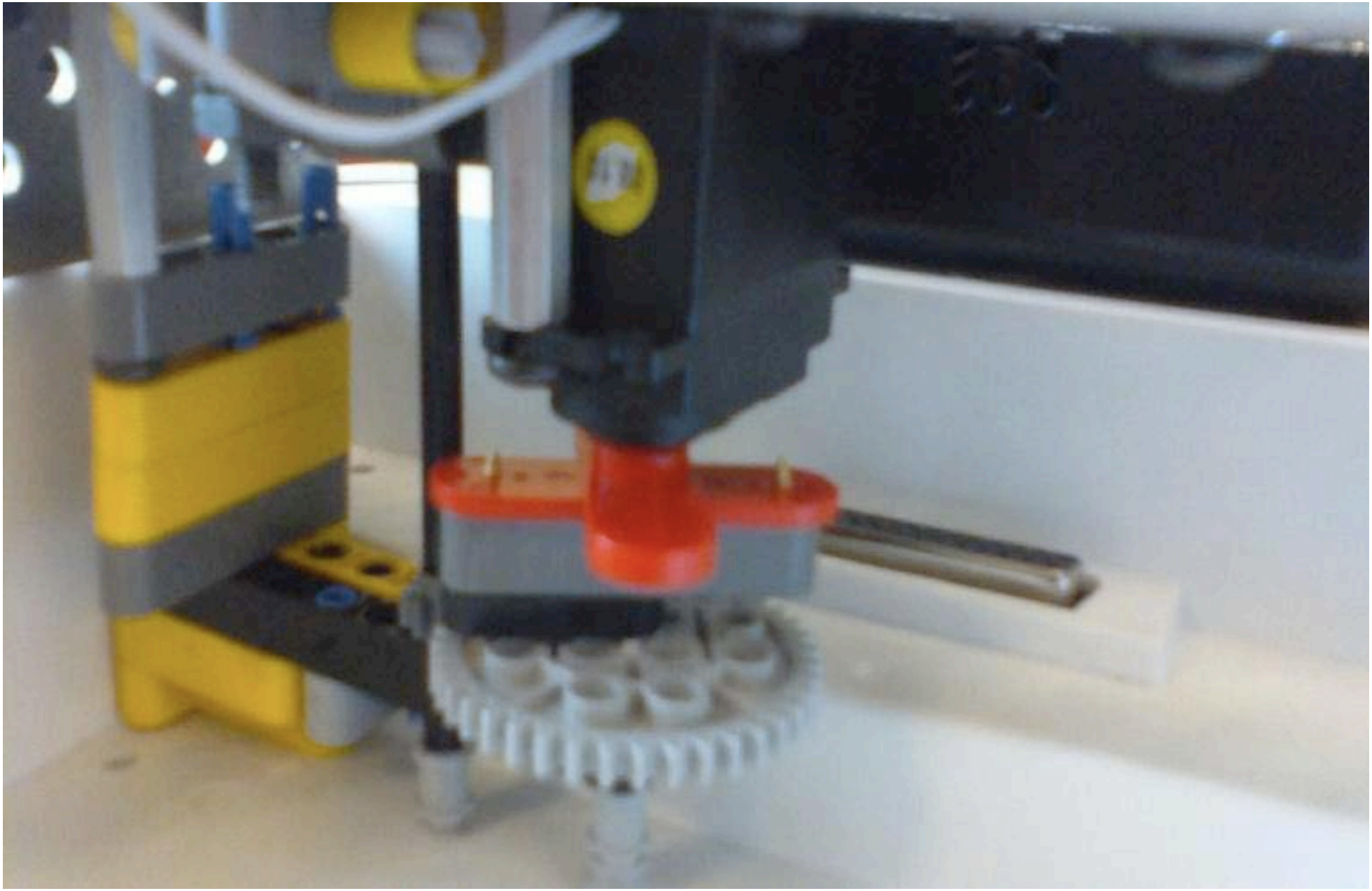
Our effector comprises two servos and two large plates. When the leftmost servo in the illustration is activated, the entire effector is moved up and down. When the other servo is activated, the plates close and open like shears.



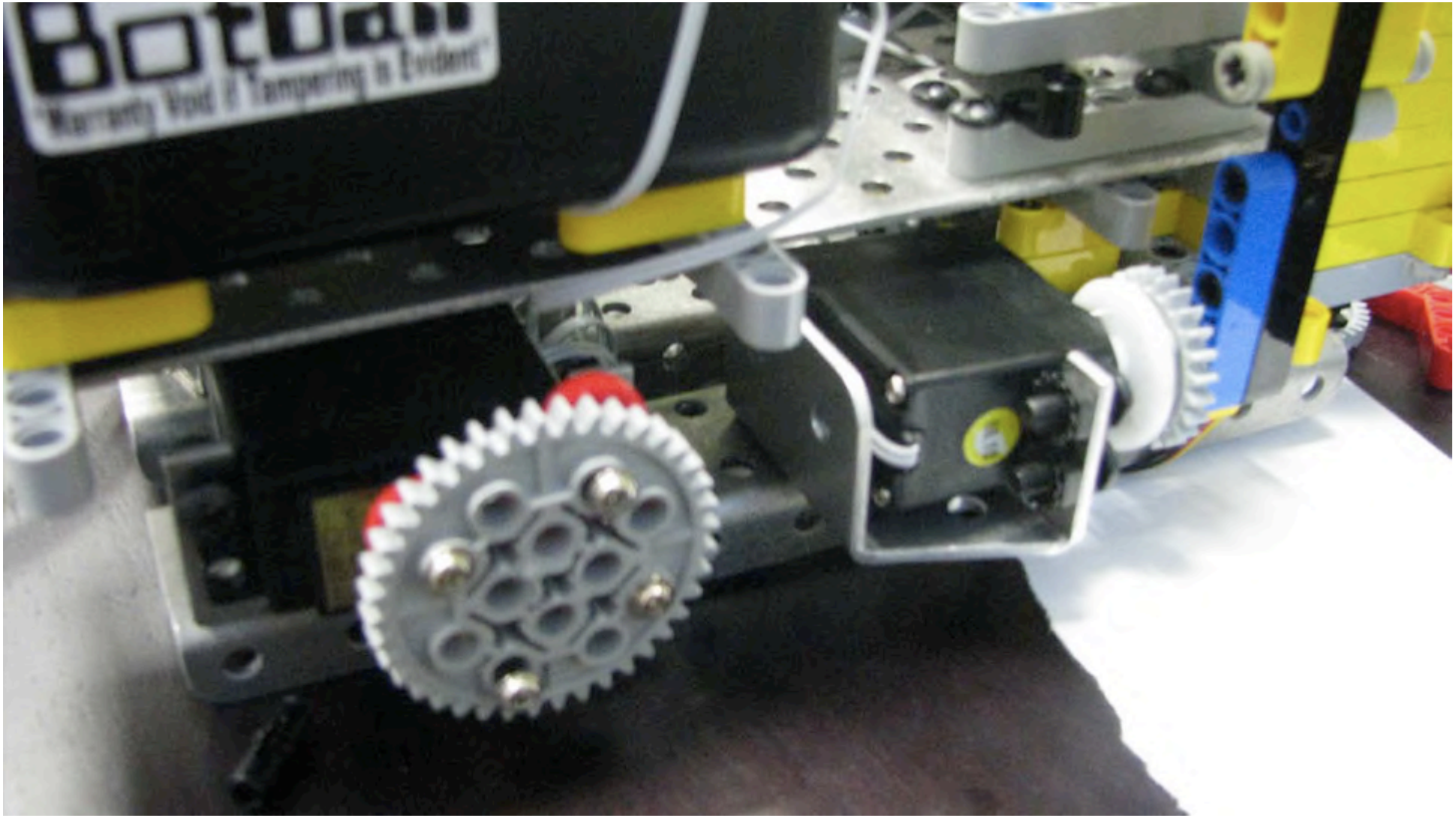
The light sensor is uGlued to a metal rod. We chose this design because the sensor will be a self contained unit that won't be interfered with from other moving parts. We will evaluate it based on light tests, and see the difference in light, making sure each test results in a high enough difference. We will add shielding to the sensor depending on the results of the test.



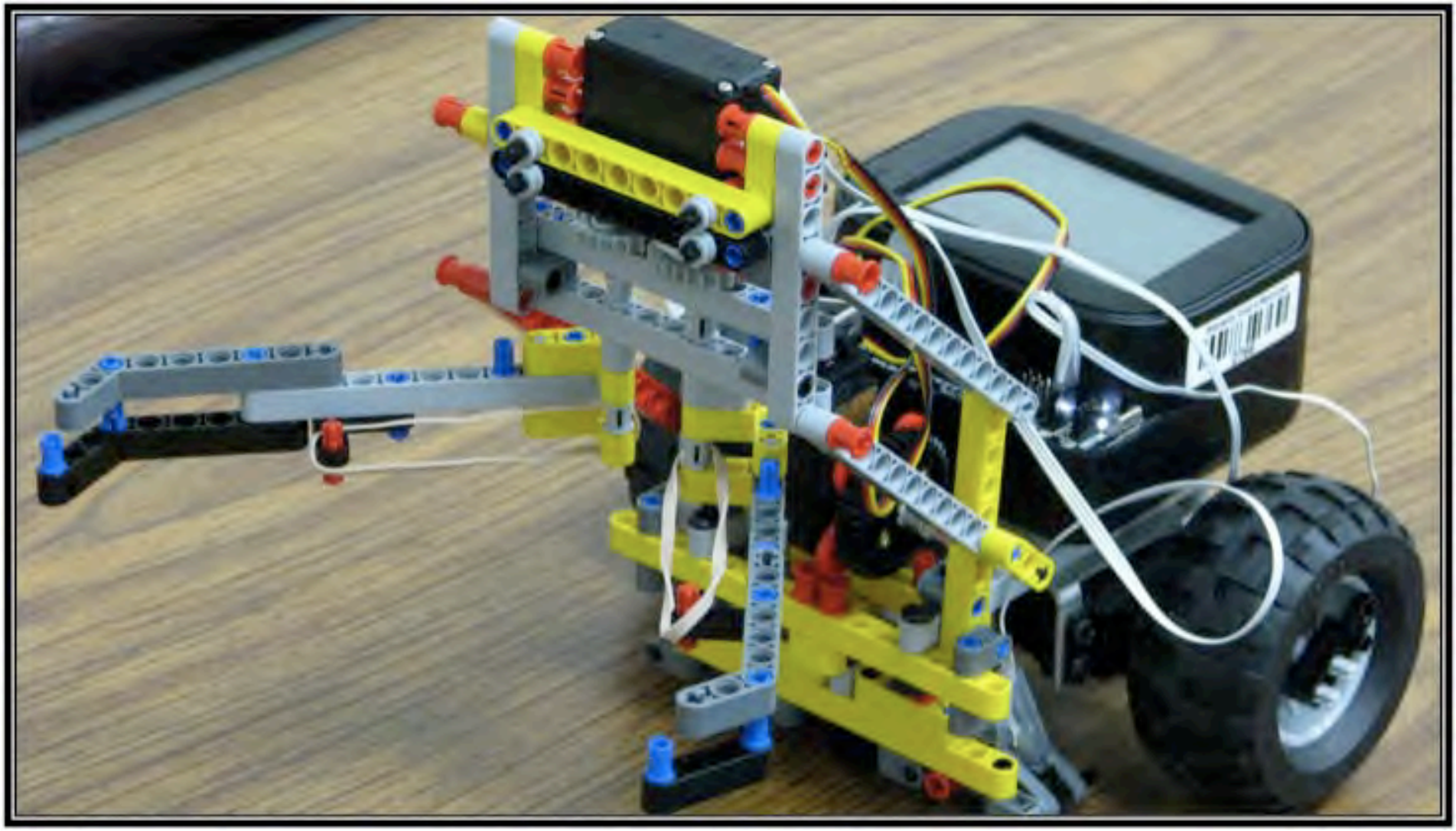
This effector is what we call “the rake,” as it is composed of many tines attached to a central bar.
We chose this design to grab the ducks



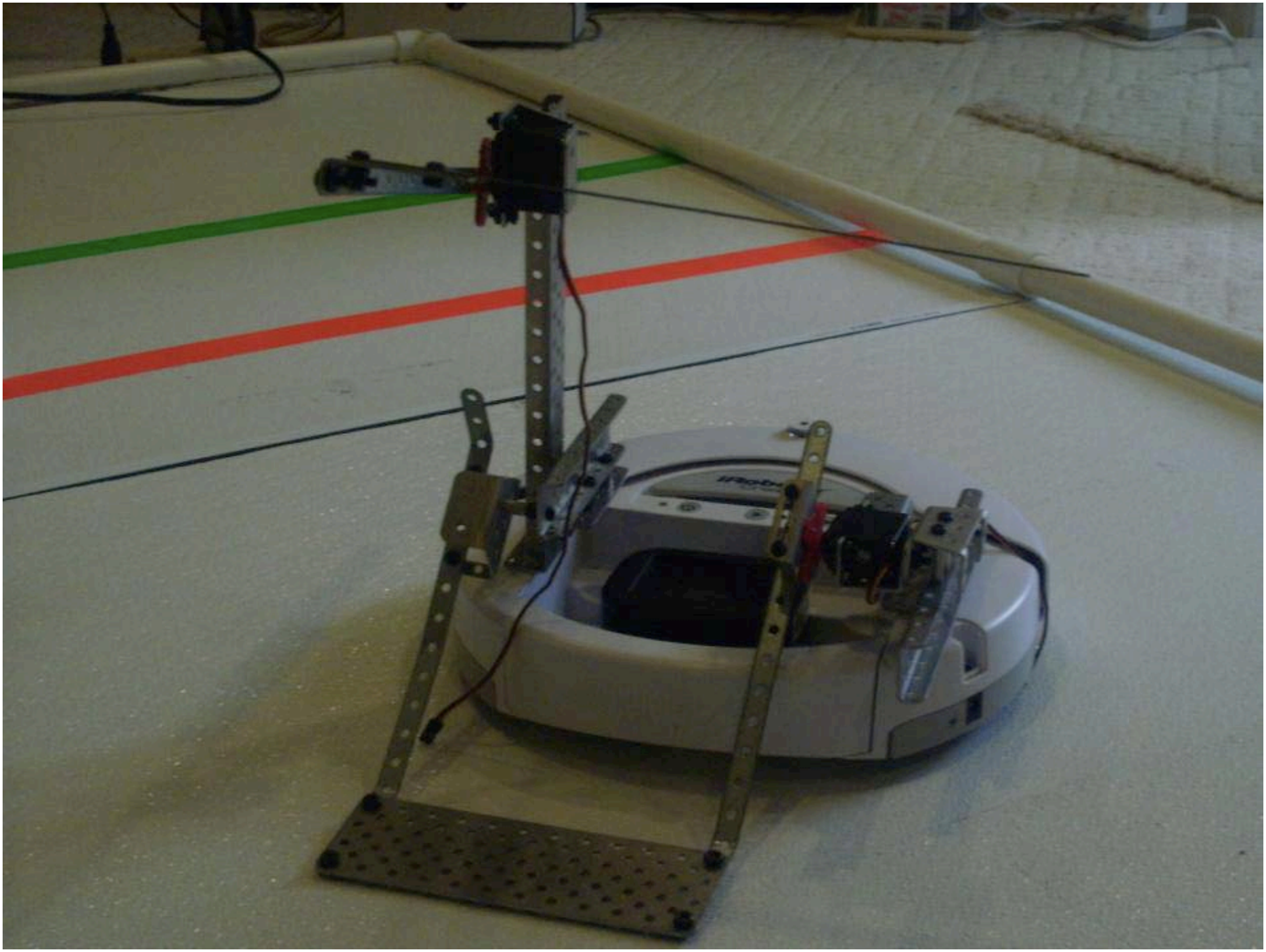
The motor here is the one in control of the claws vertical motion.

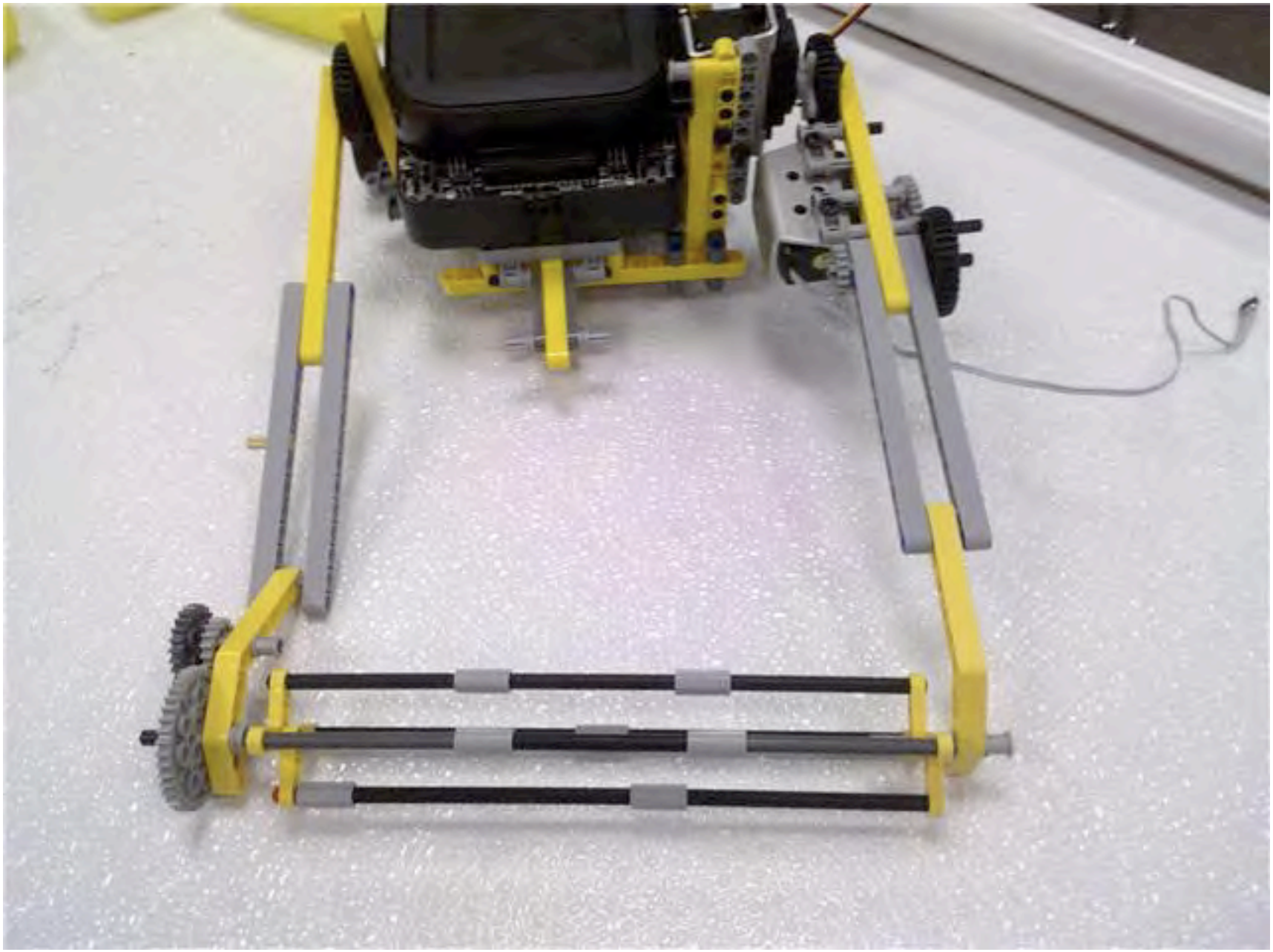


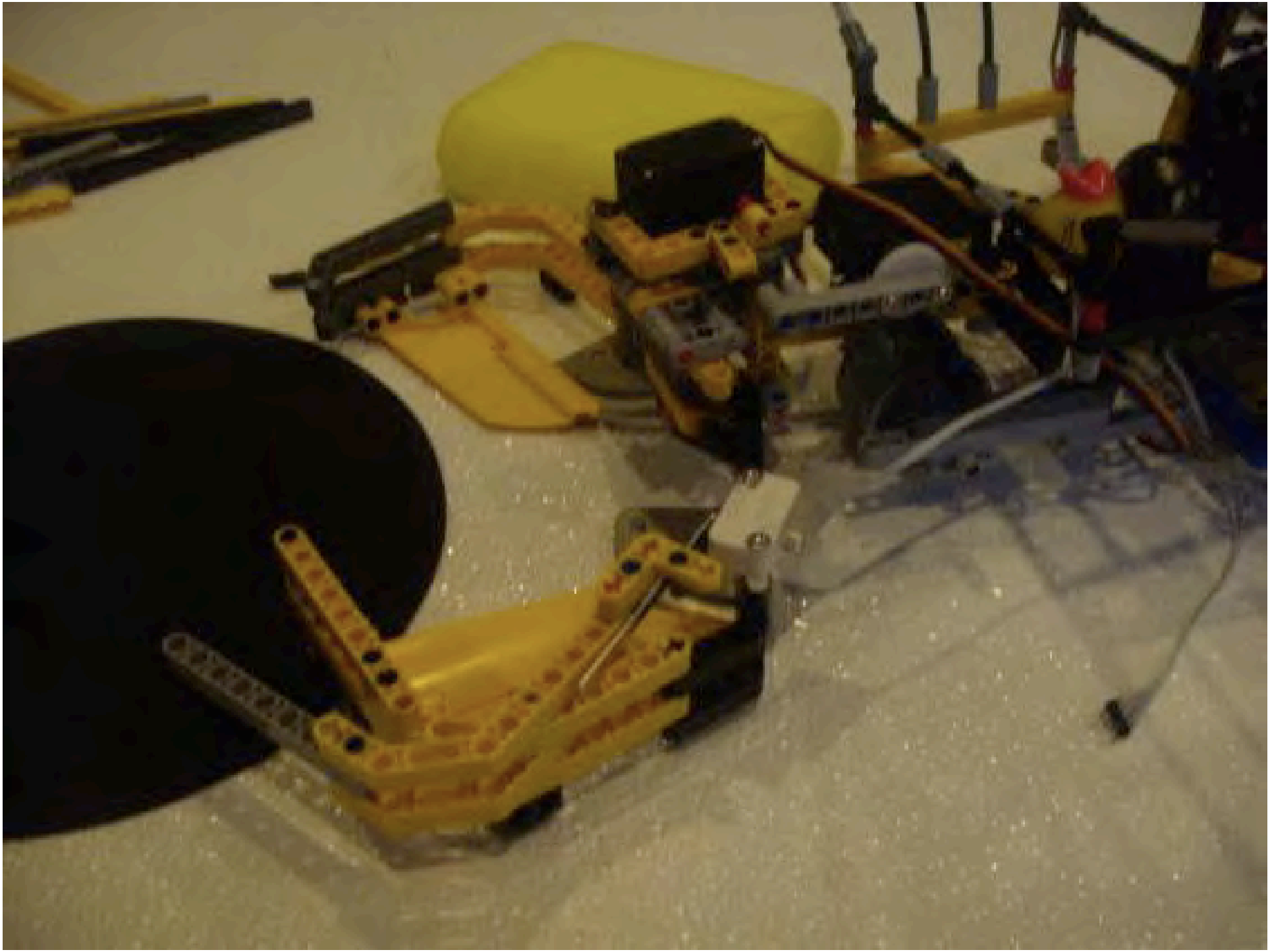
A servo motor (shown to the right) serves as the effector controller by turning a 36-tooth gear, which turns a small bent lift arm, to alter the direction of motion of our attachment. When the bent lift arm turns, the basket on top of the robot tips to the side. This dumps the basket's contents onto the table.

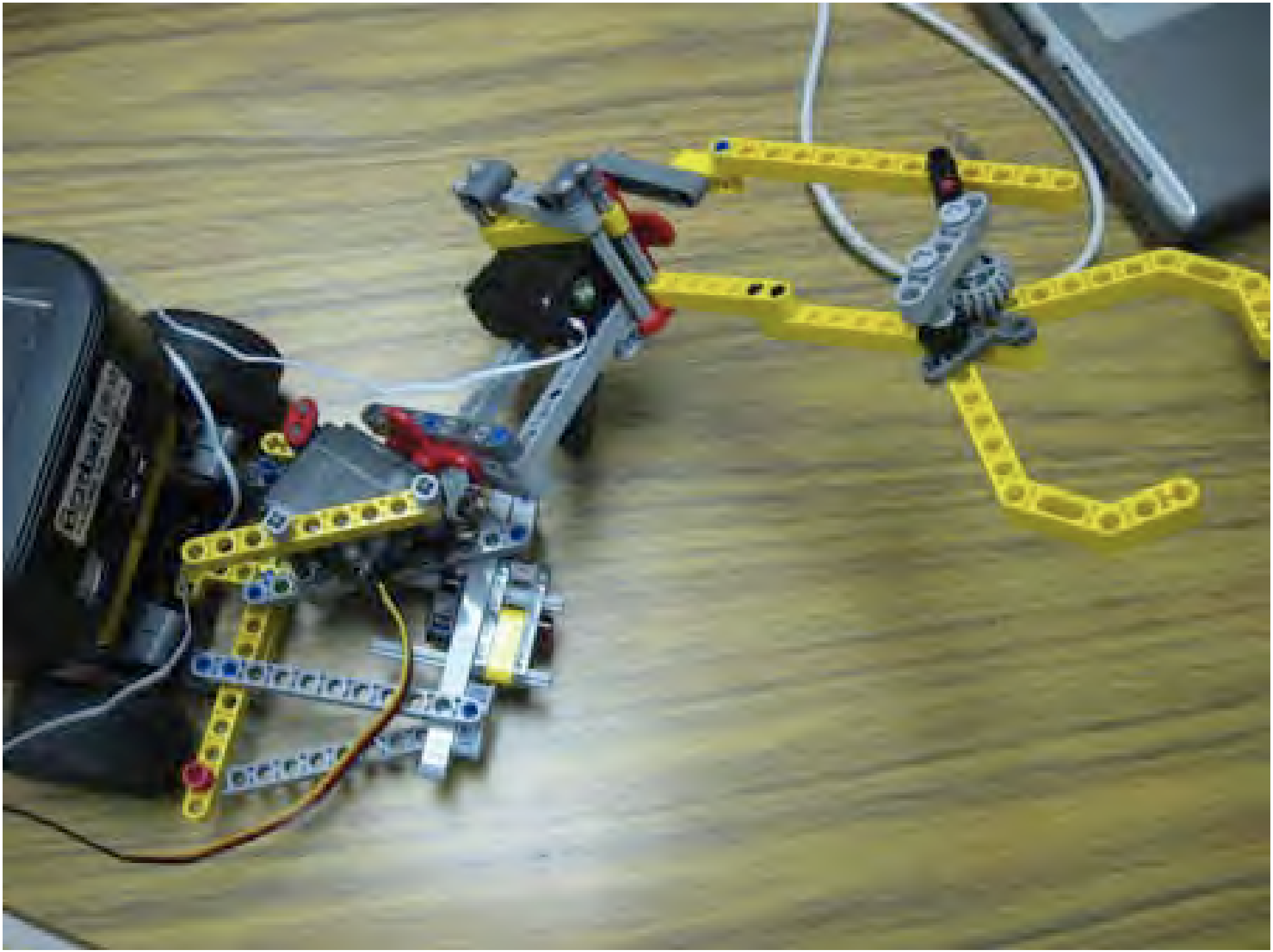


There are two effectors on this CBC robot, a claw and a lift. The claw was created with two angled LEGO pieces, which gives the robot a better grasp of objects. The angled pieces are shaped so multiple pieces can easily fit in the claw. The rubber bands contribute to squeezing the game pieces and keeping them in place.There is also a lift to reach over the PVC pipe. The lift consists of four size 11 LEGO bars, which were attached to the claw servo mount









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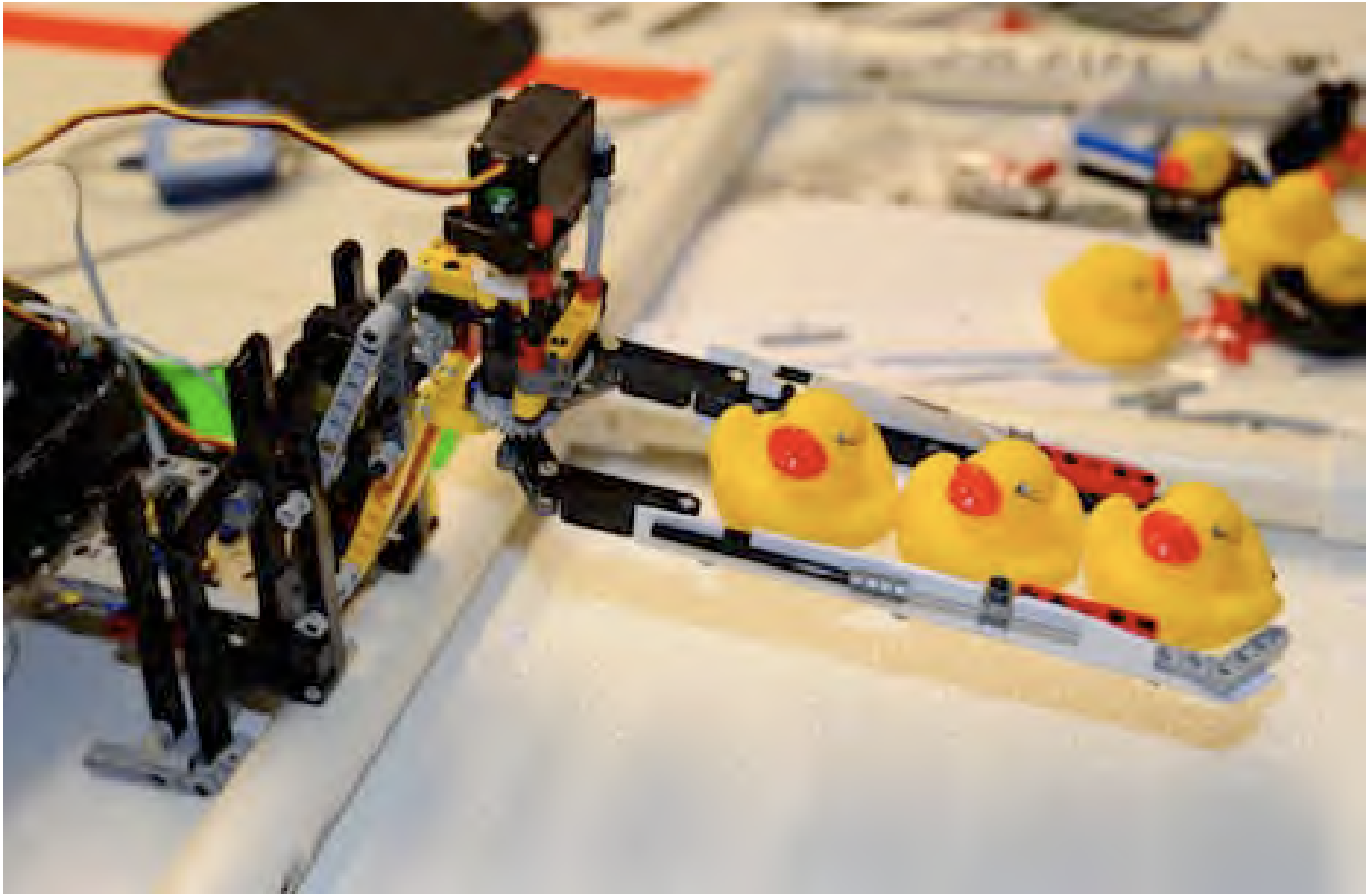

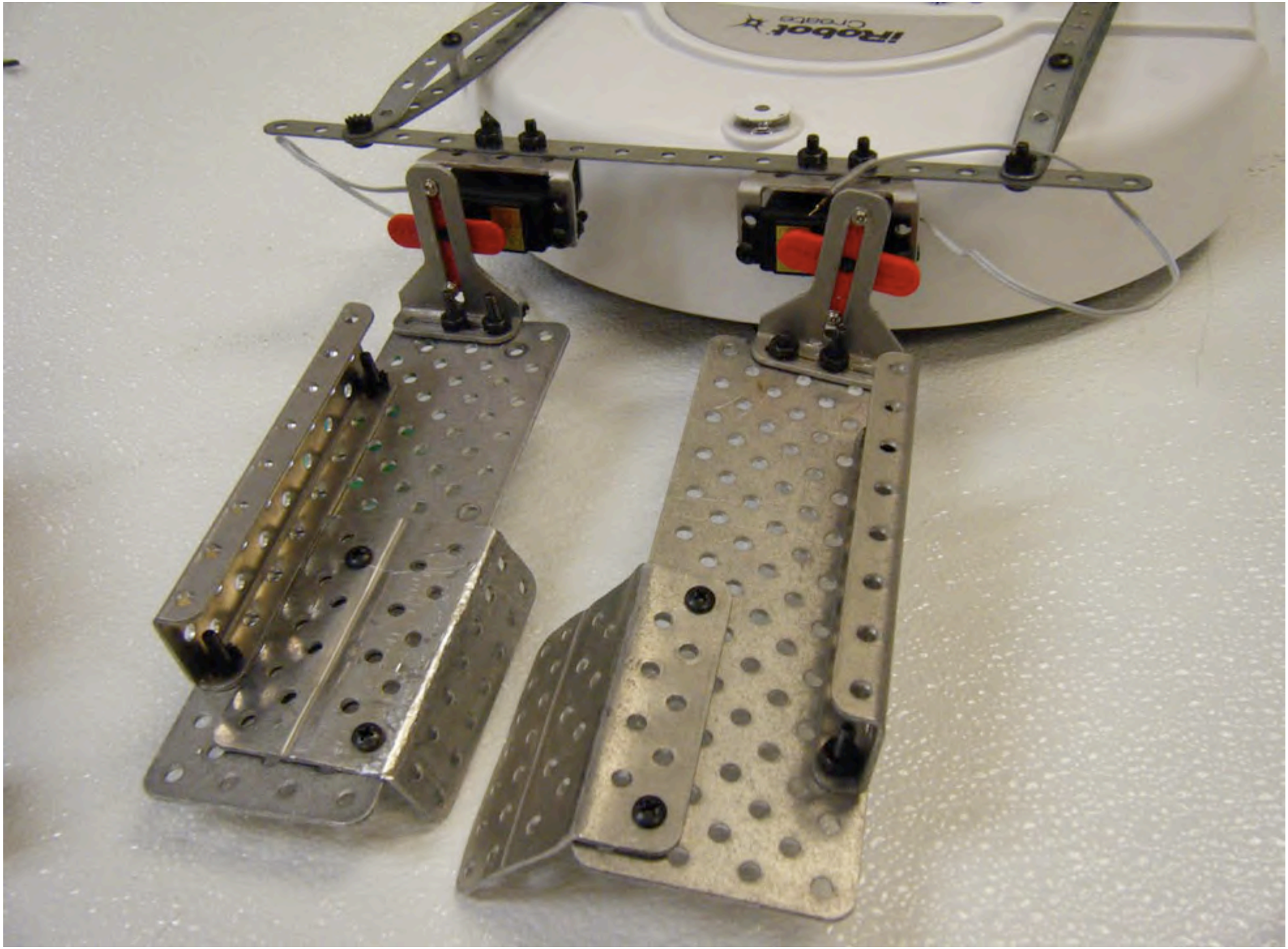
iRobot
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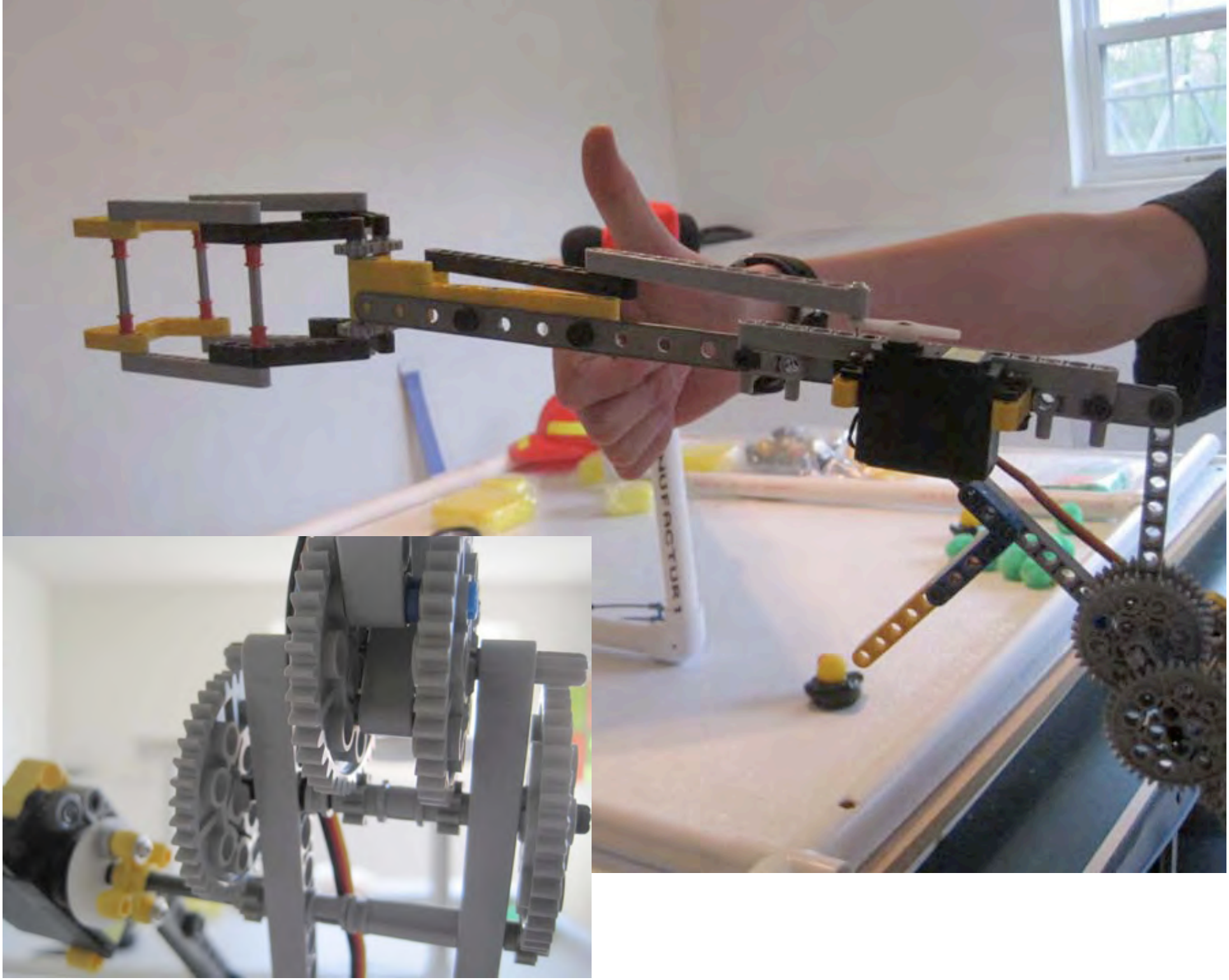
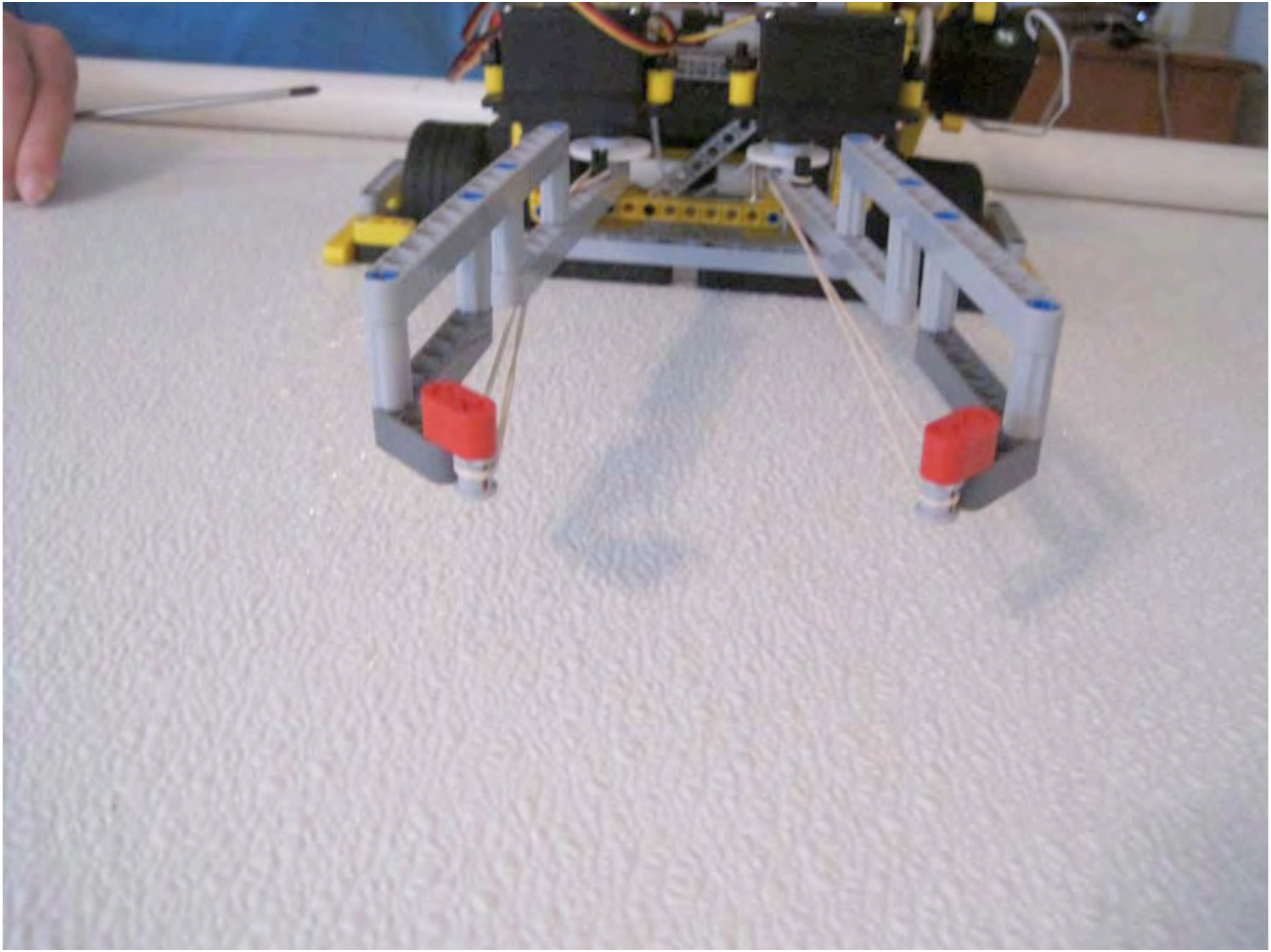
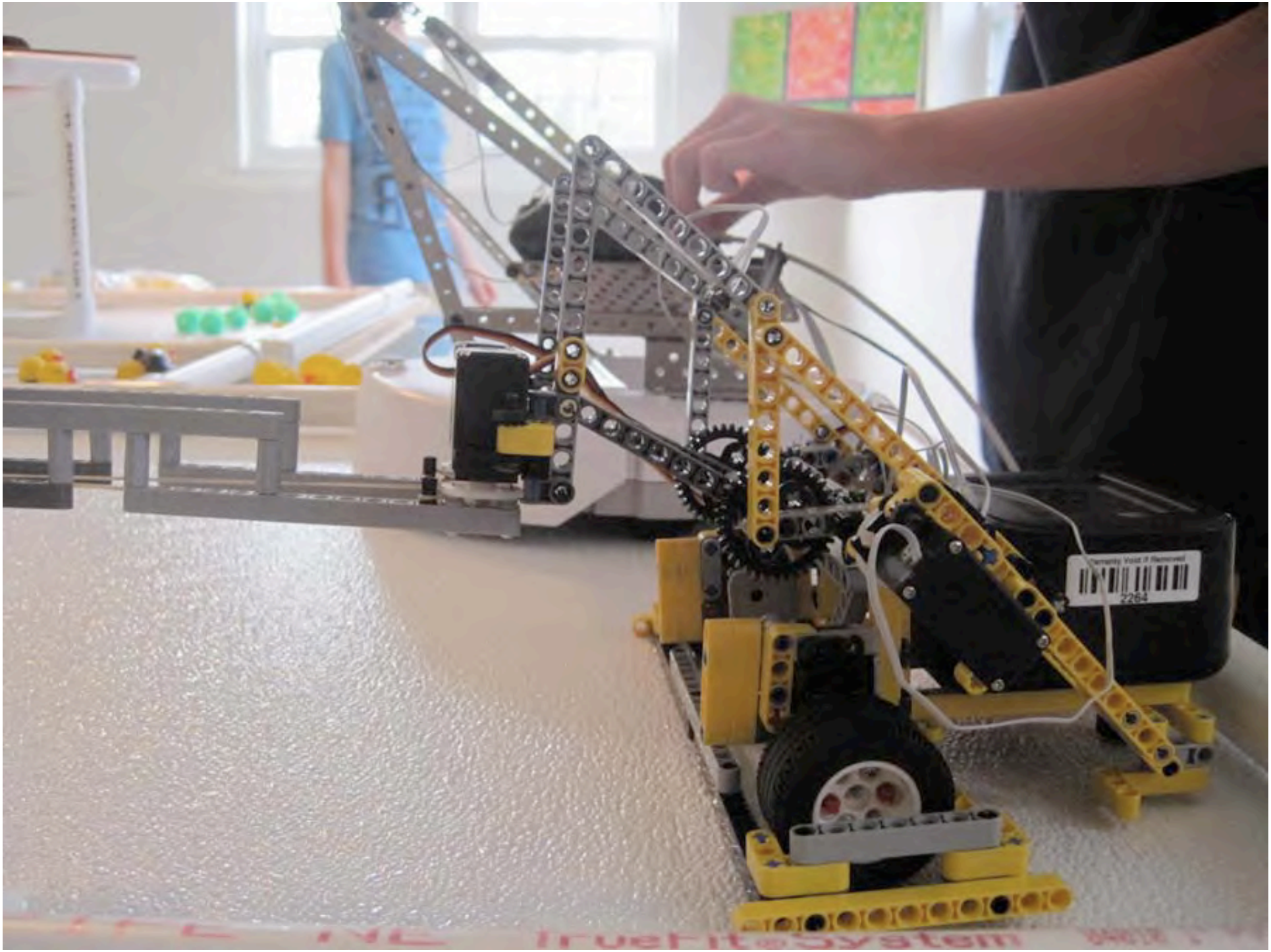
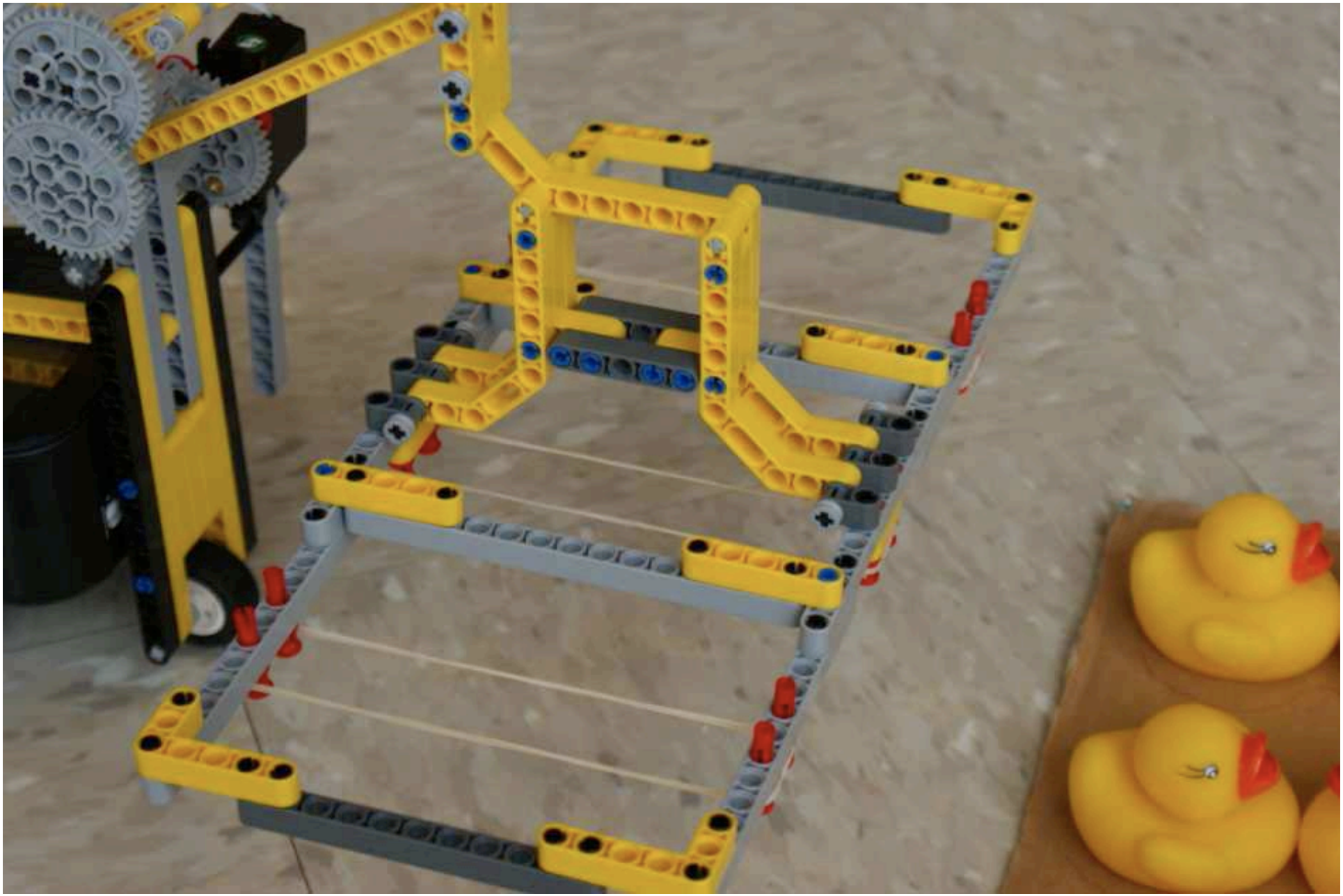
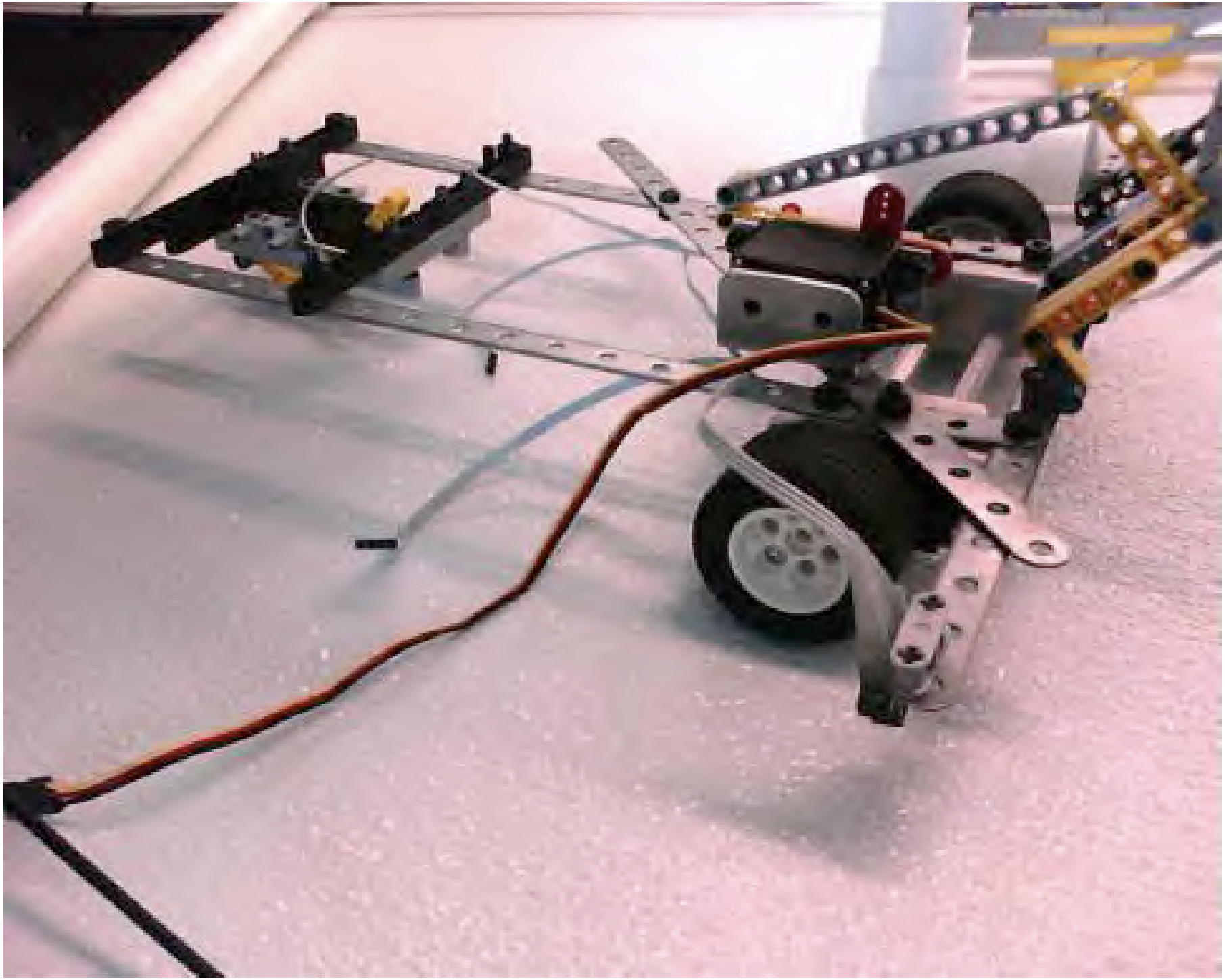
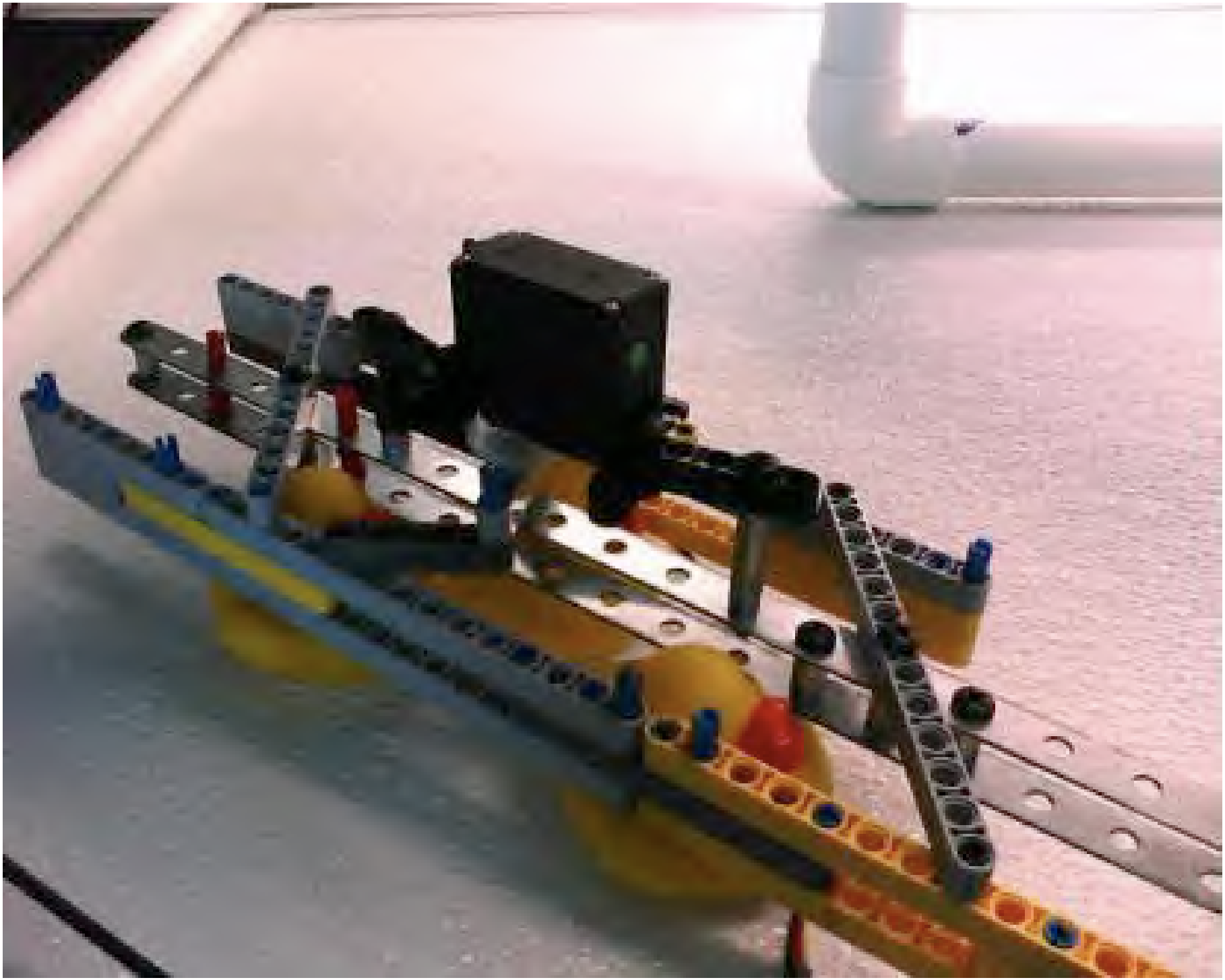


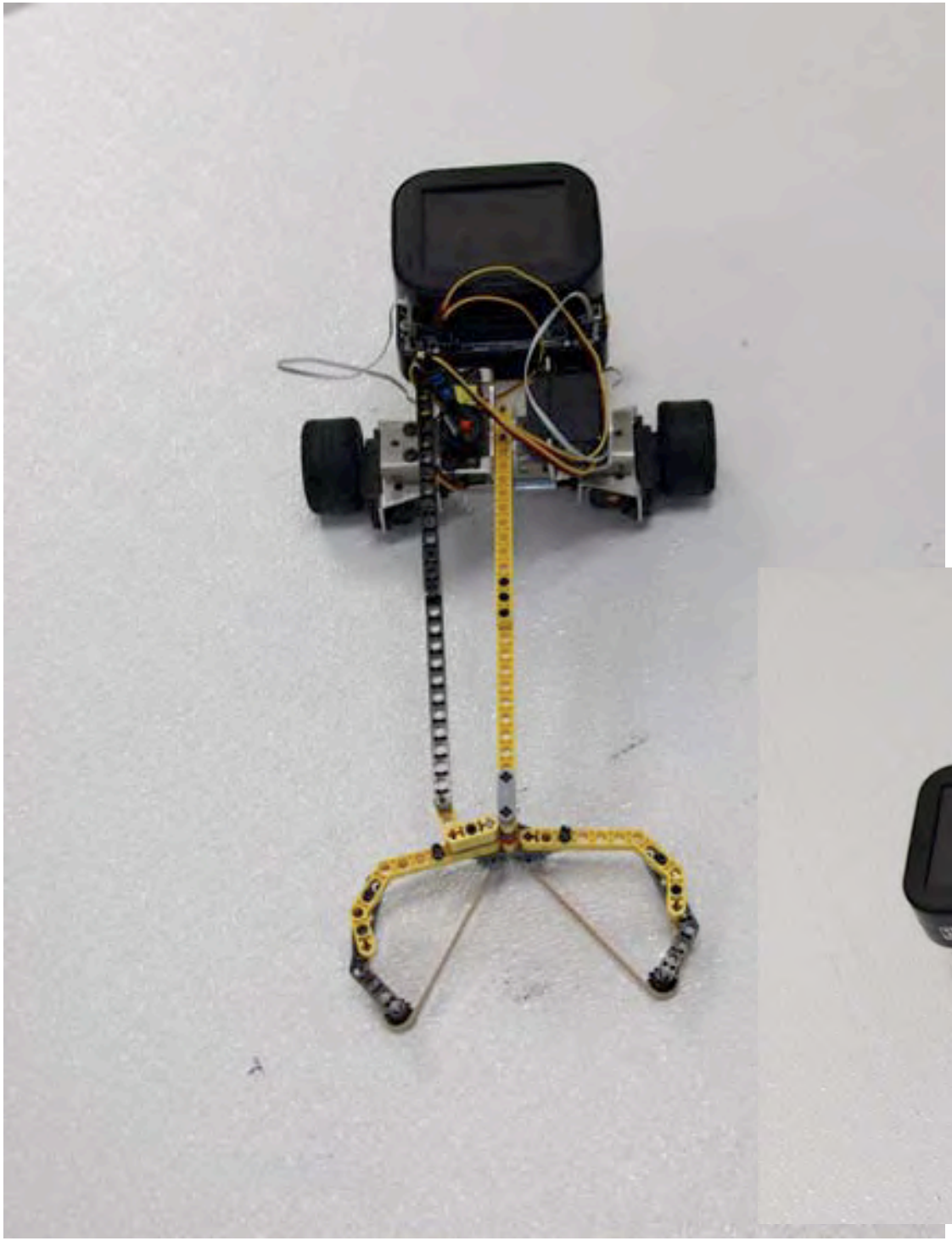


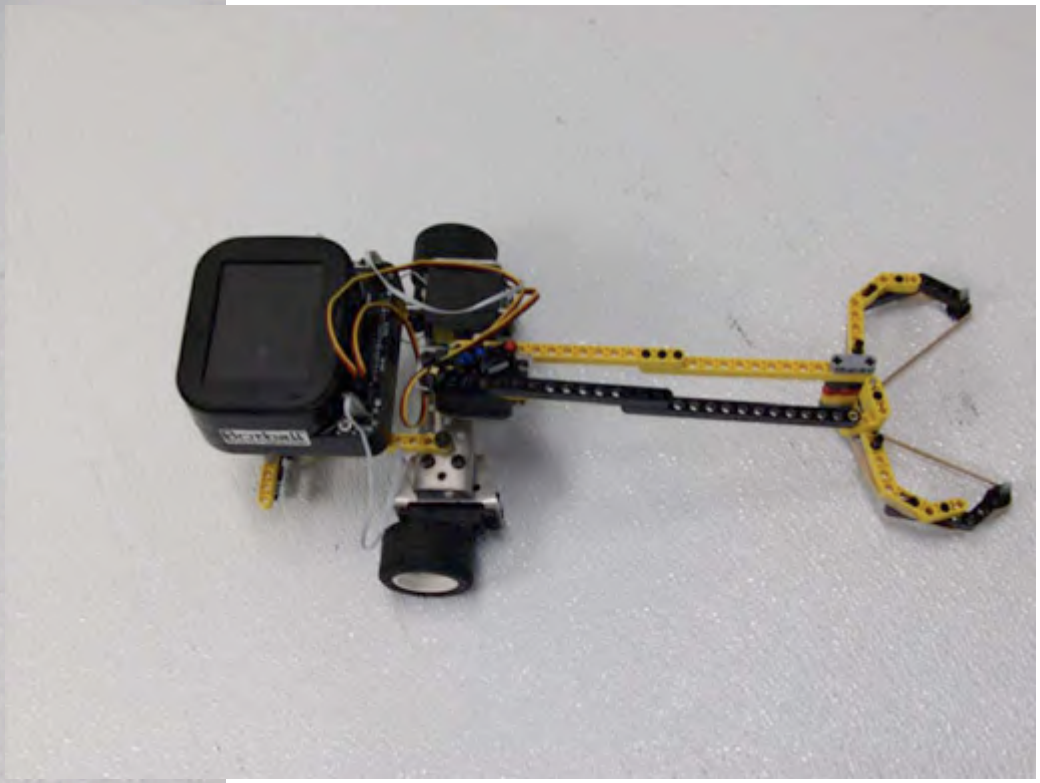

Warranty Void If Removed
2264
TrueFit System

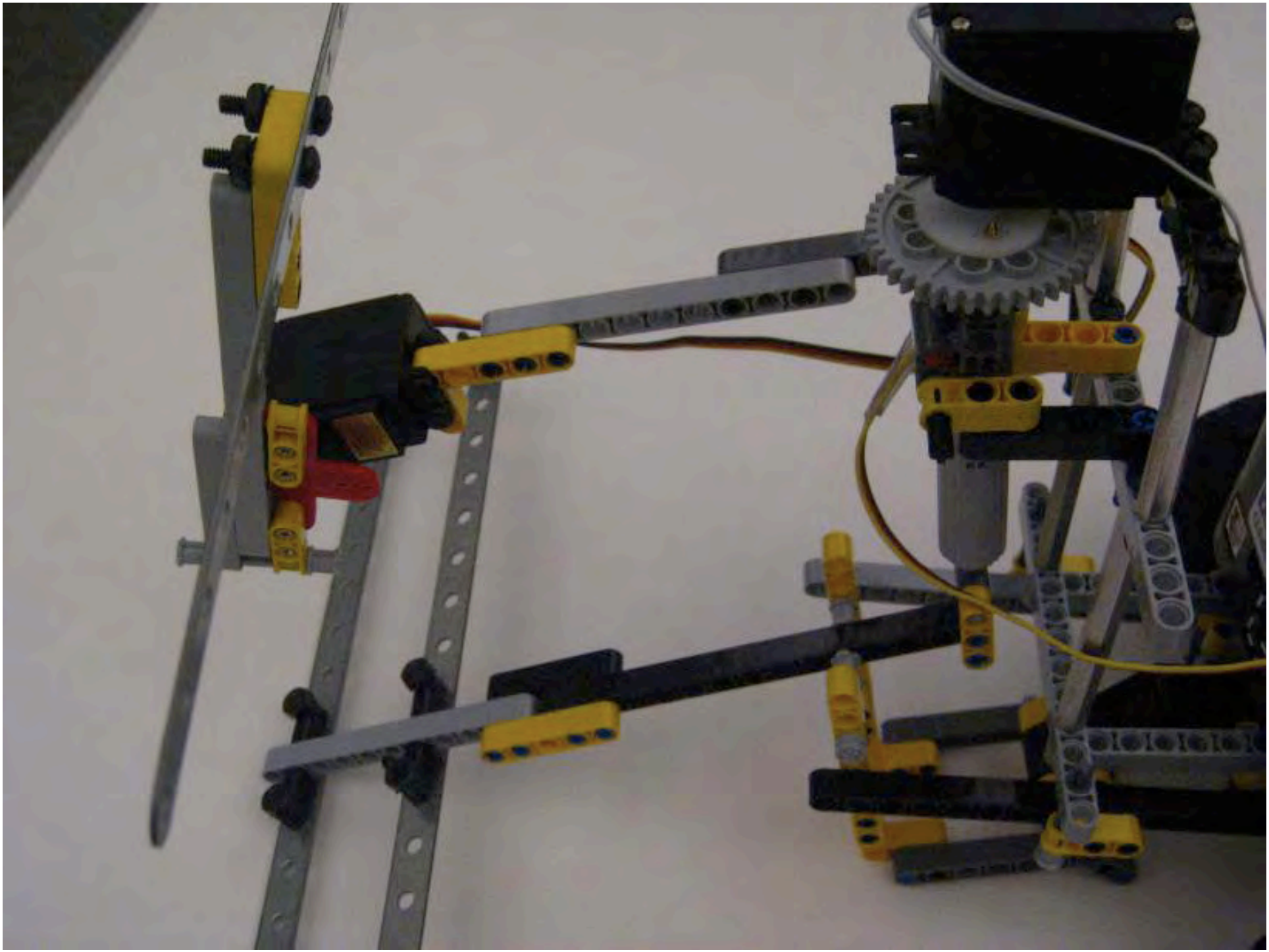


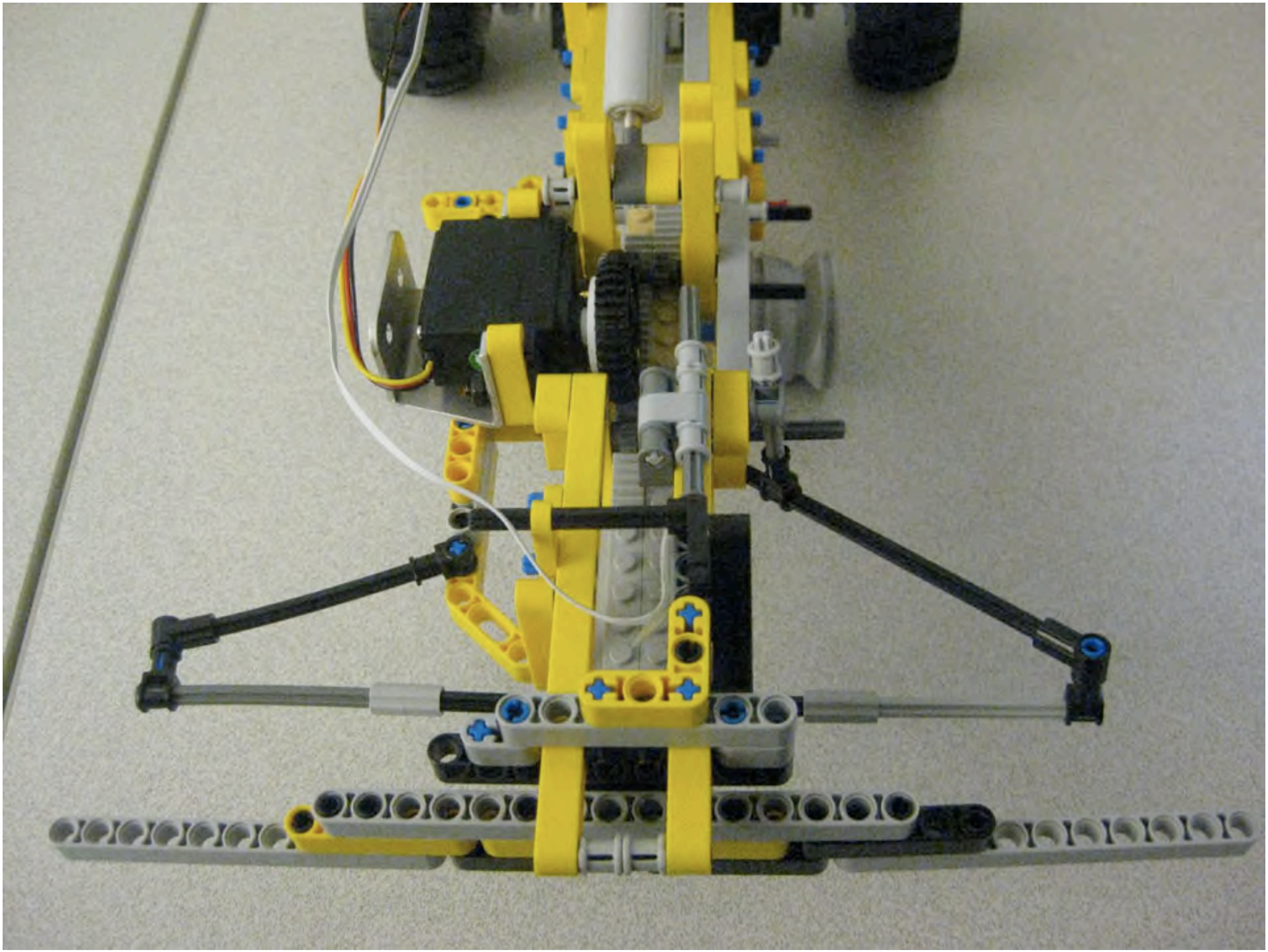


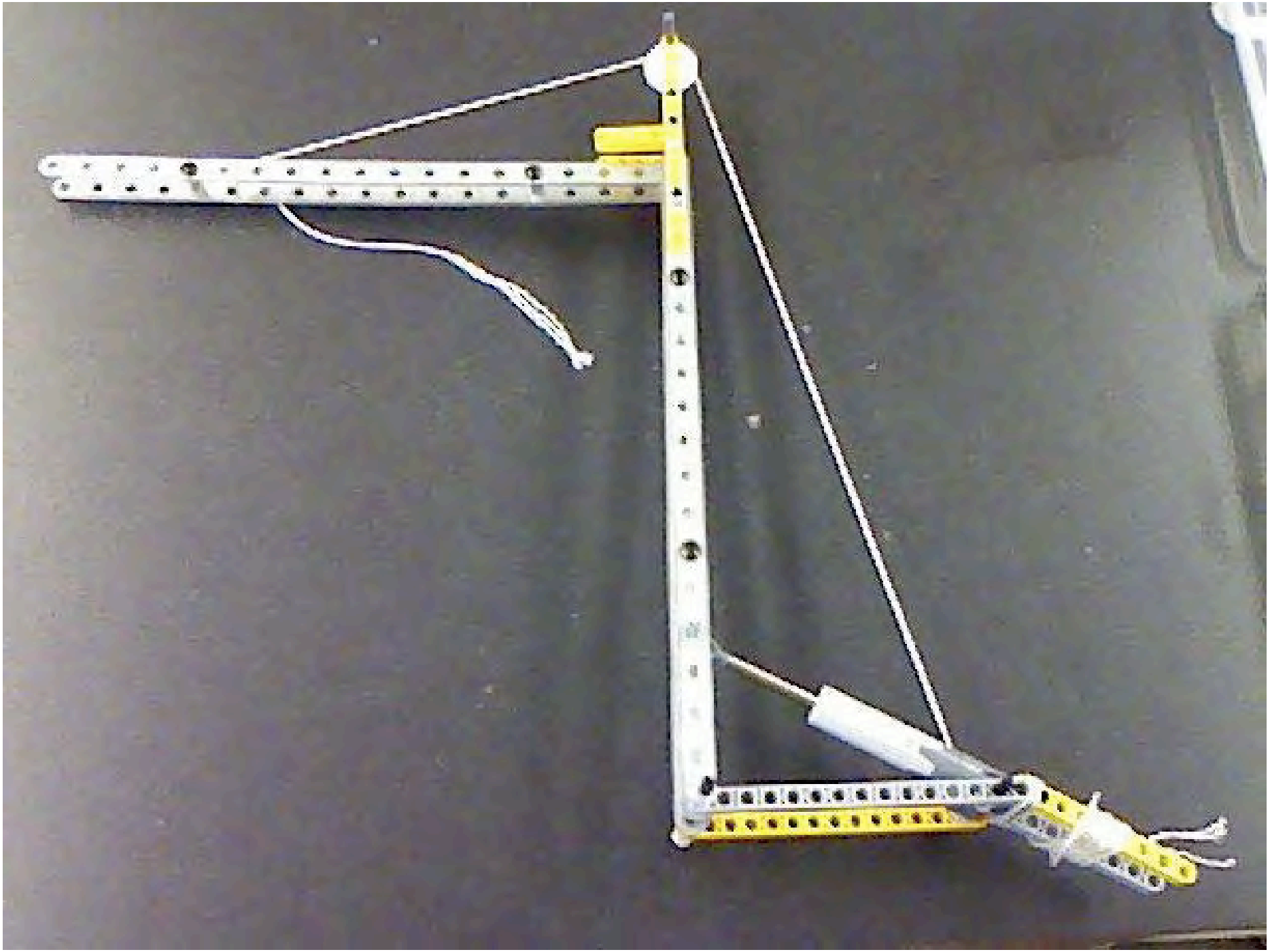


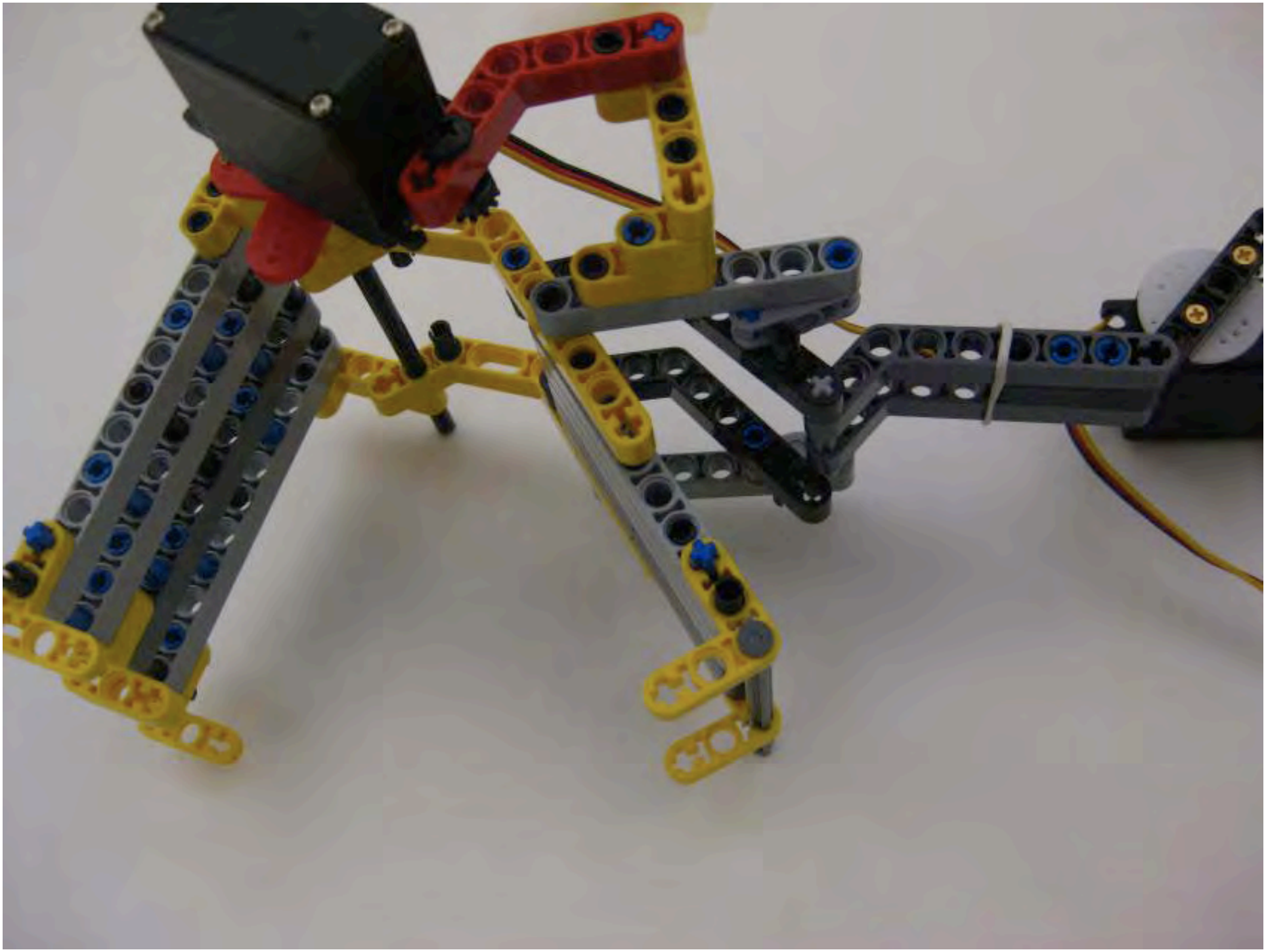


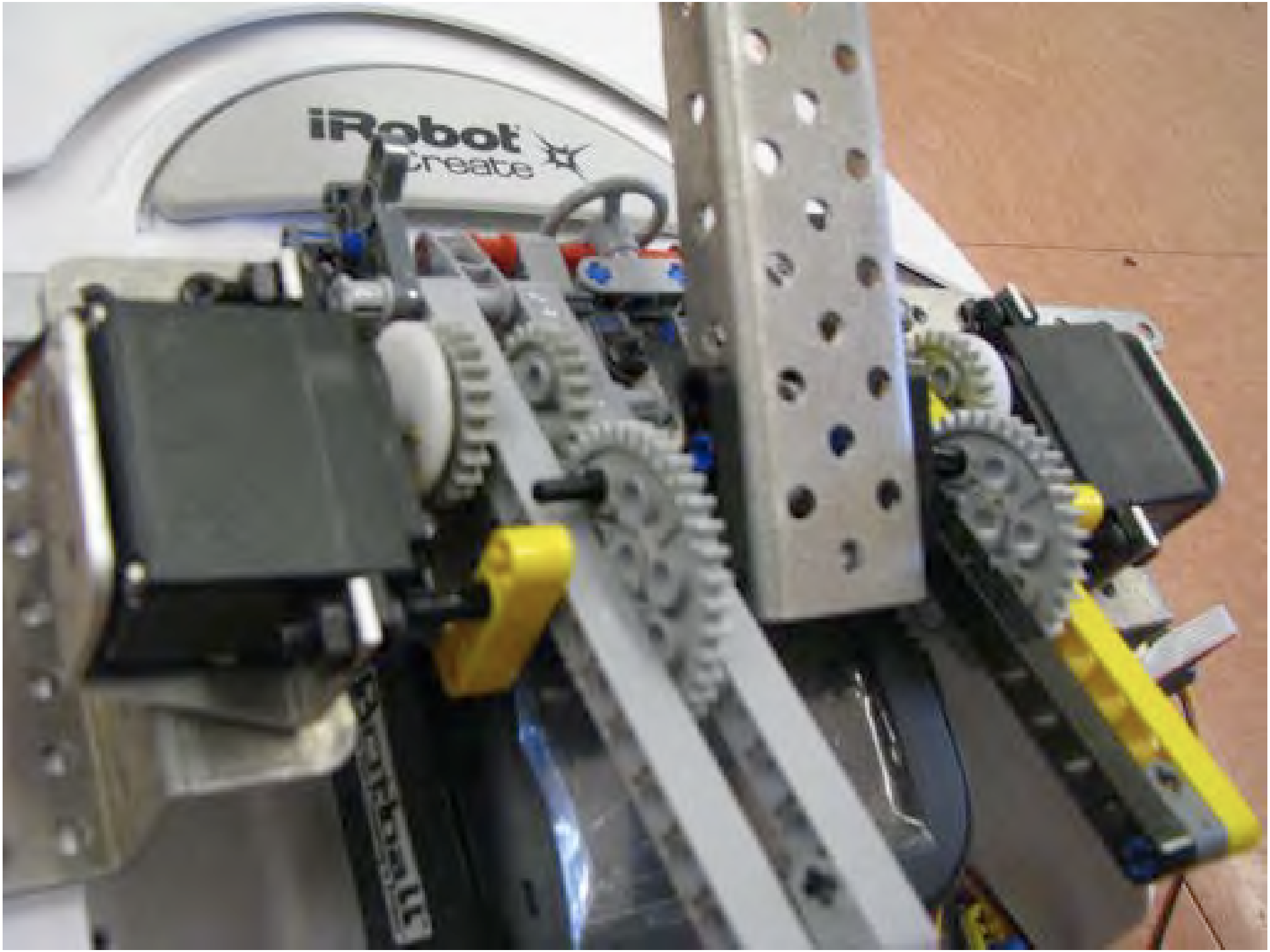








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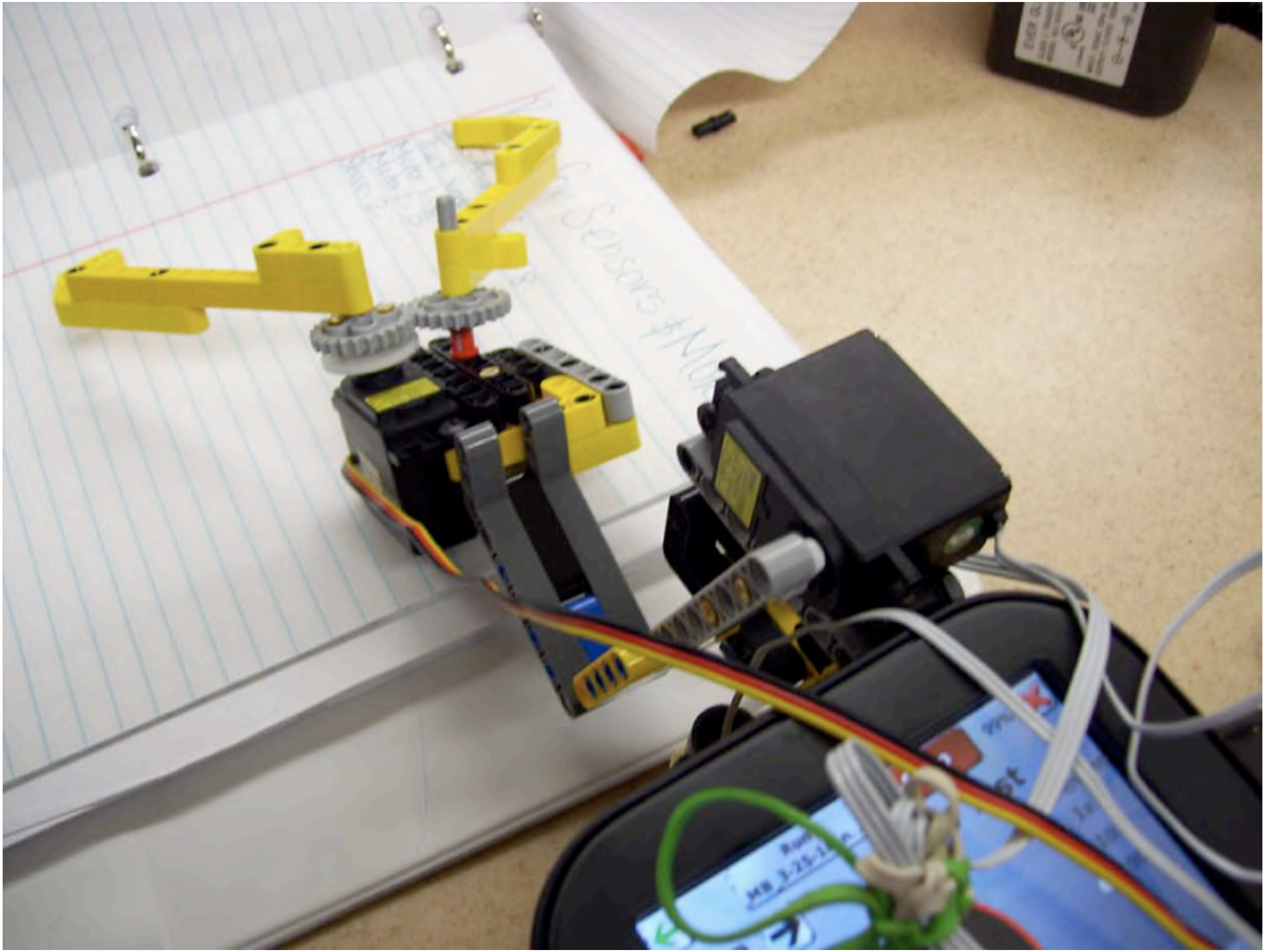
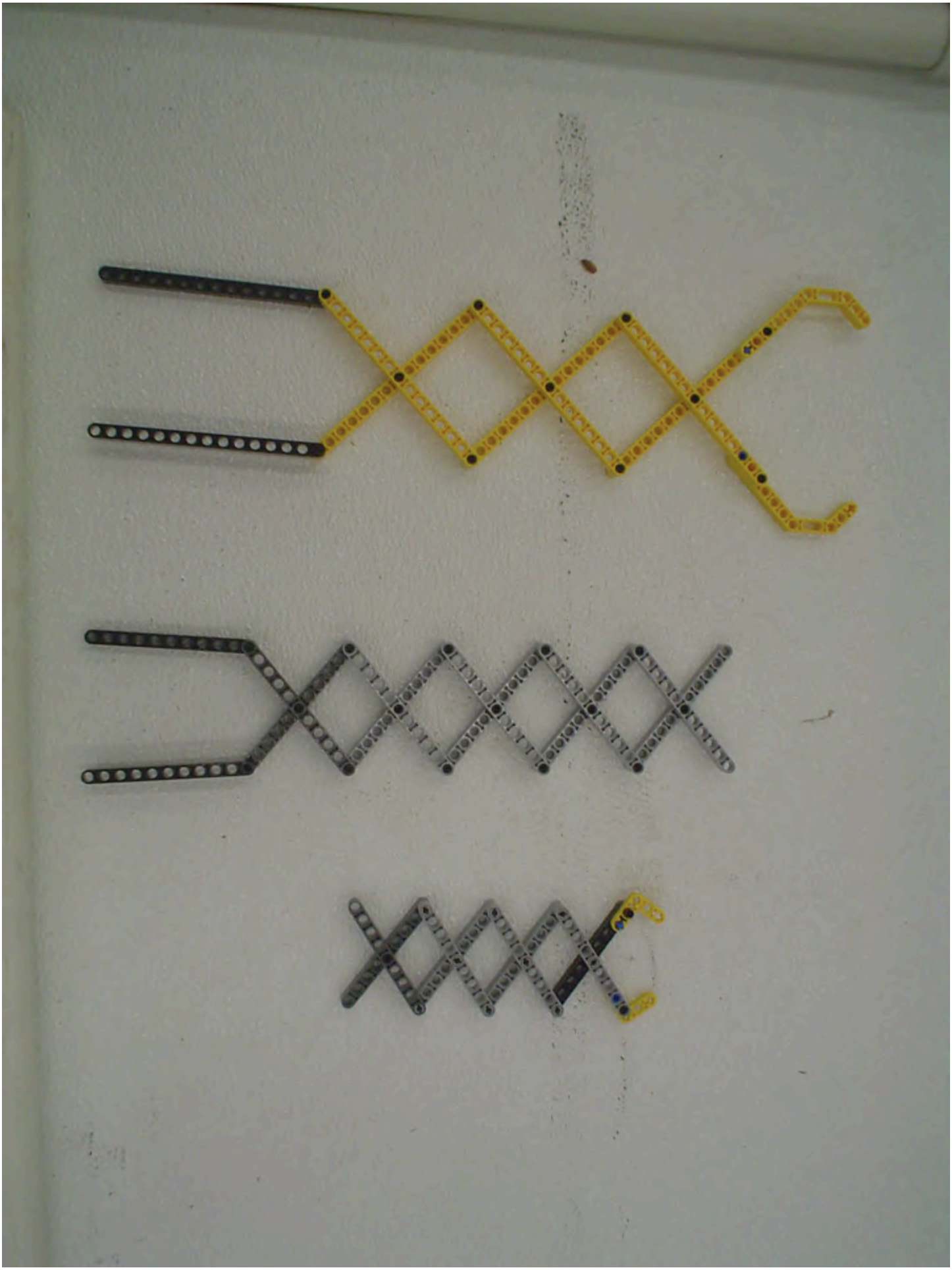
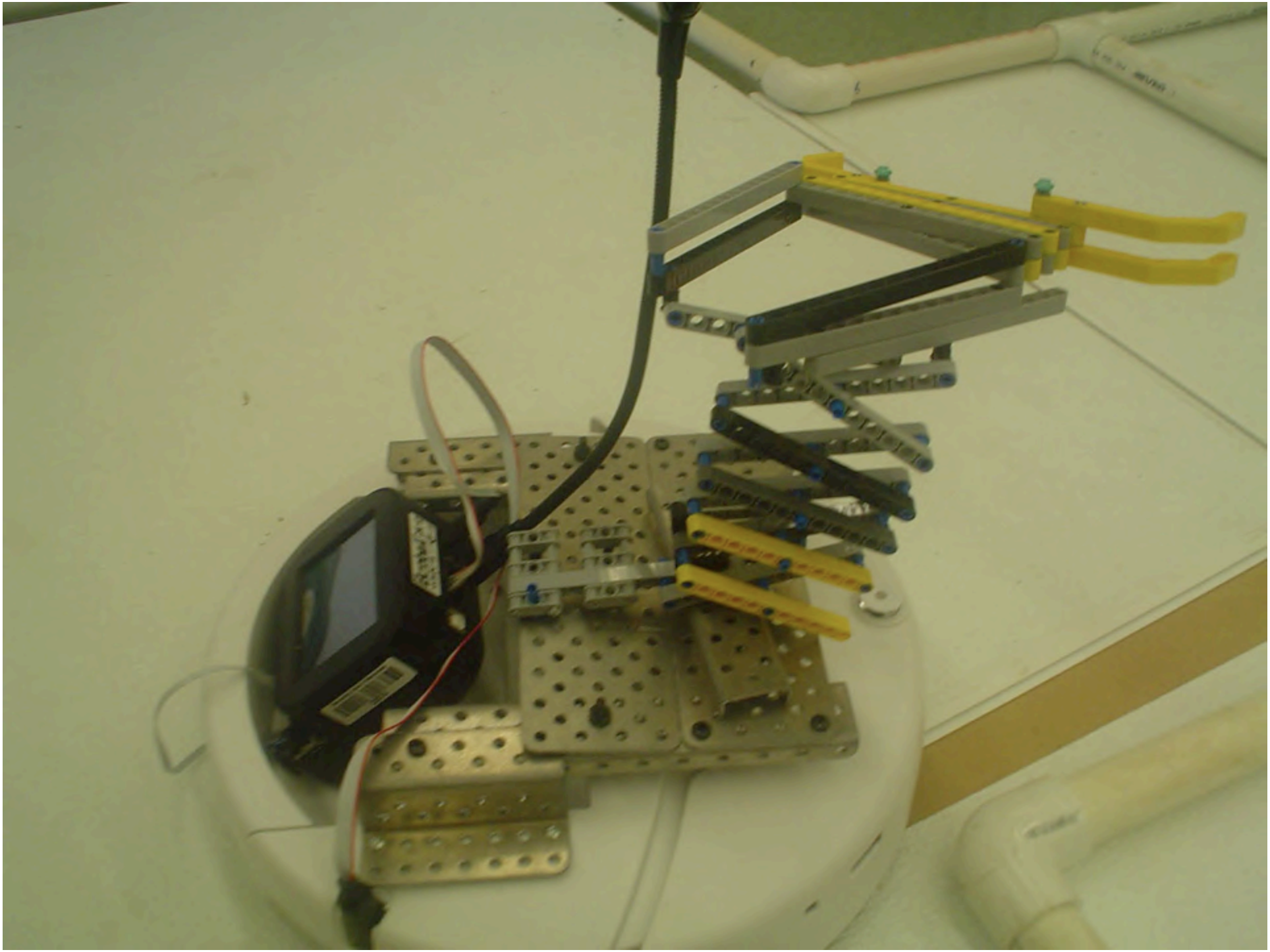
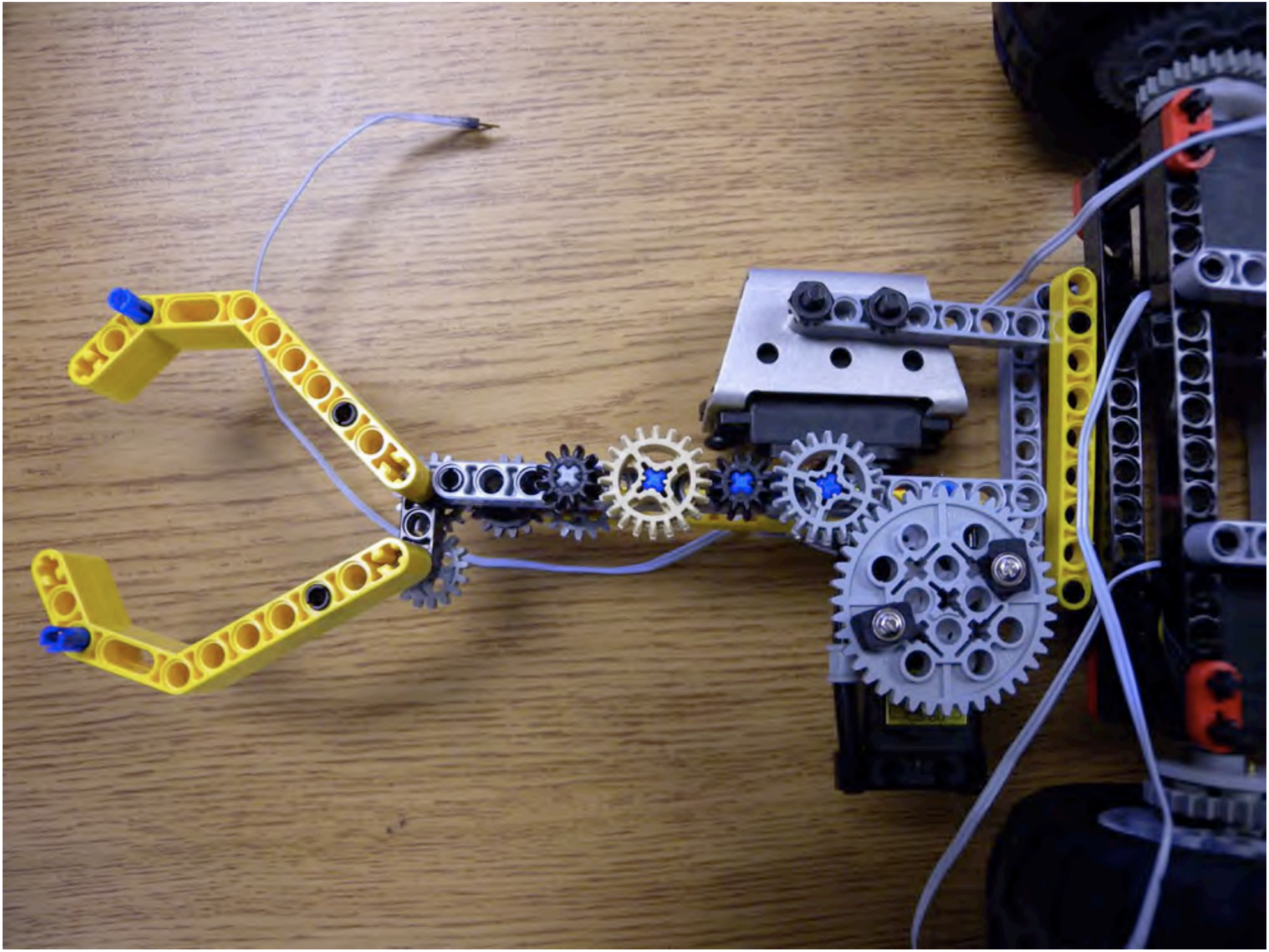
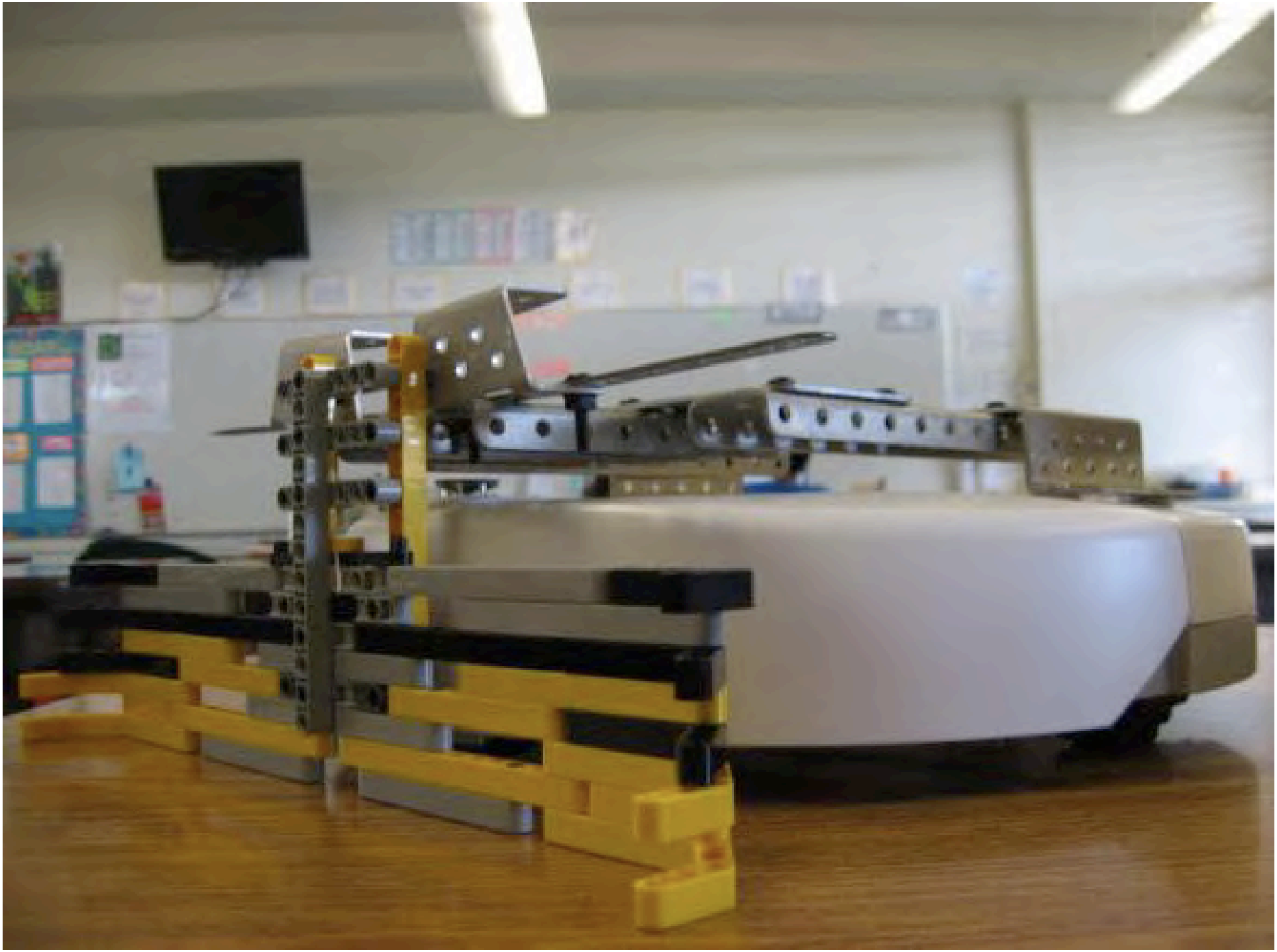
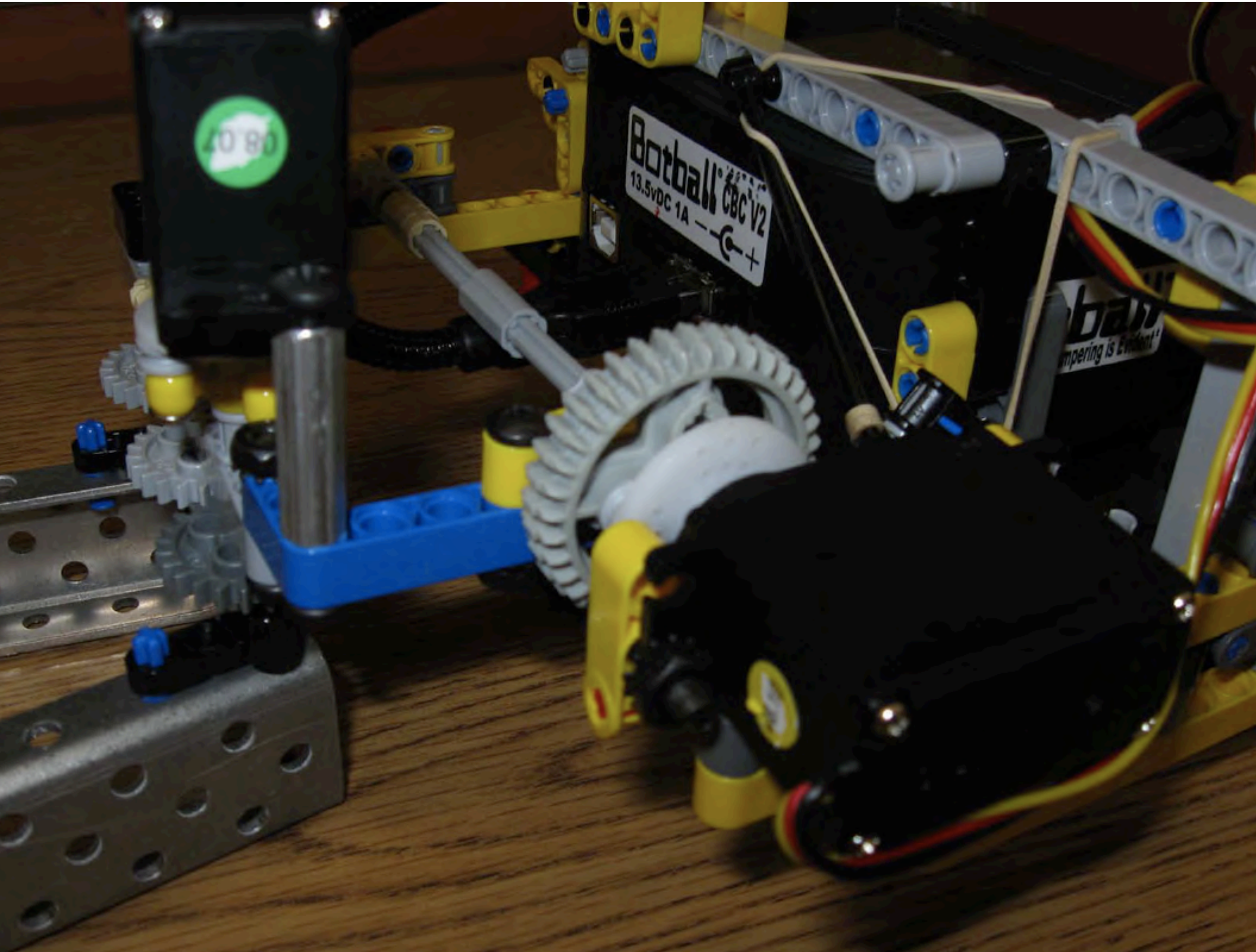


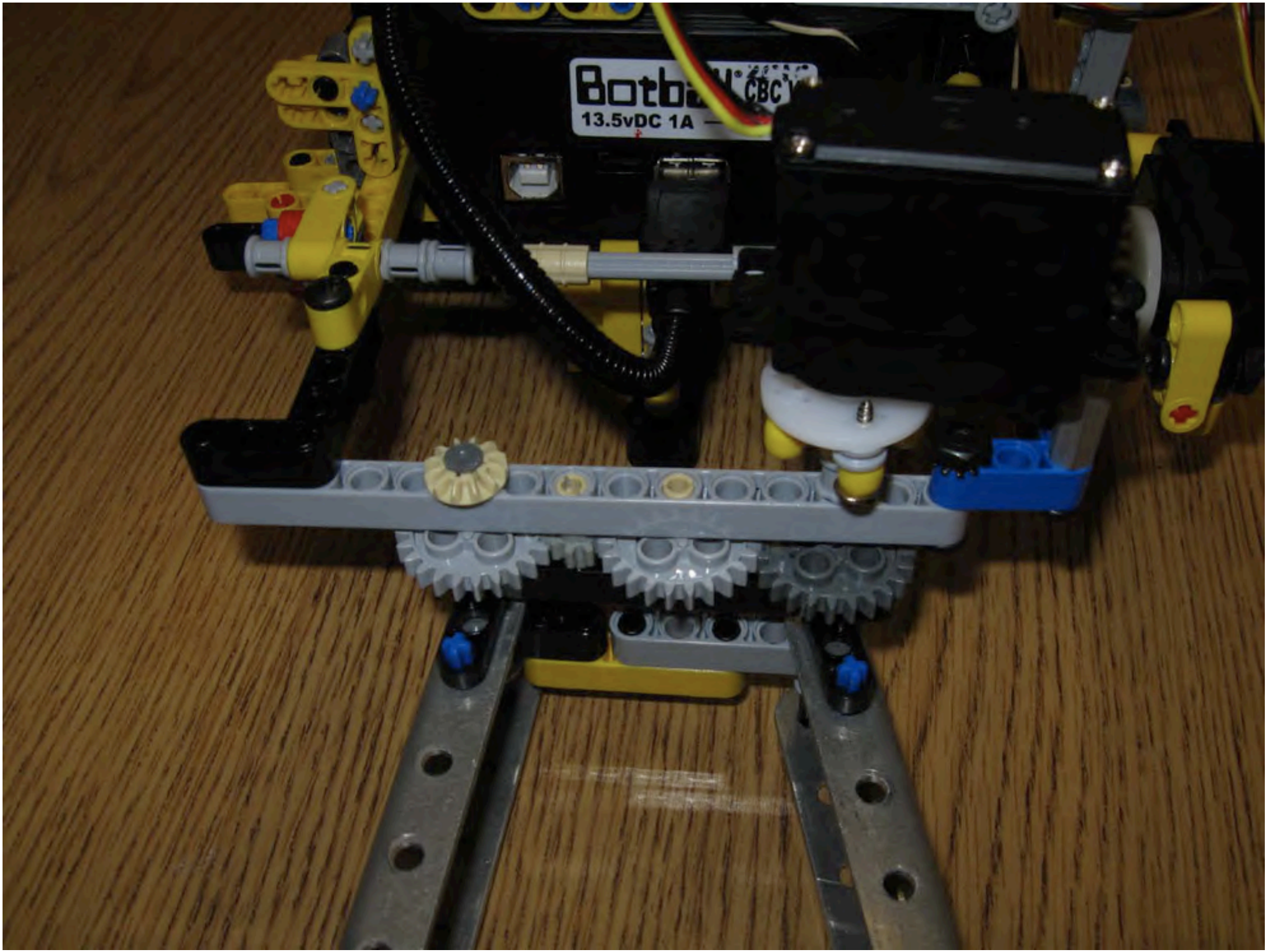









Botball CBC V2
13.5vDC 1A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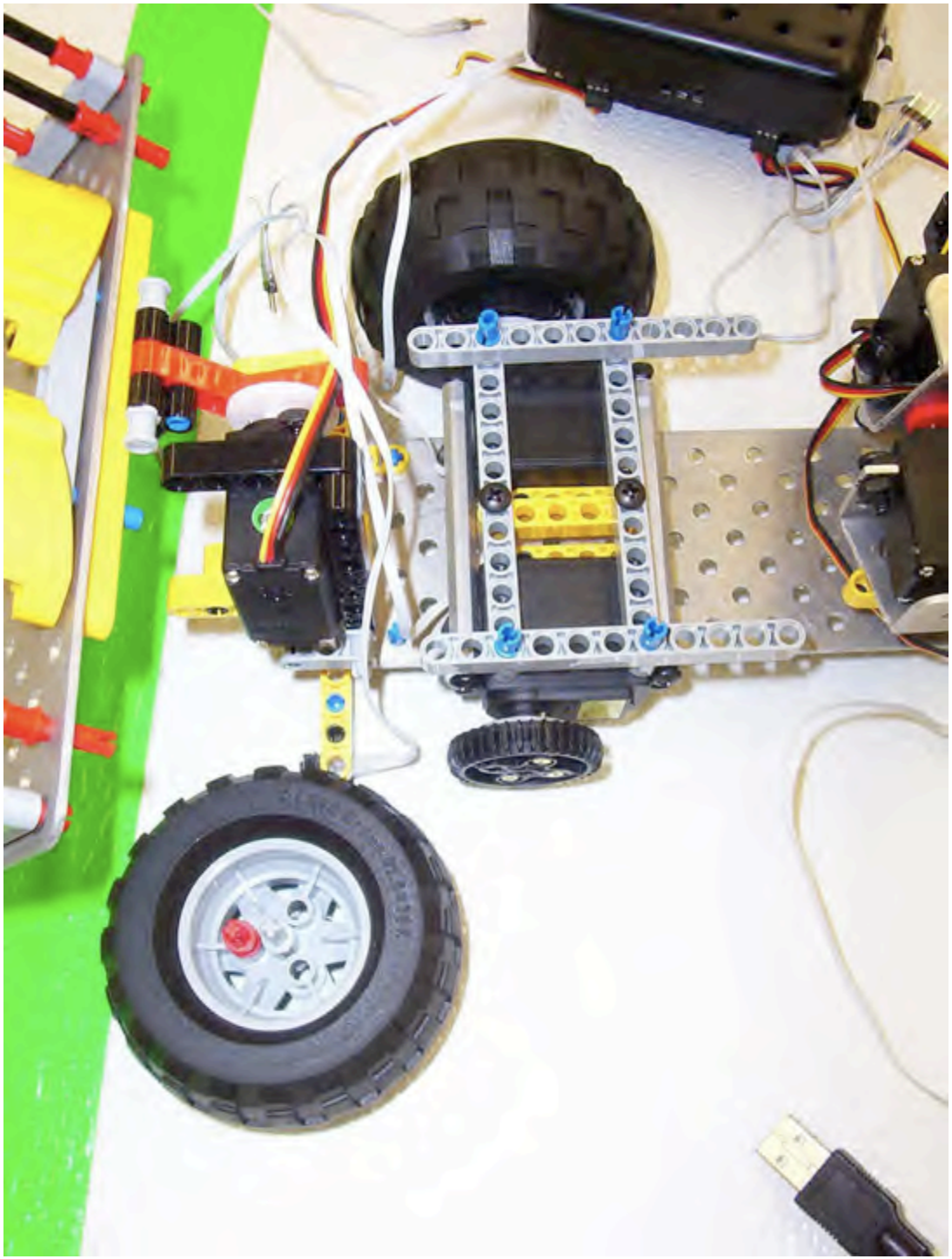
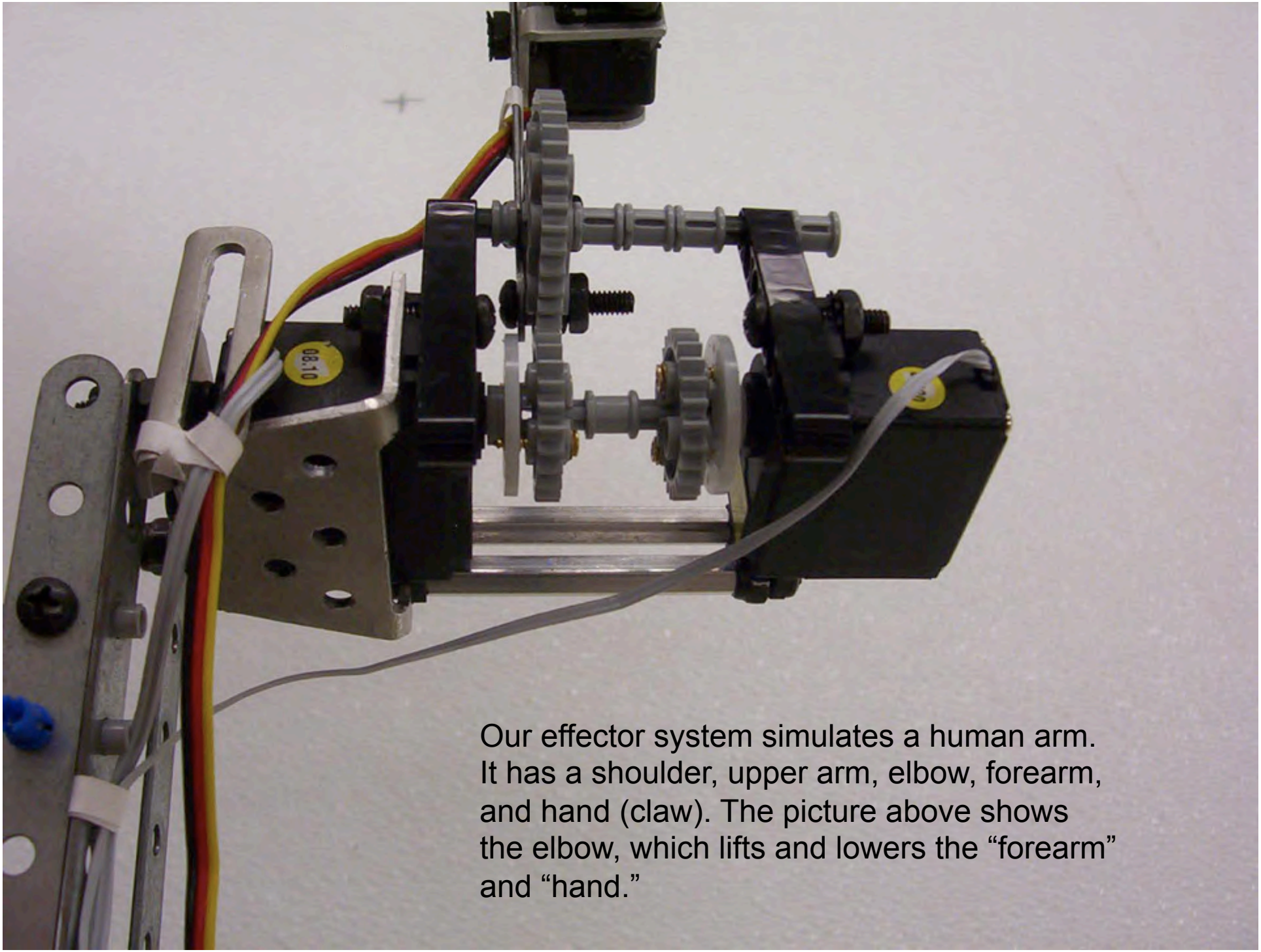
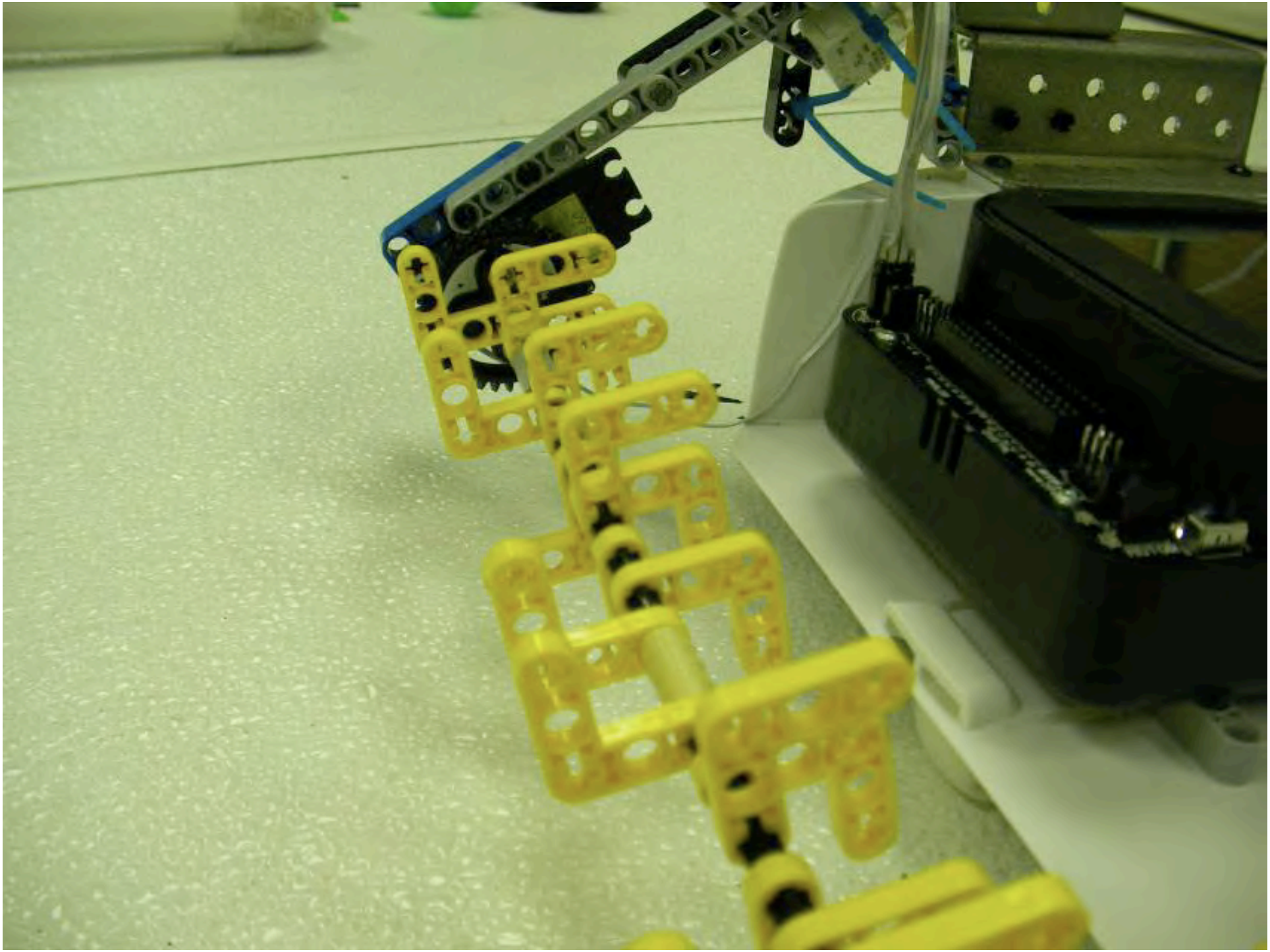
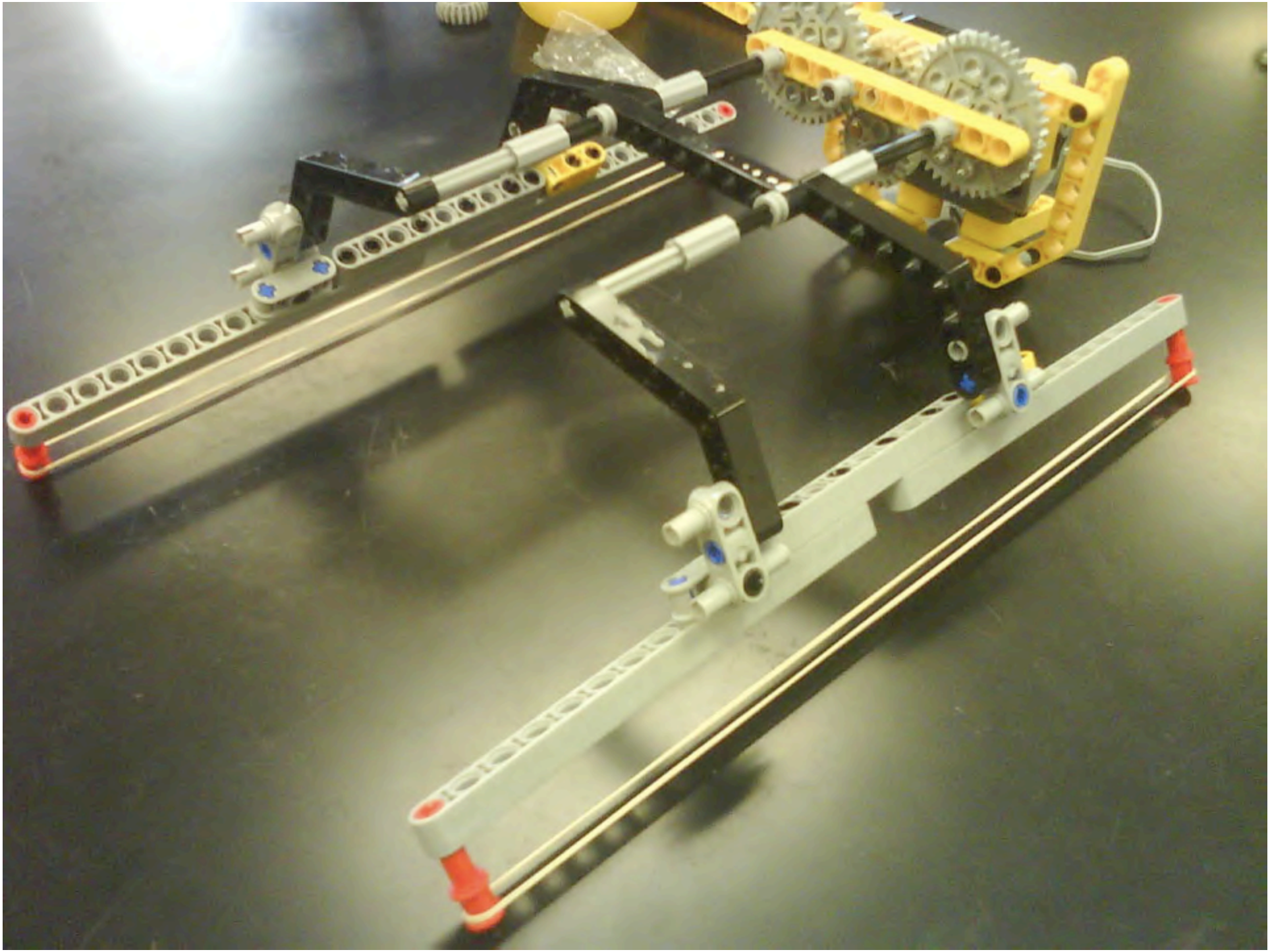
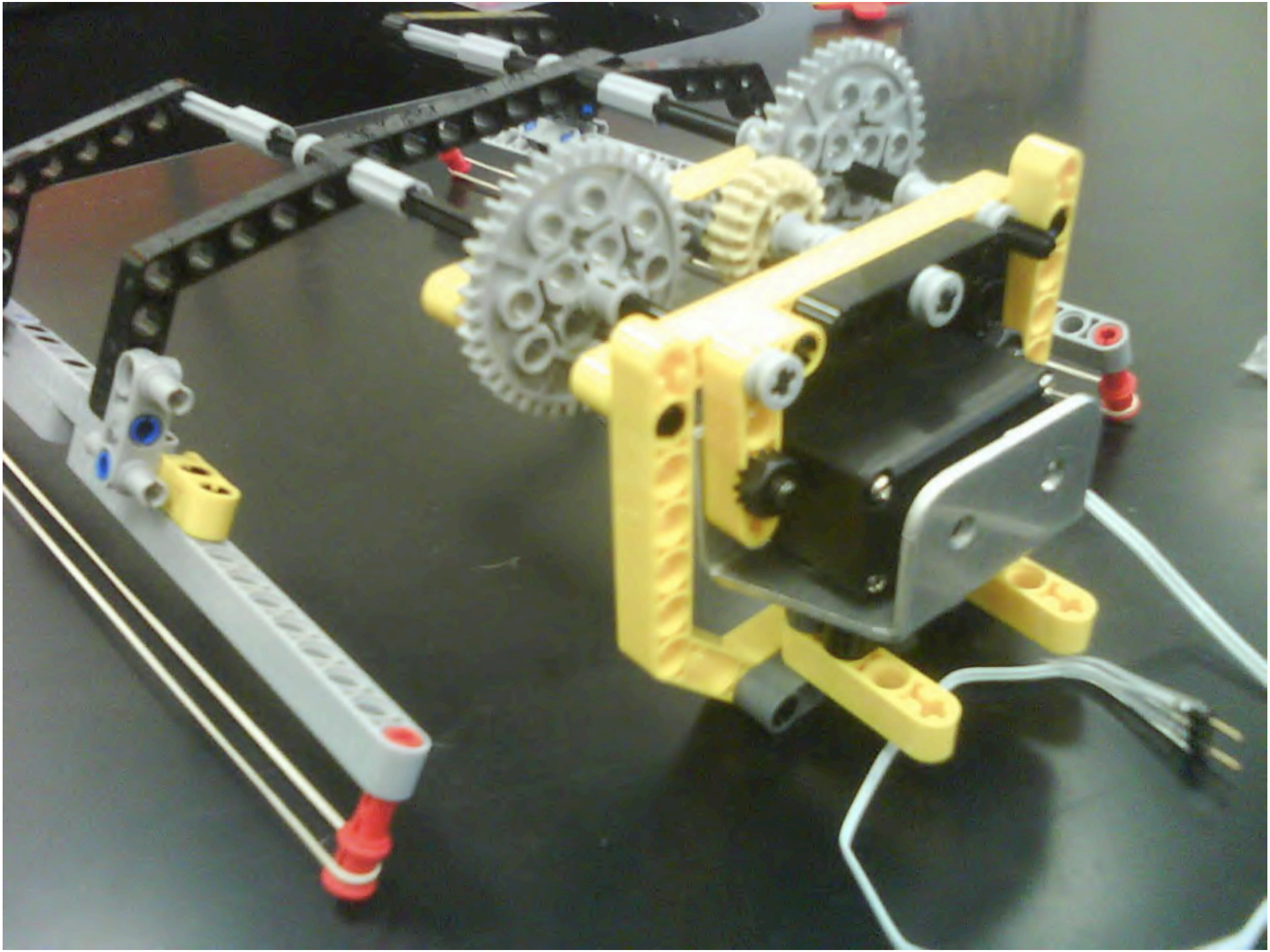


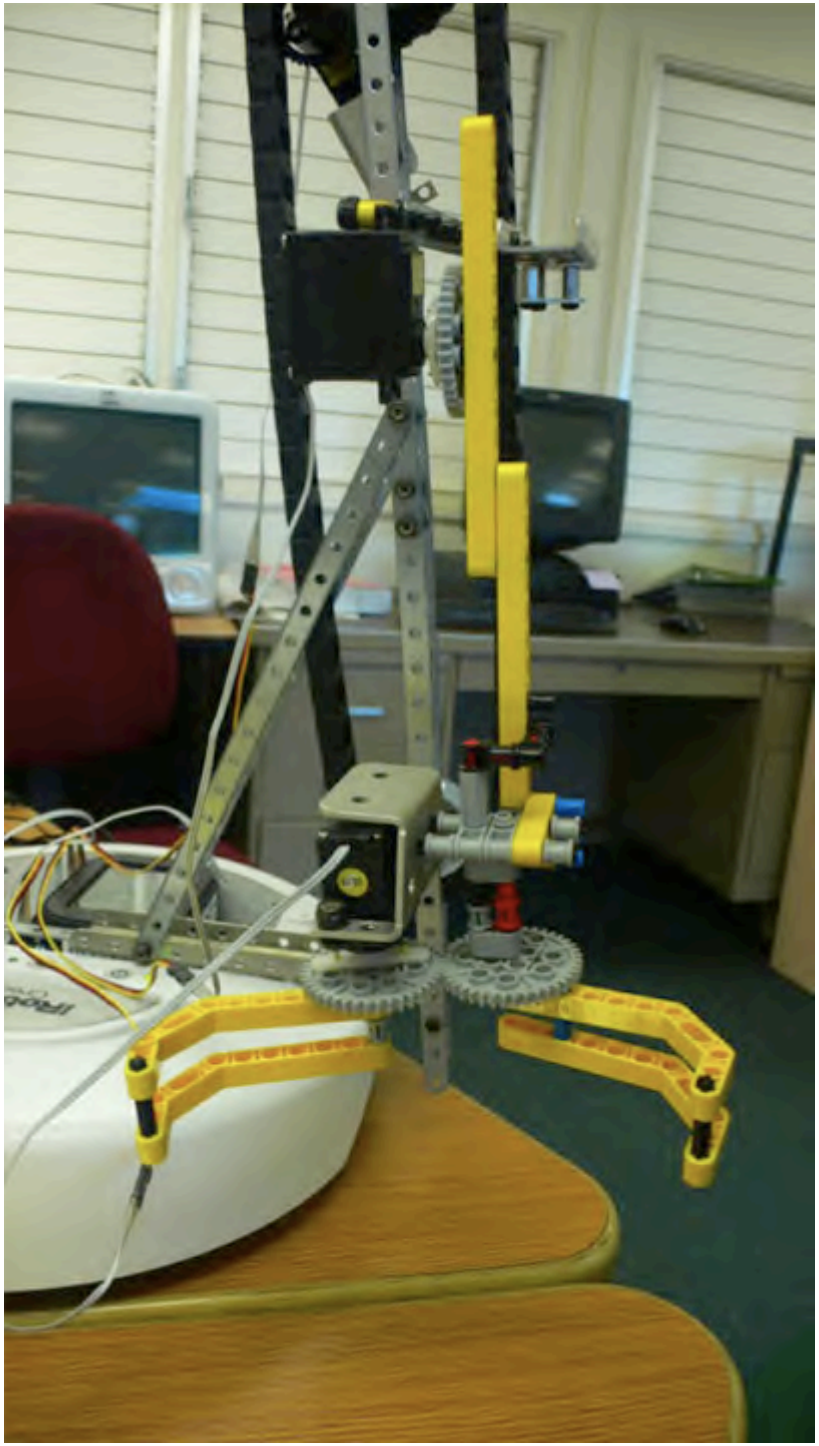


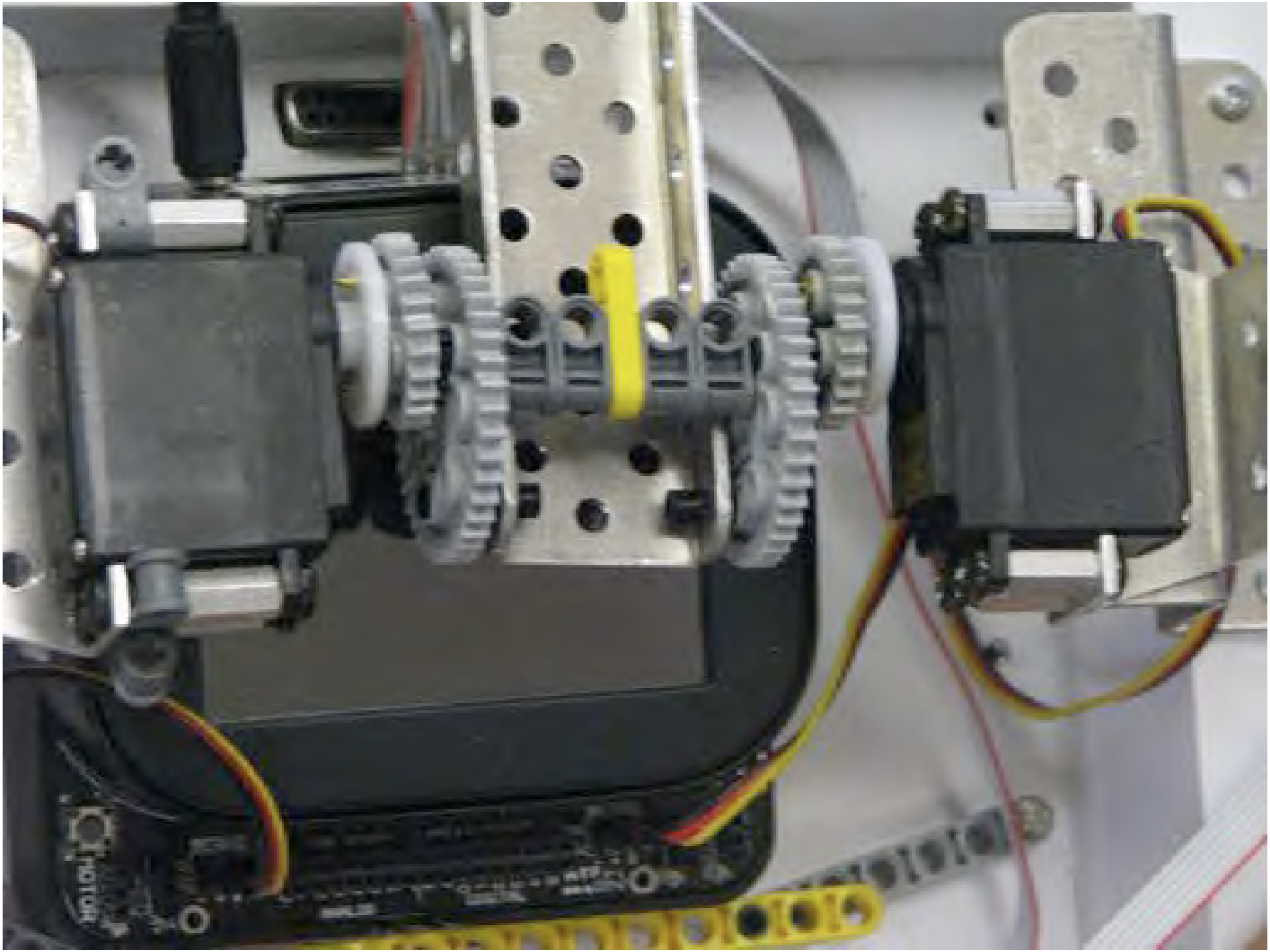
Our effector system simulates a human arm. It has a shoulder, upper arm, elbow, forearm, and hand (claw). The picture above shows the elbow, which lifts and lowers the “forearm” and “hand.”

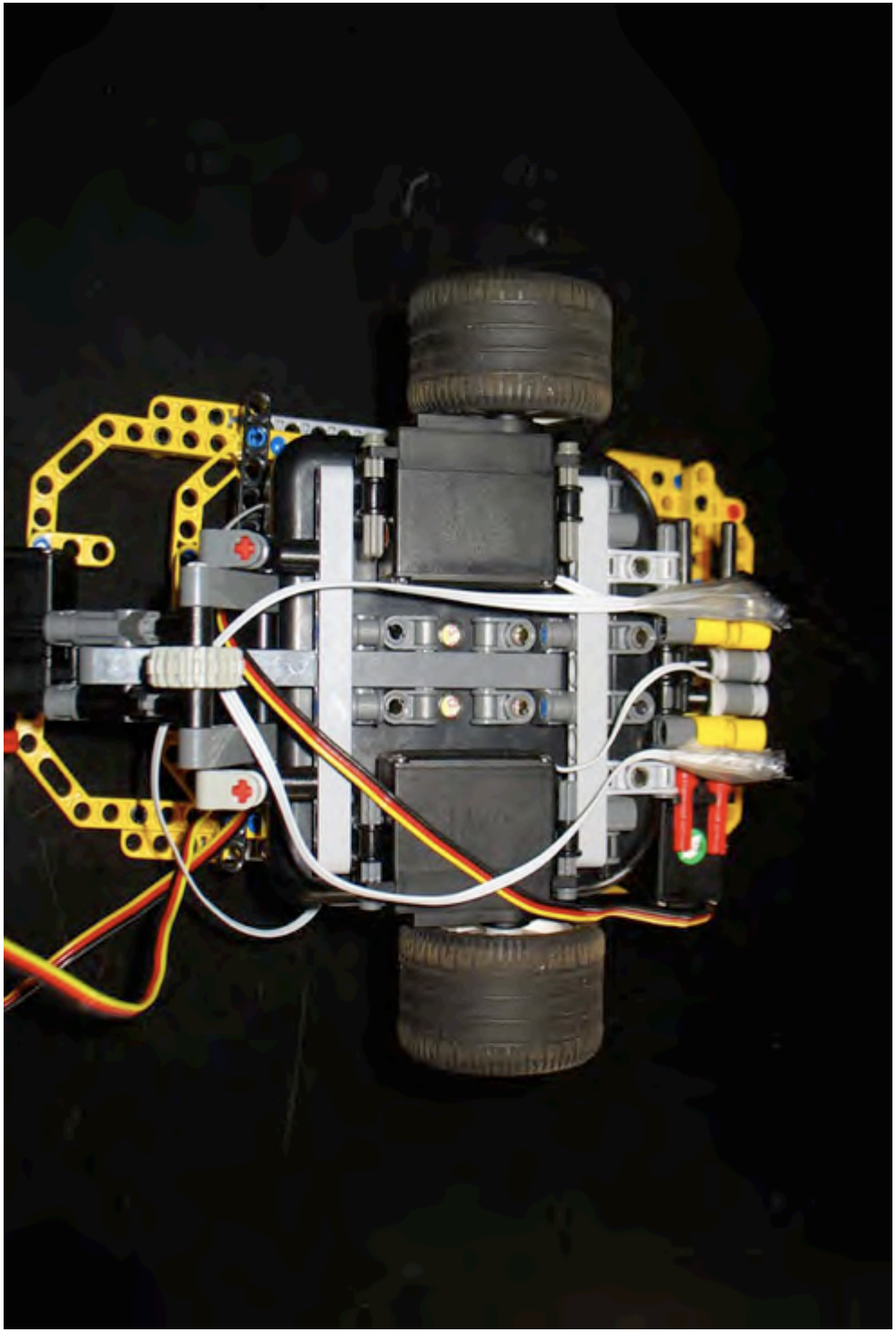


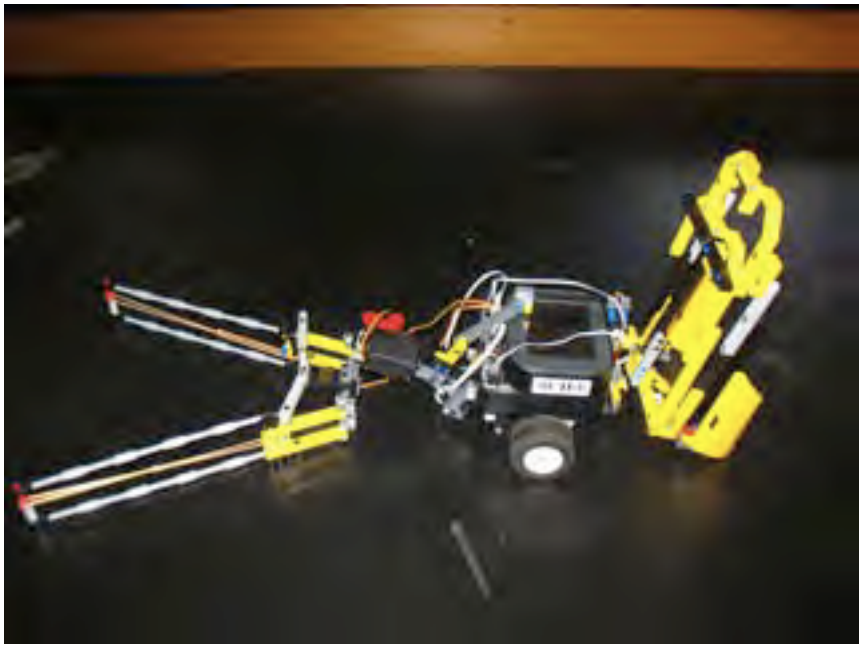


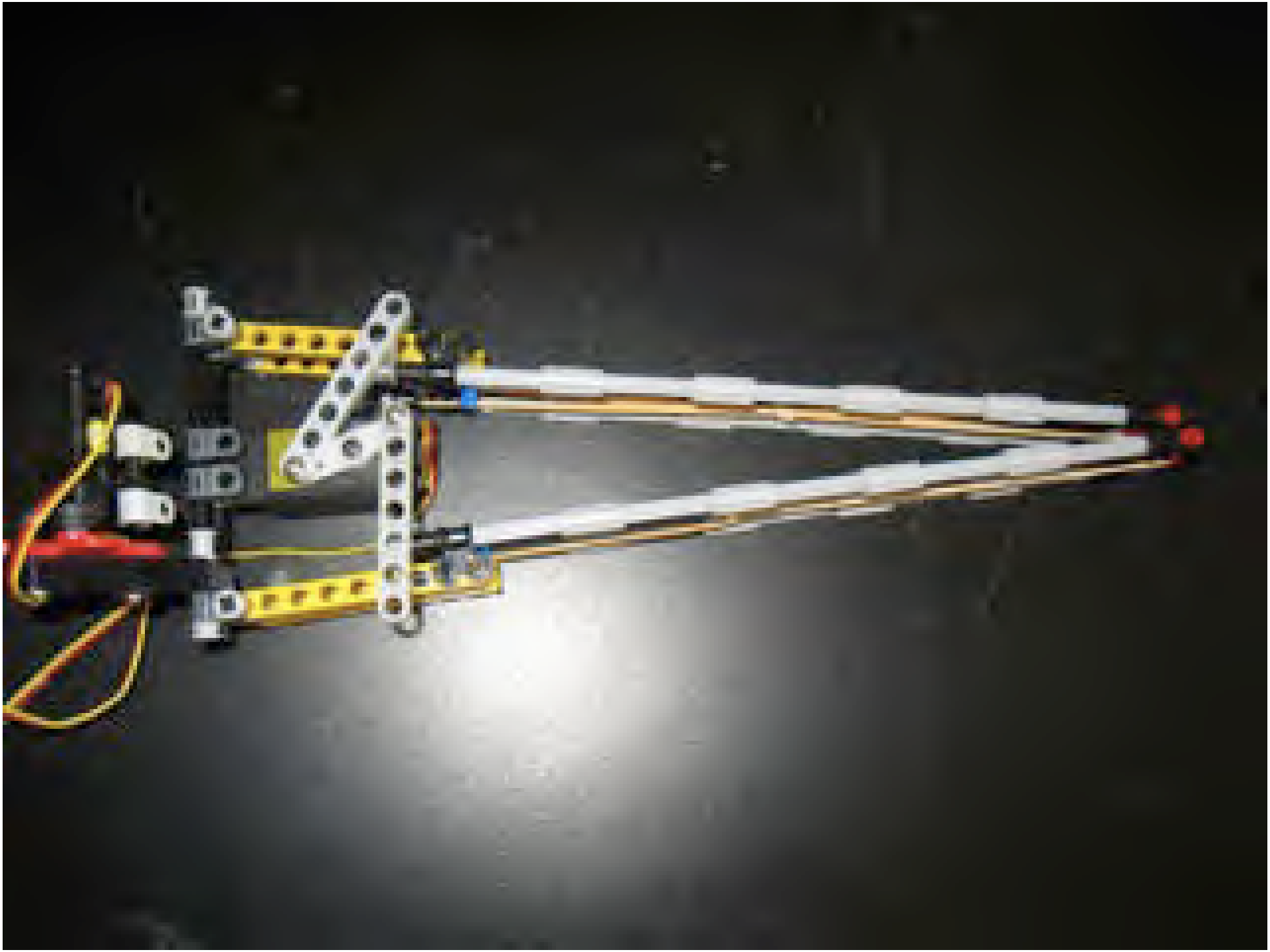


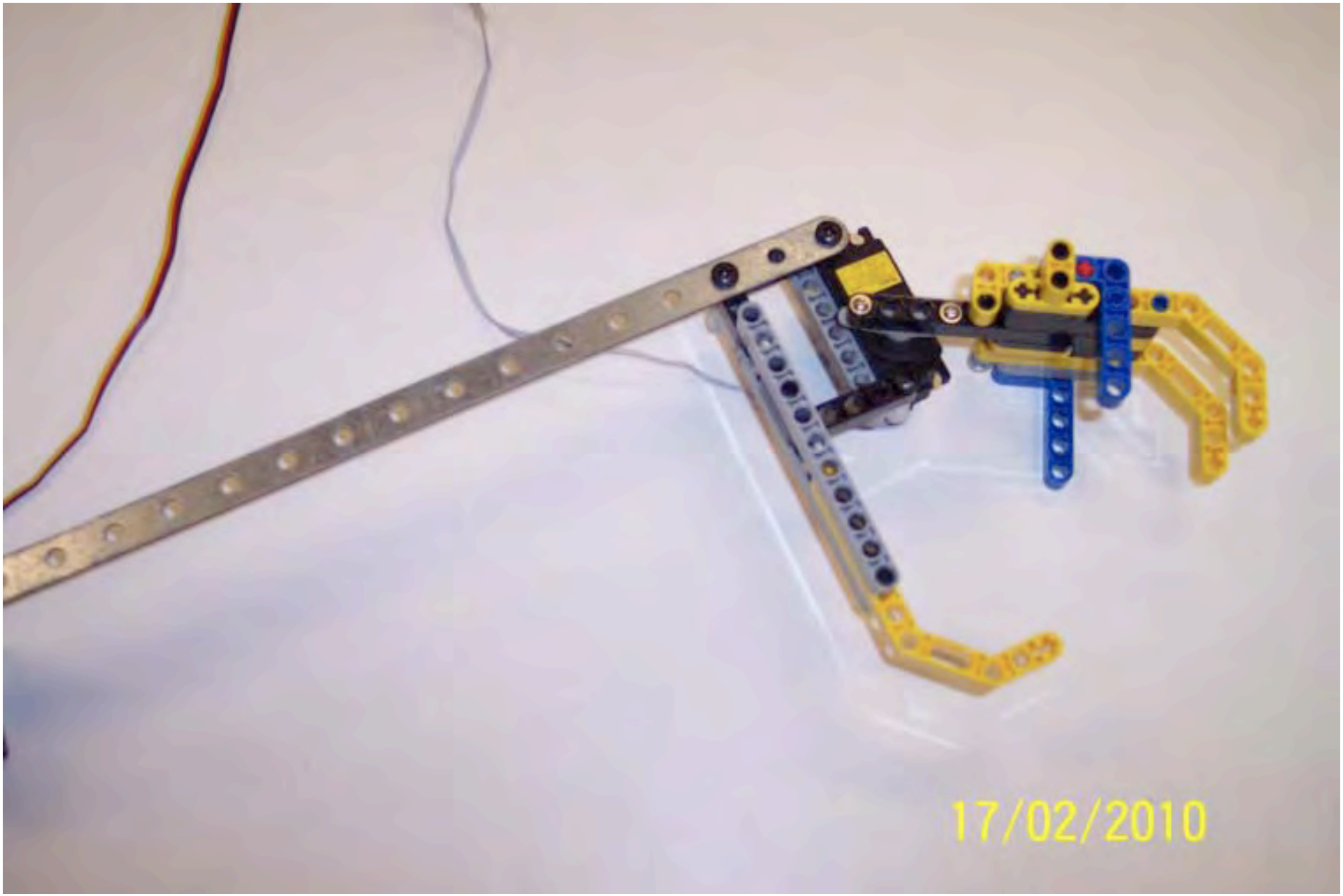


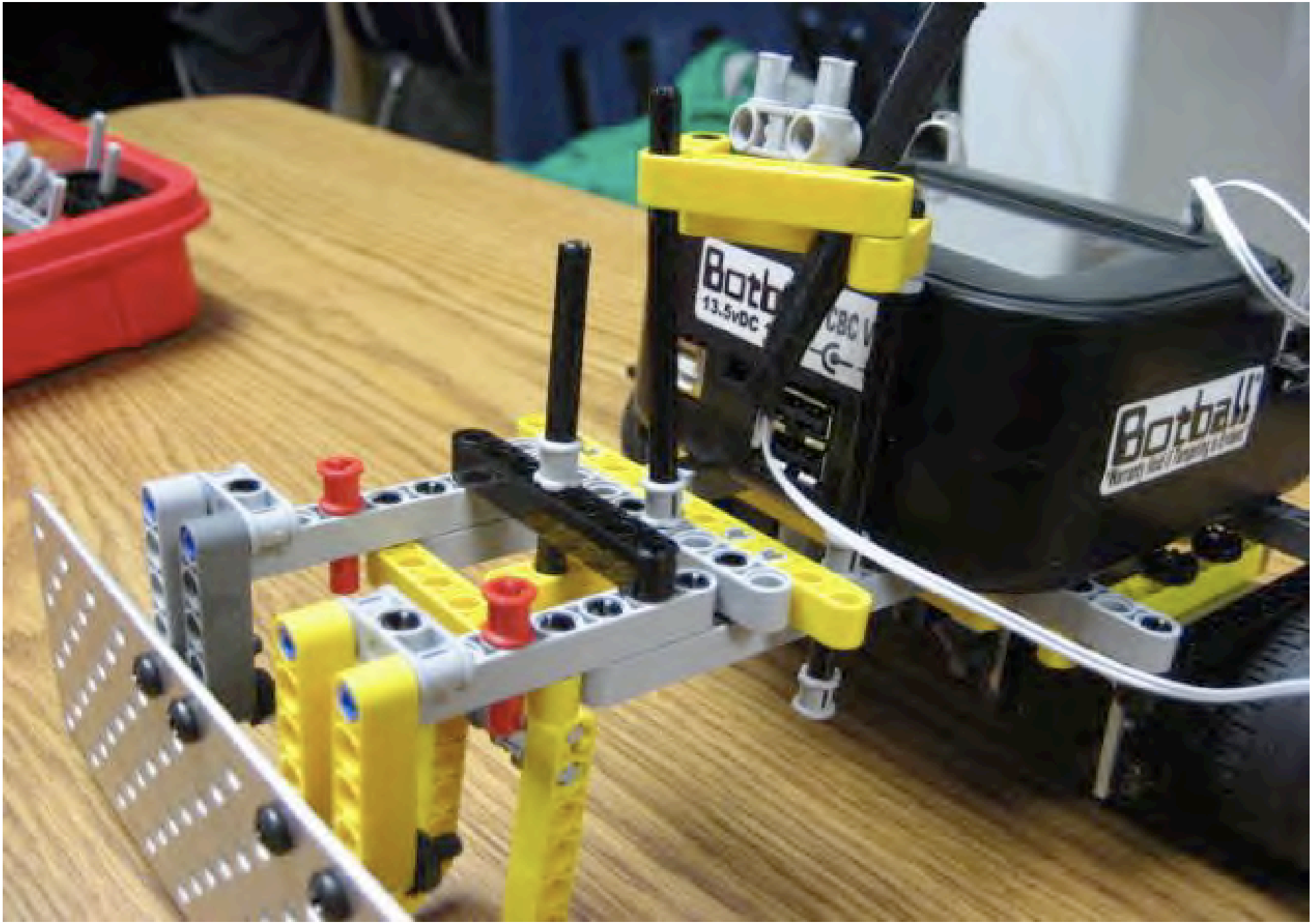


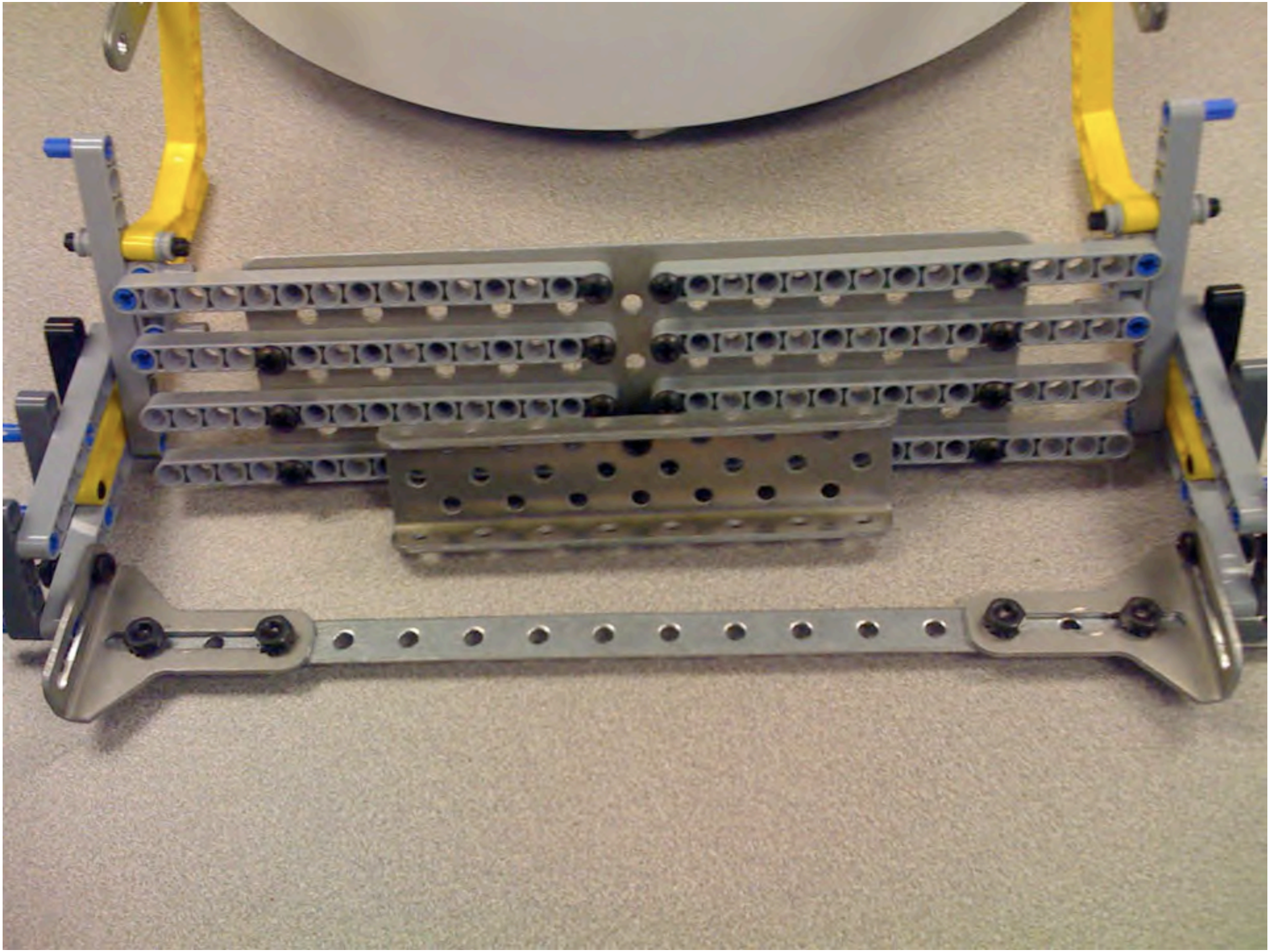


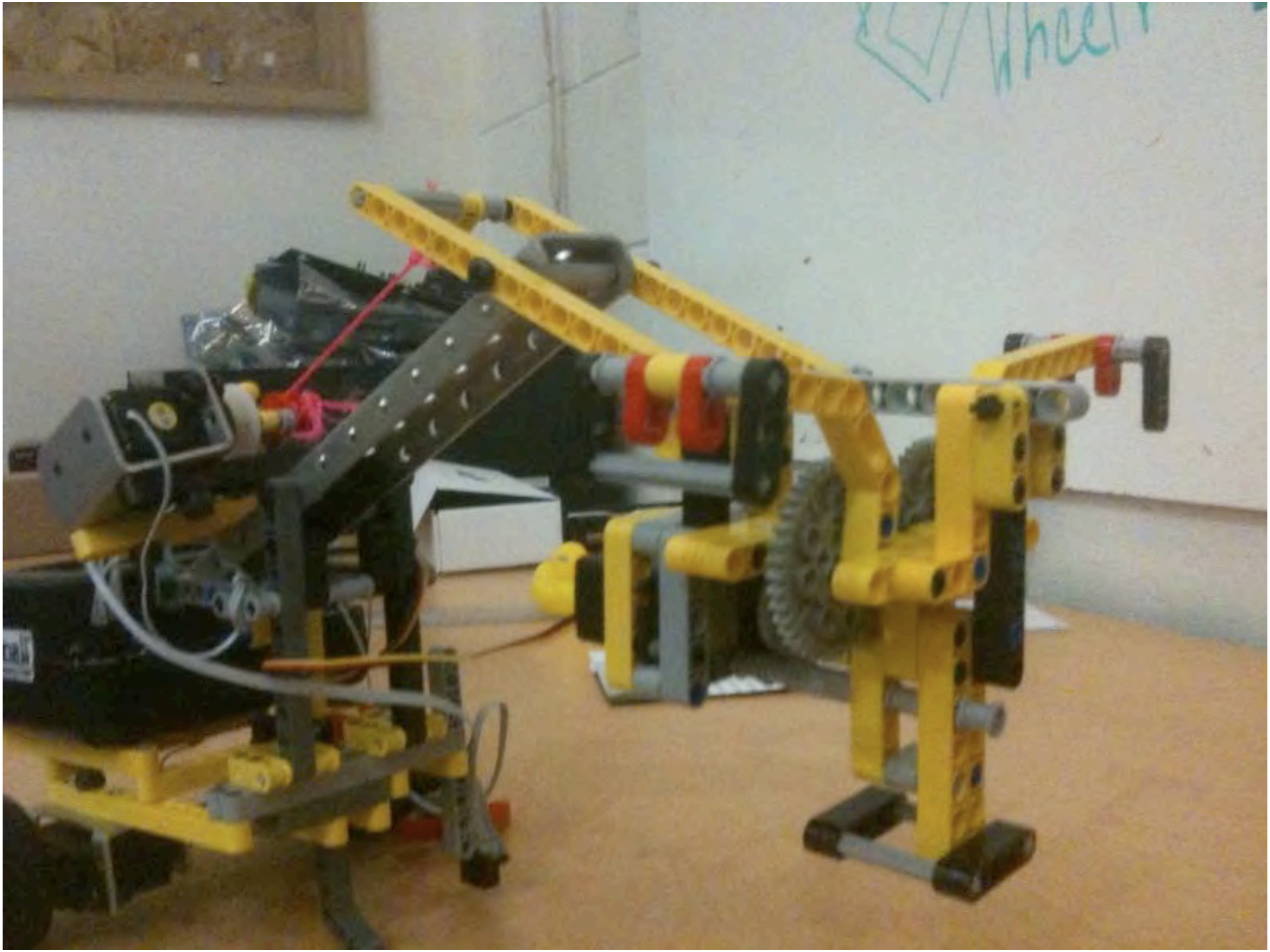


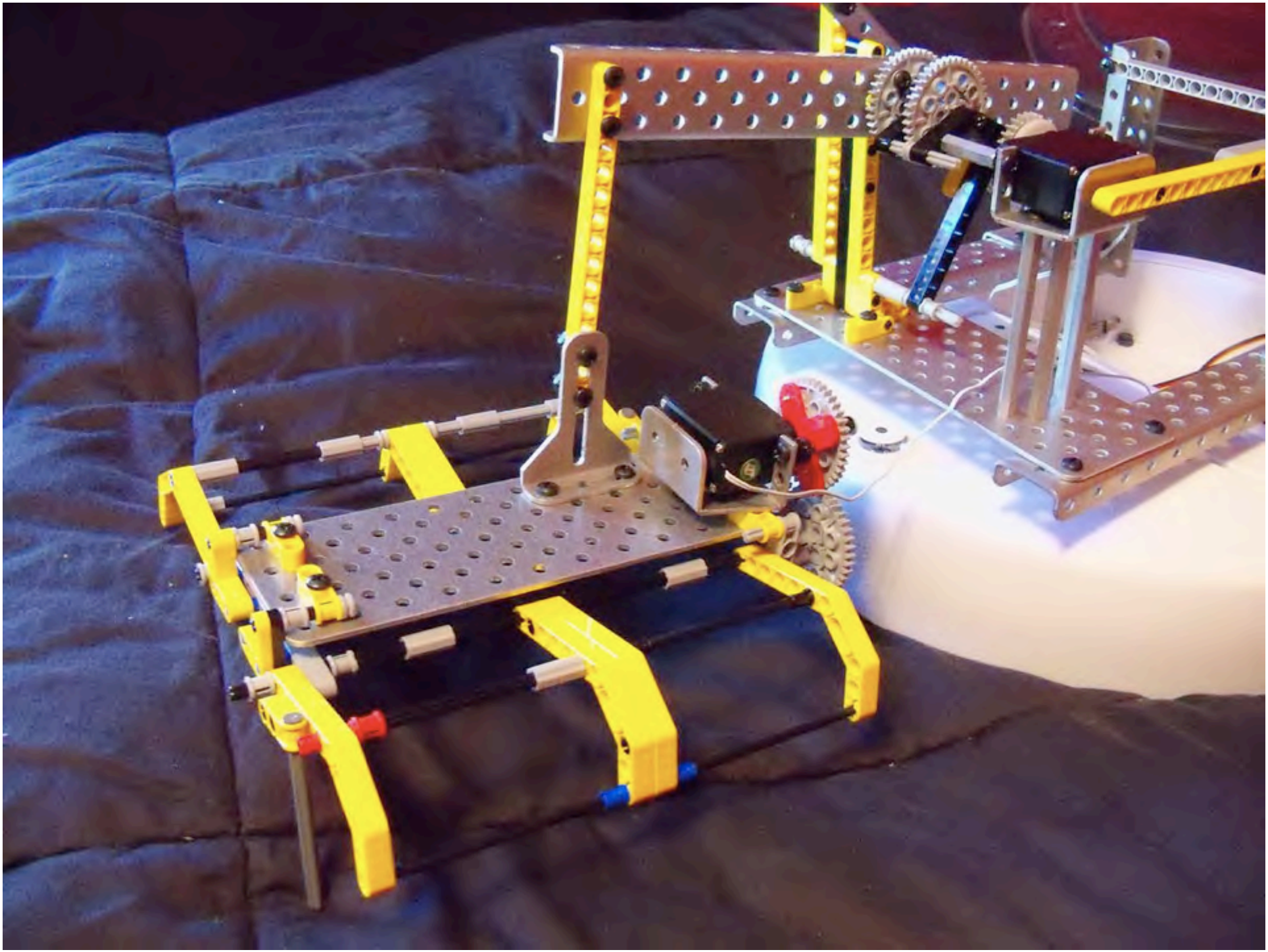


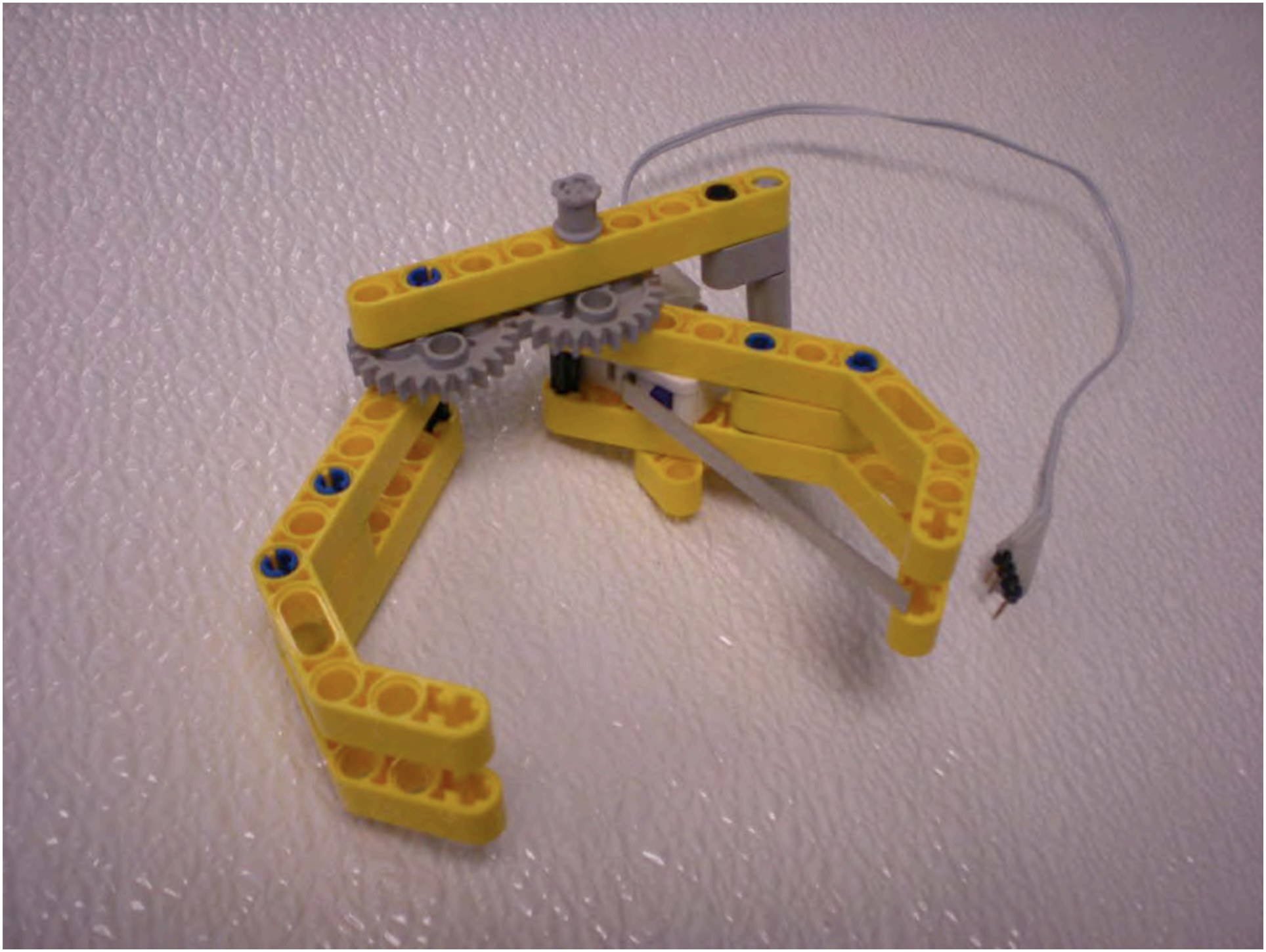

17/02/2010

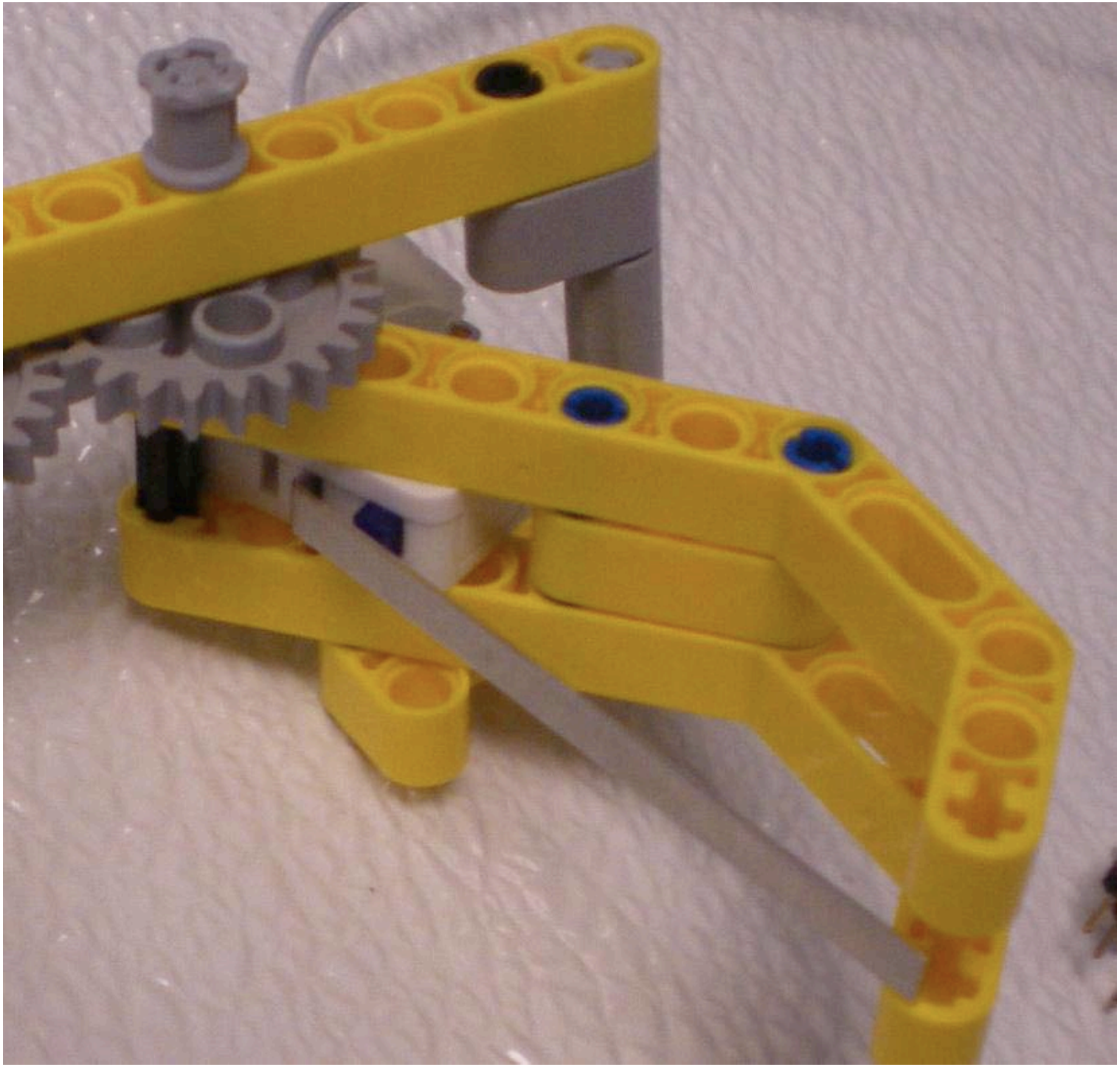

Botb
13.5vDC
Botball

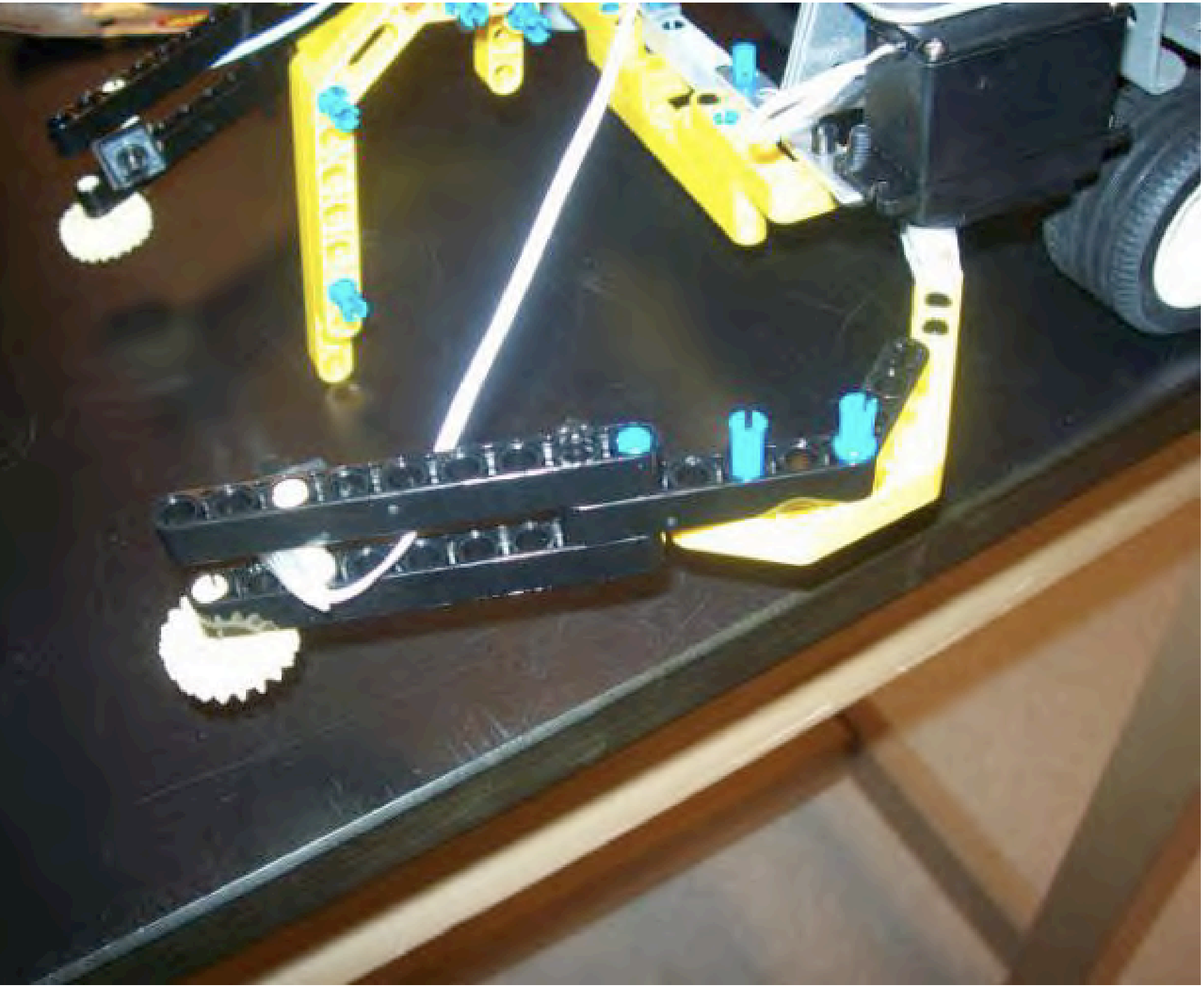


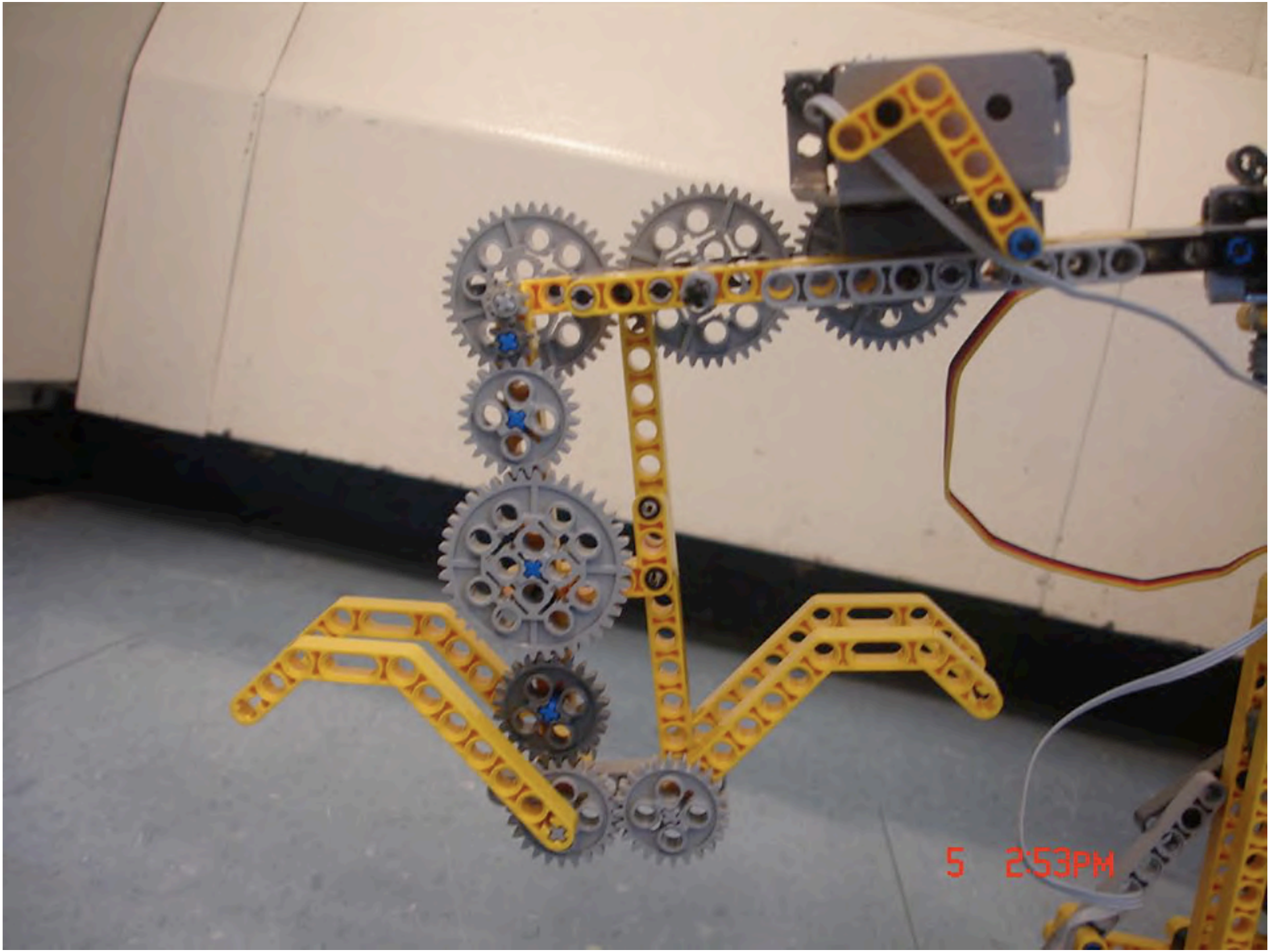


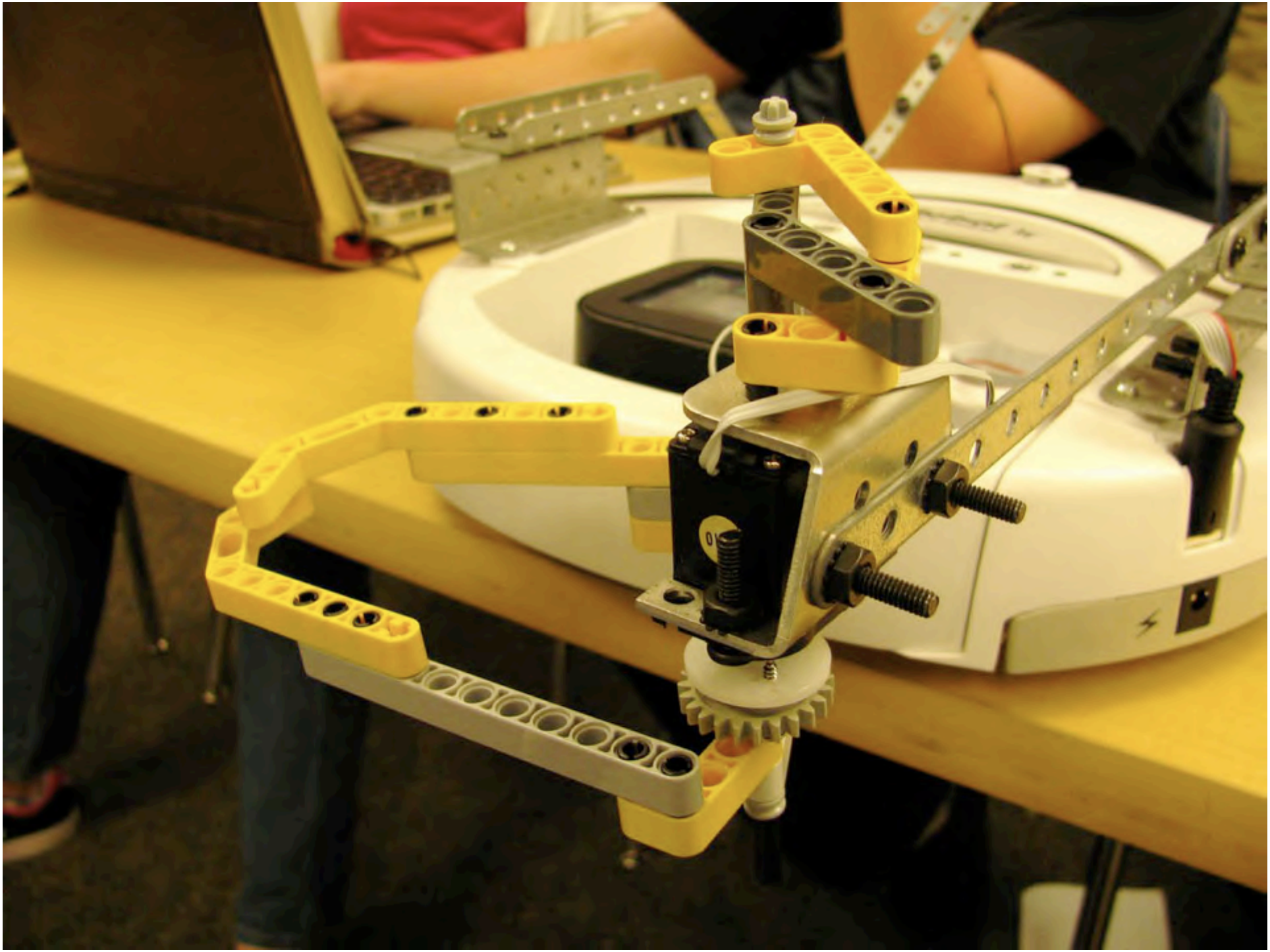









5 2:53PM



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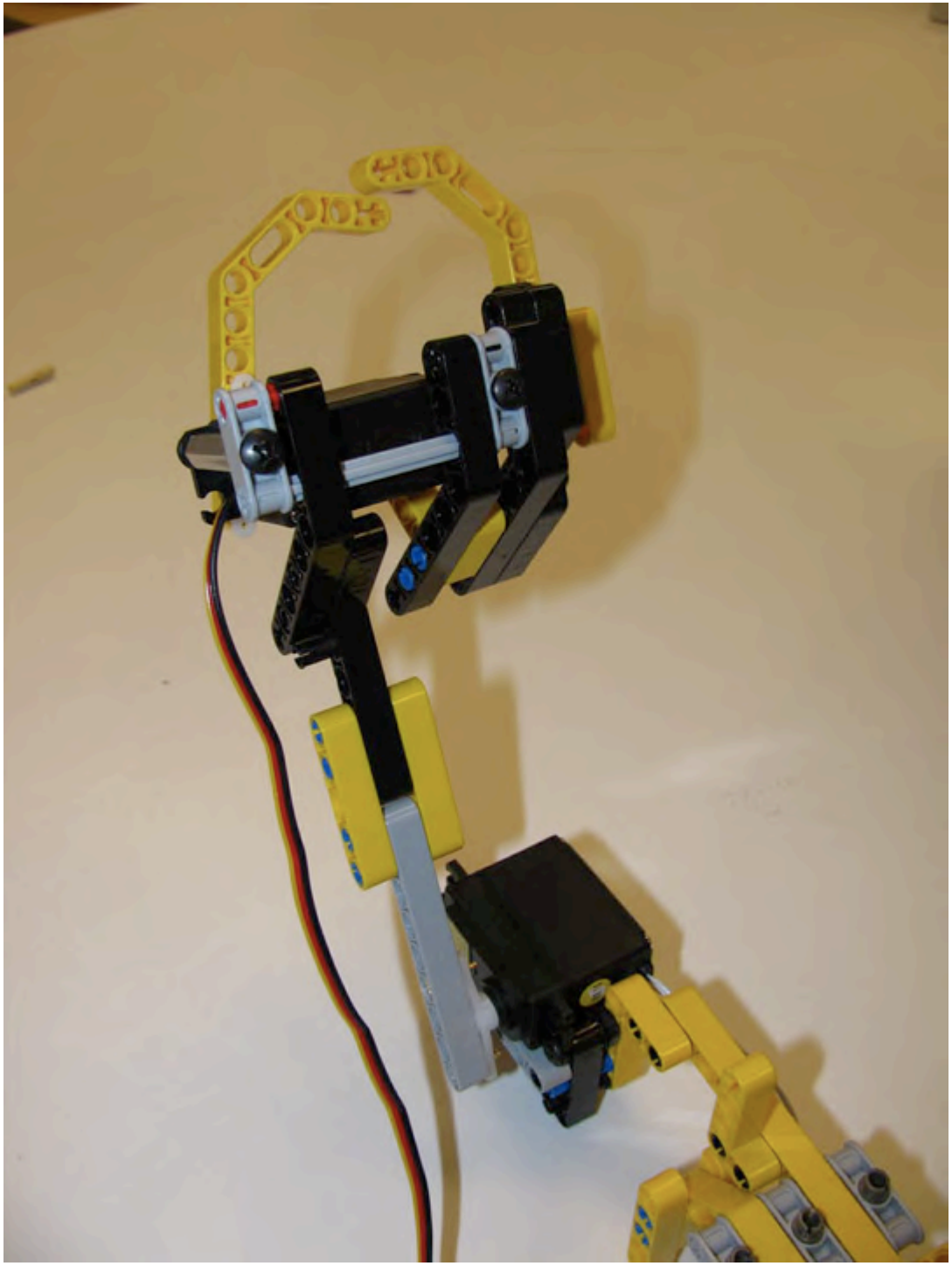

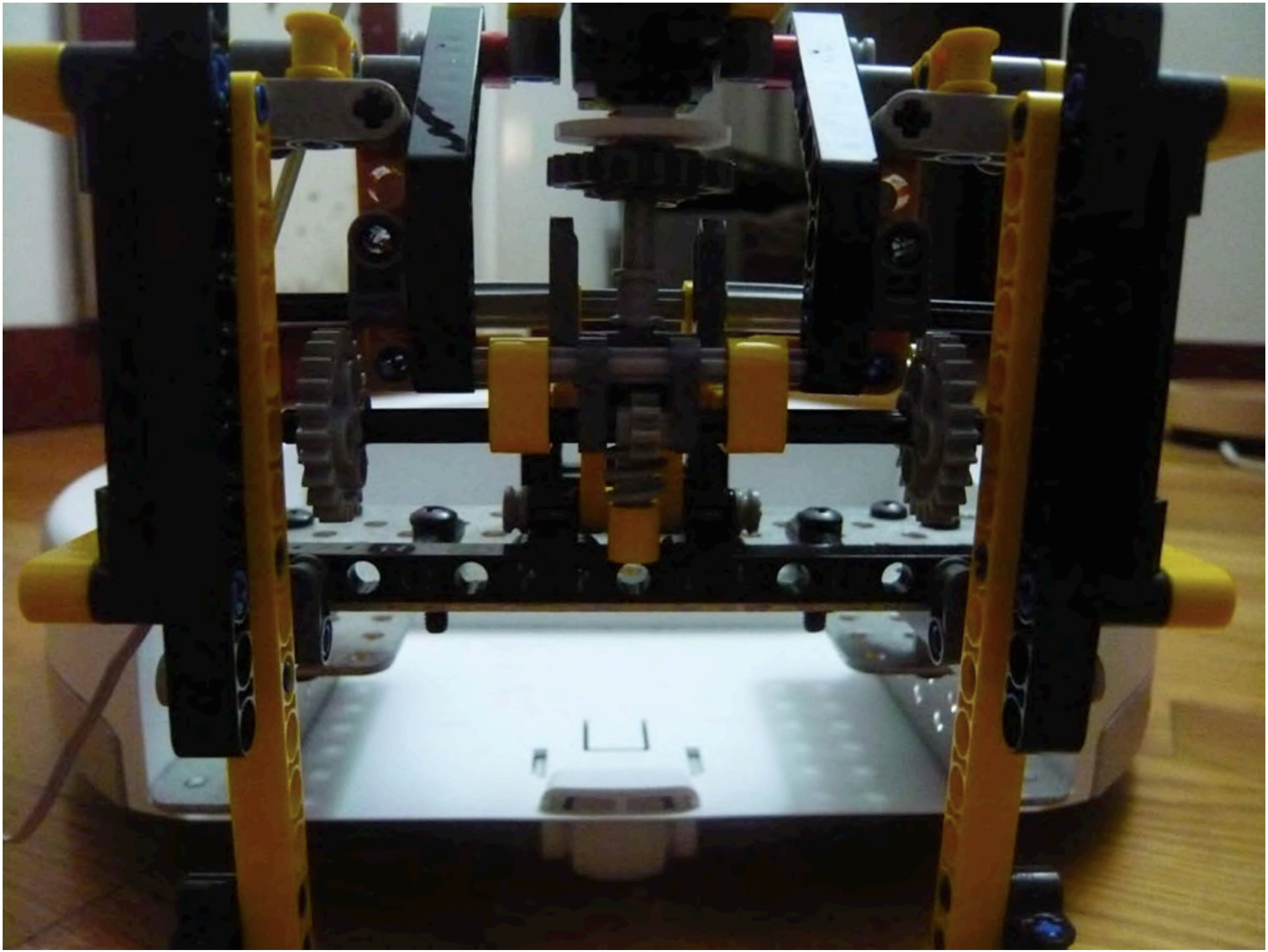

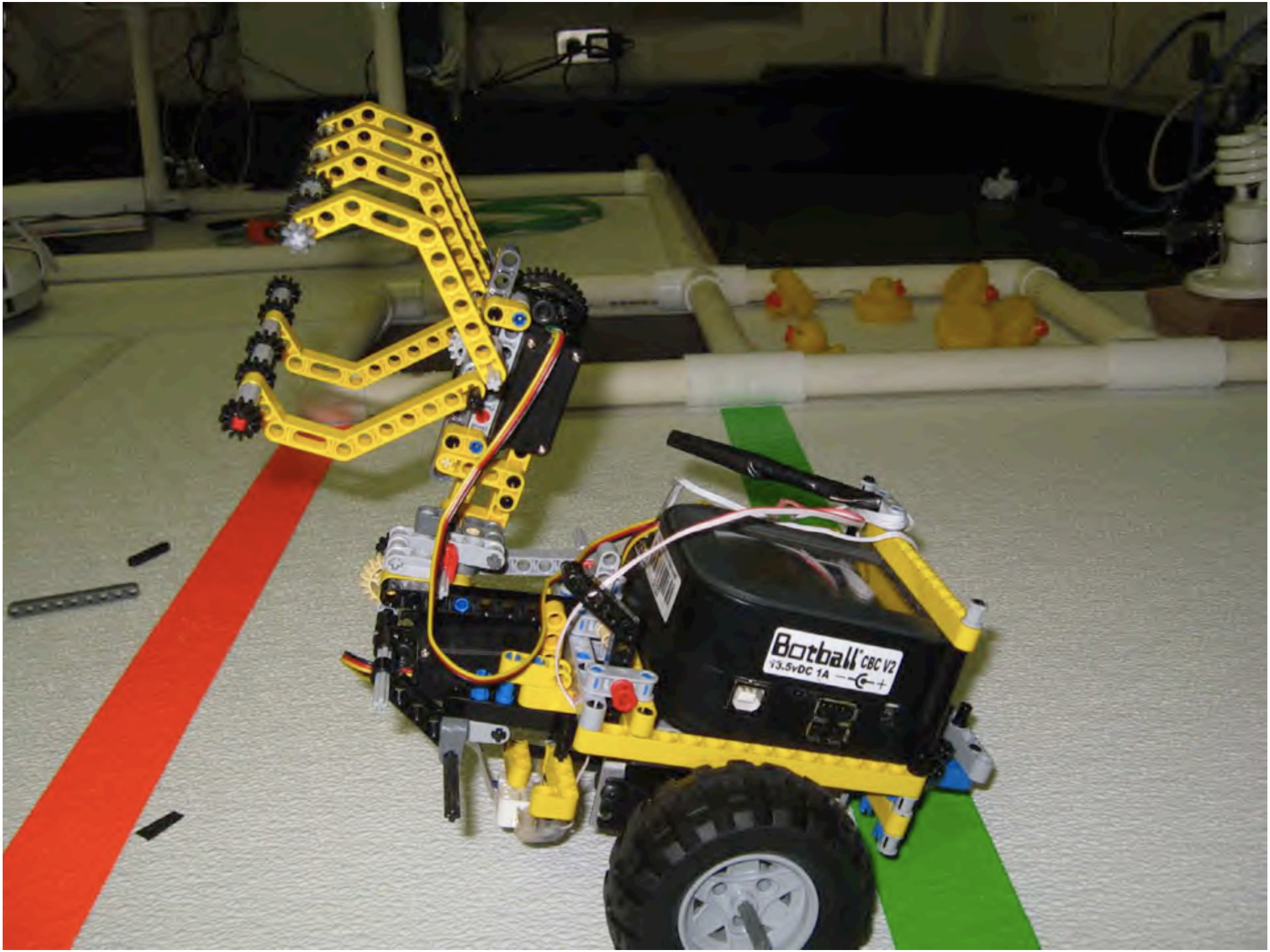
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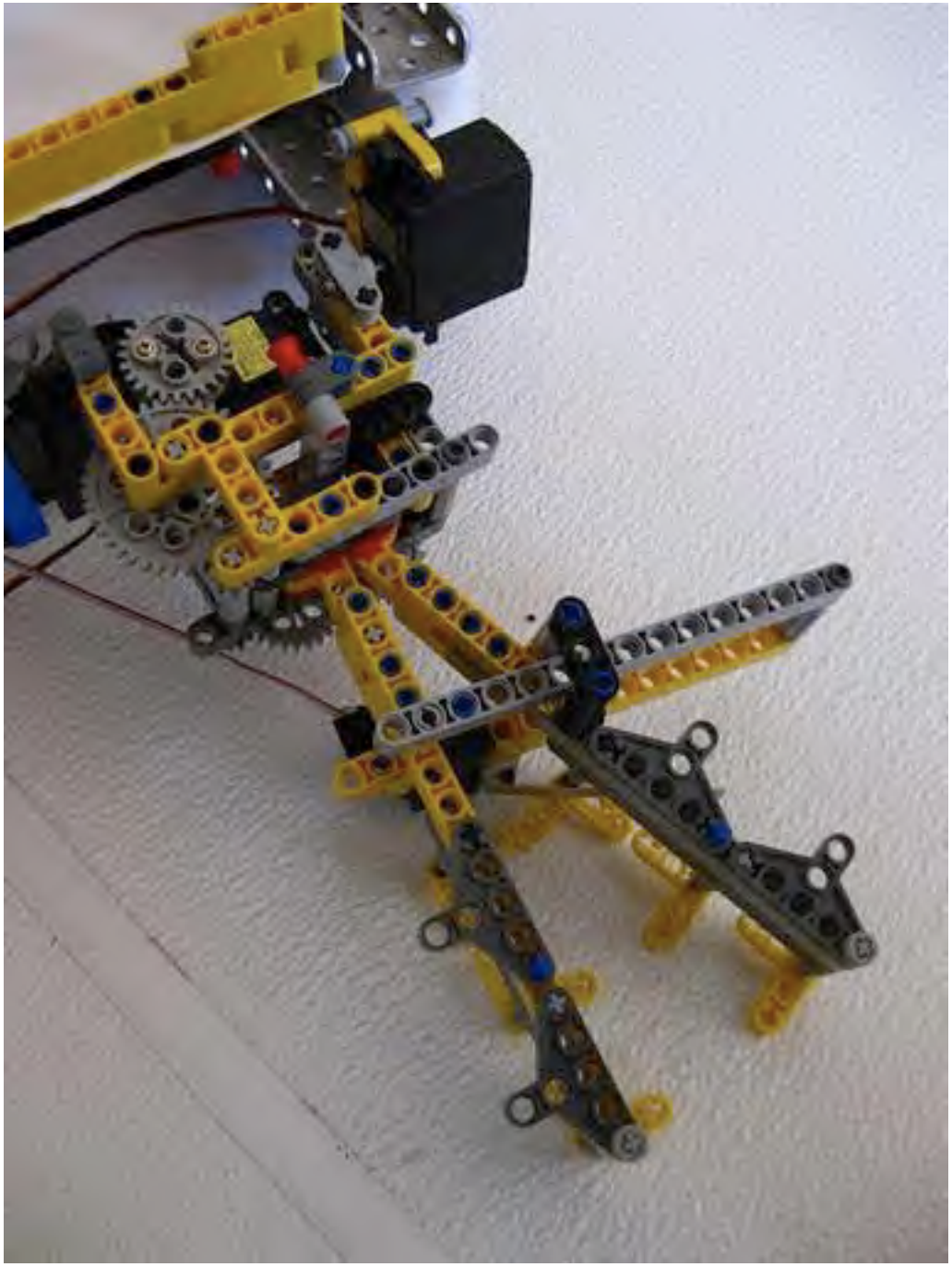
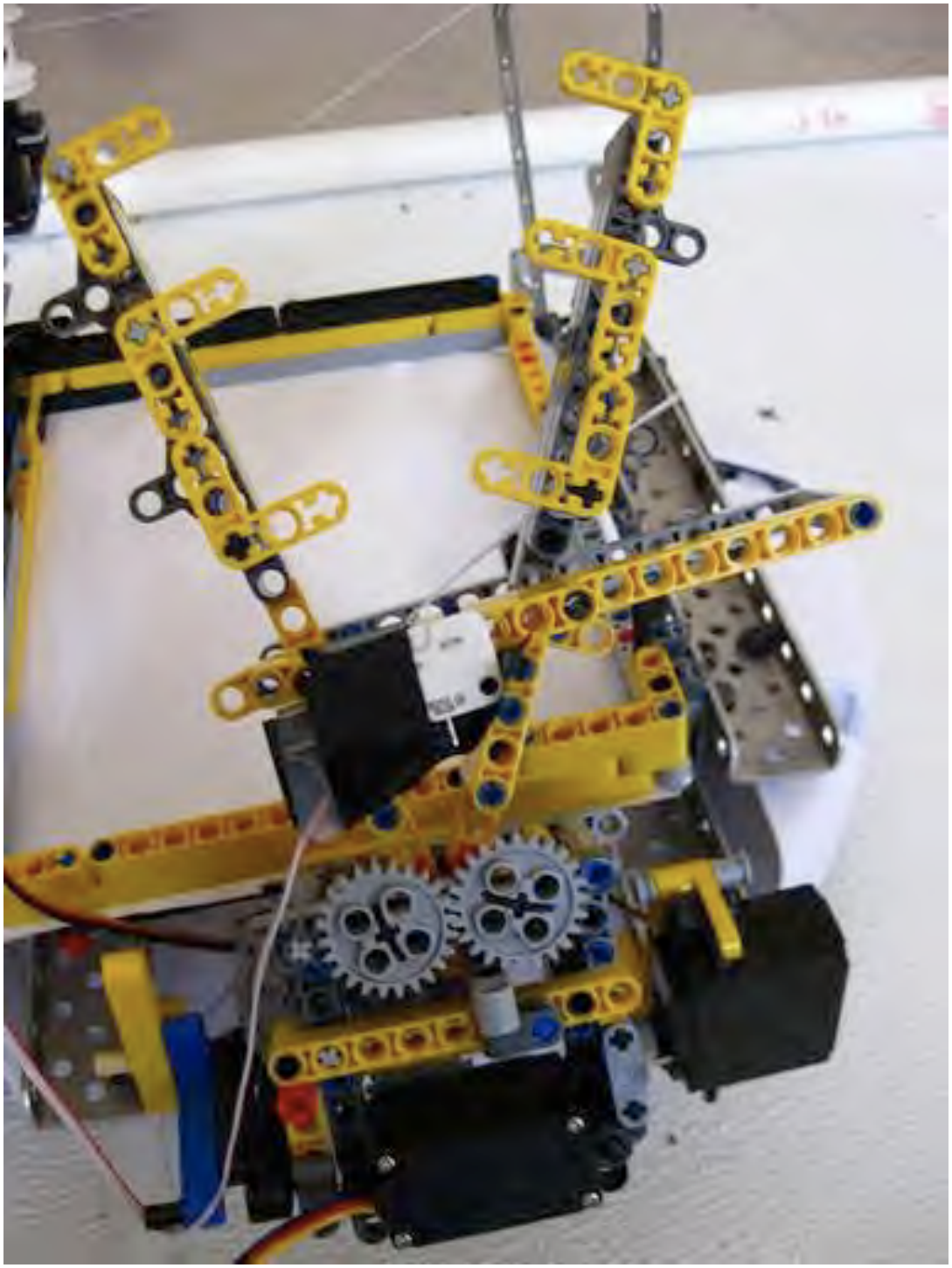
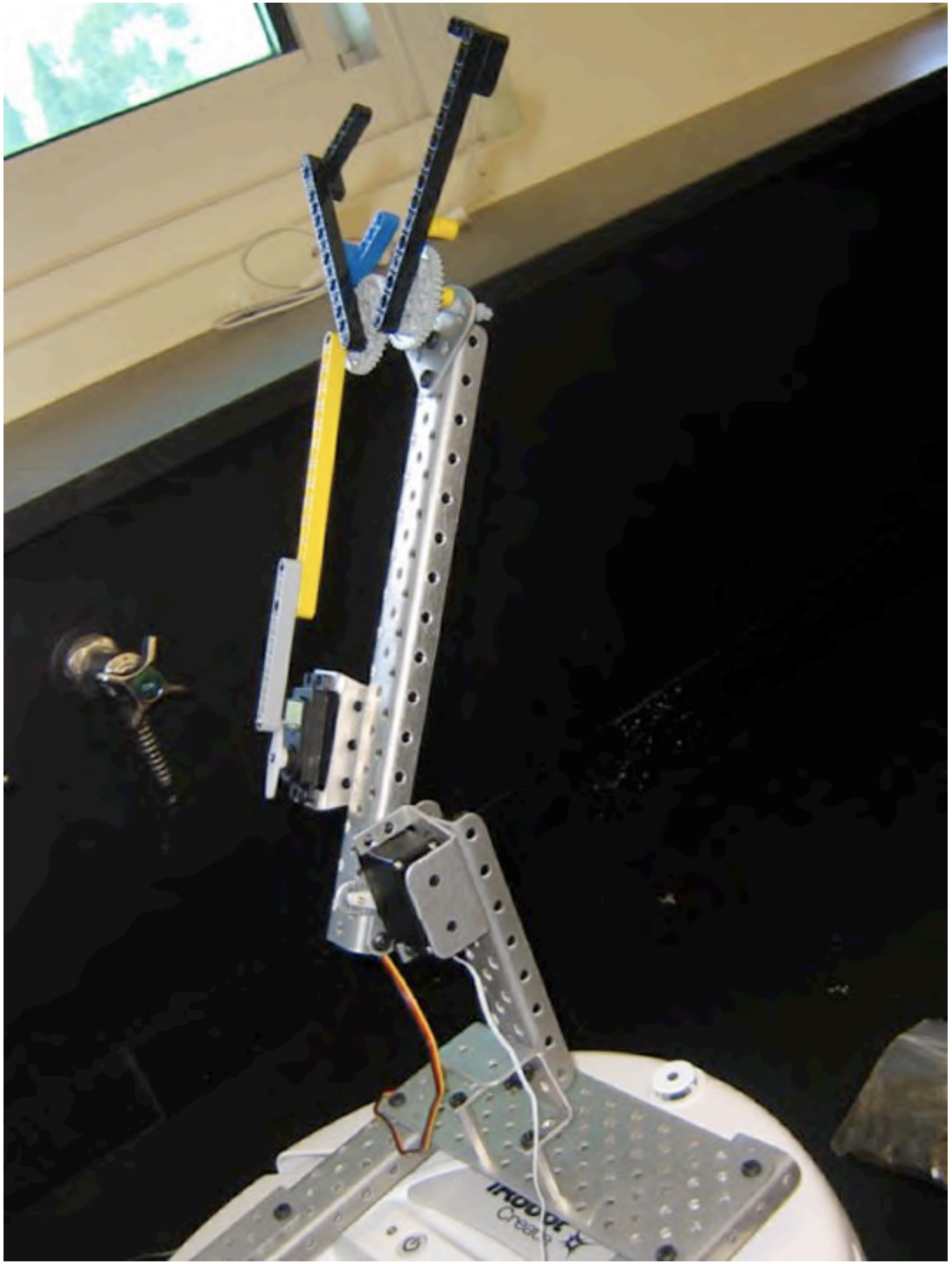
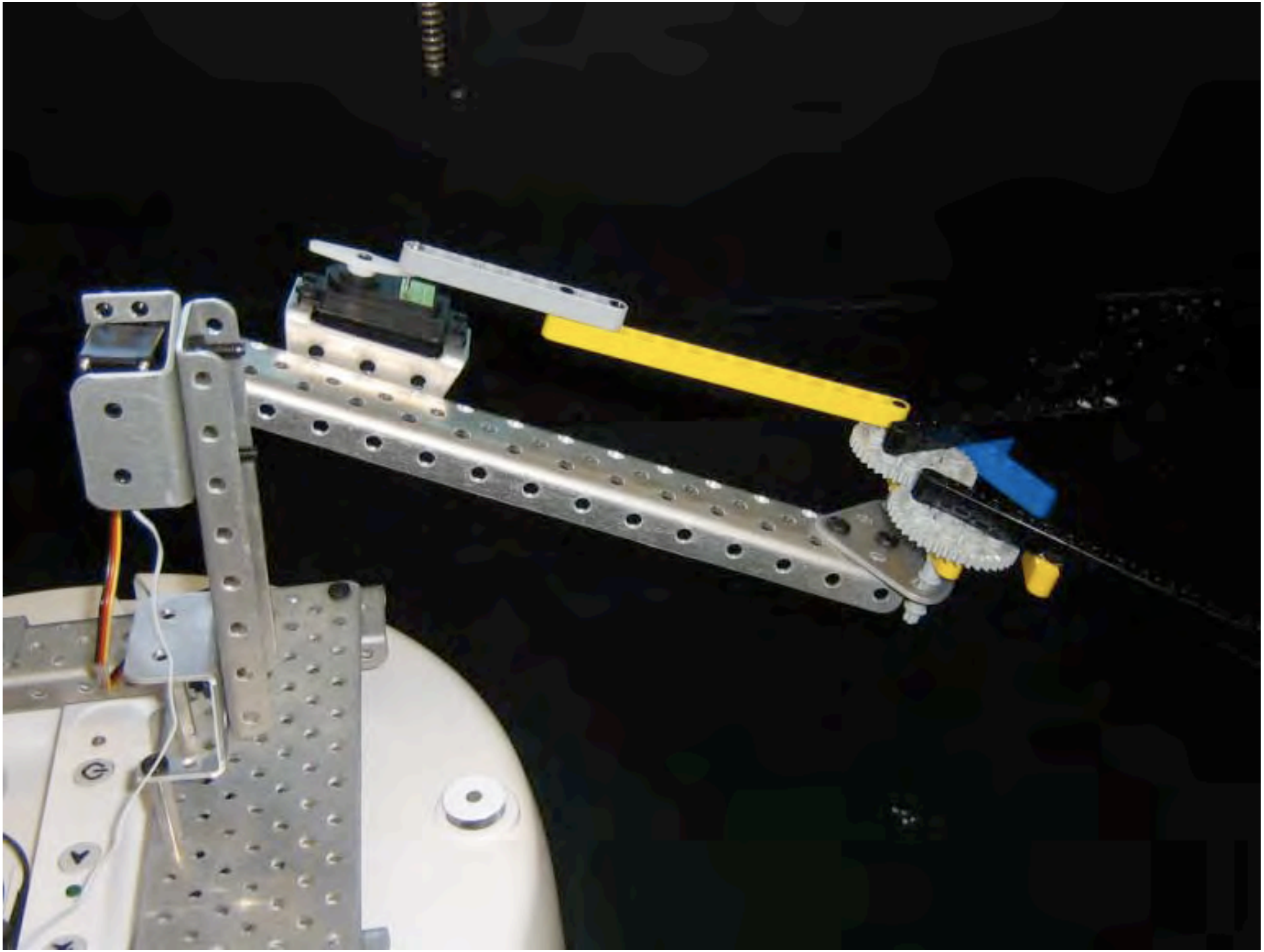


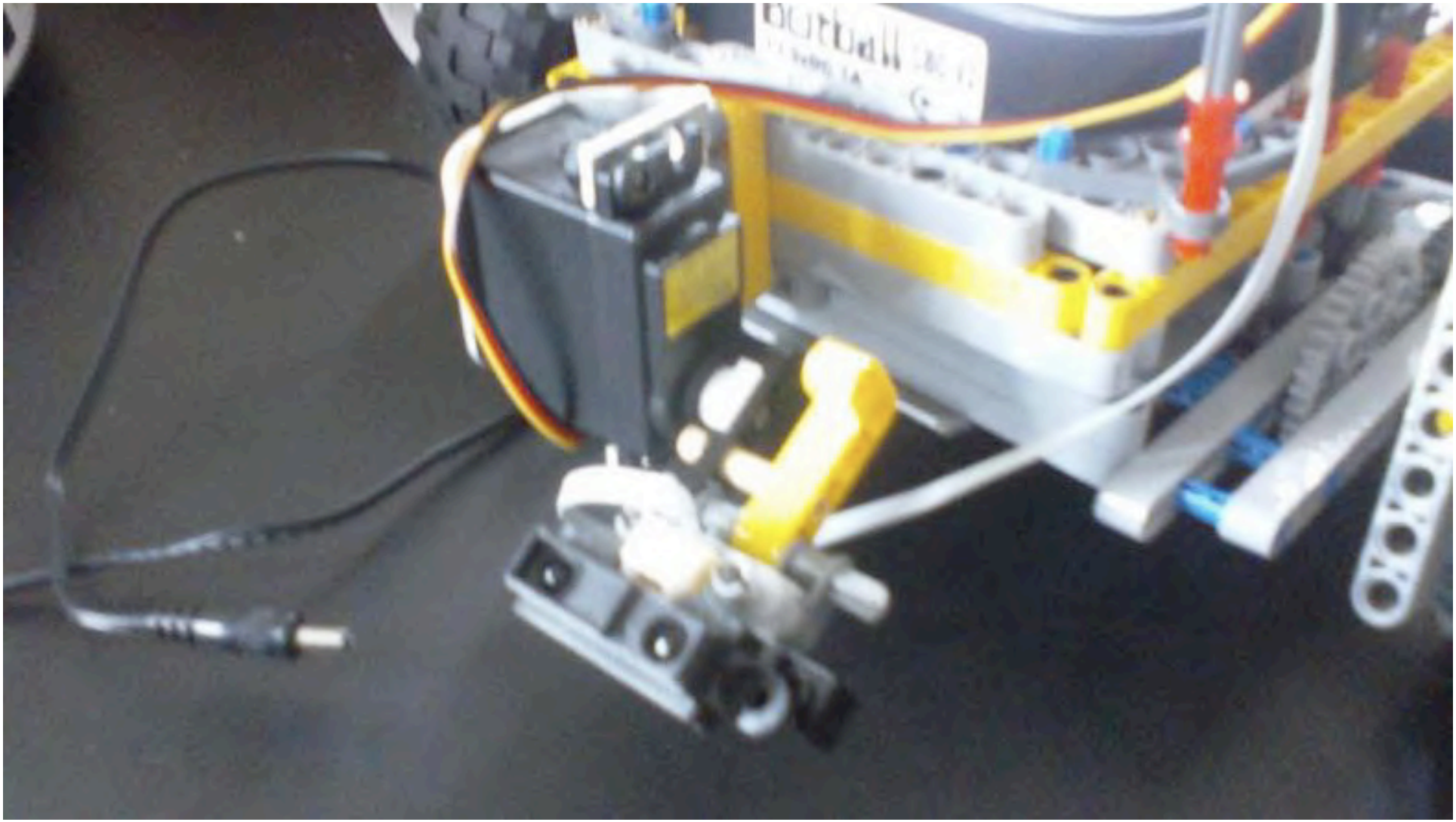




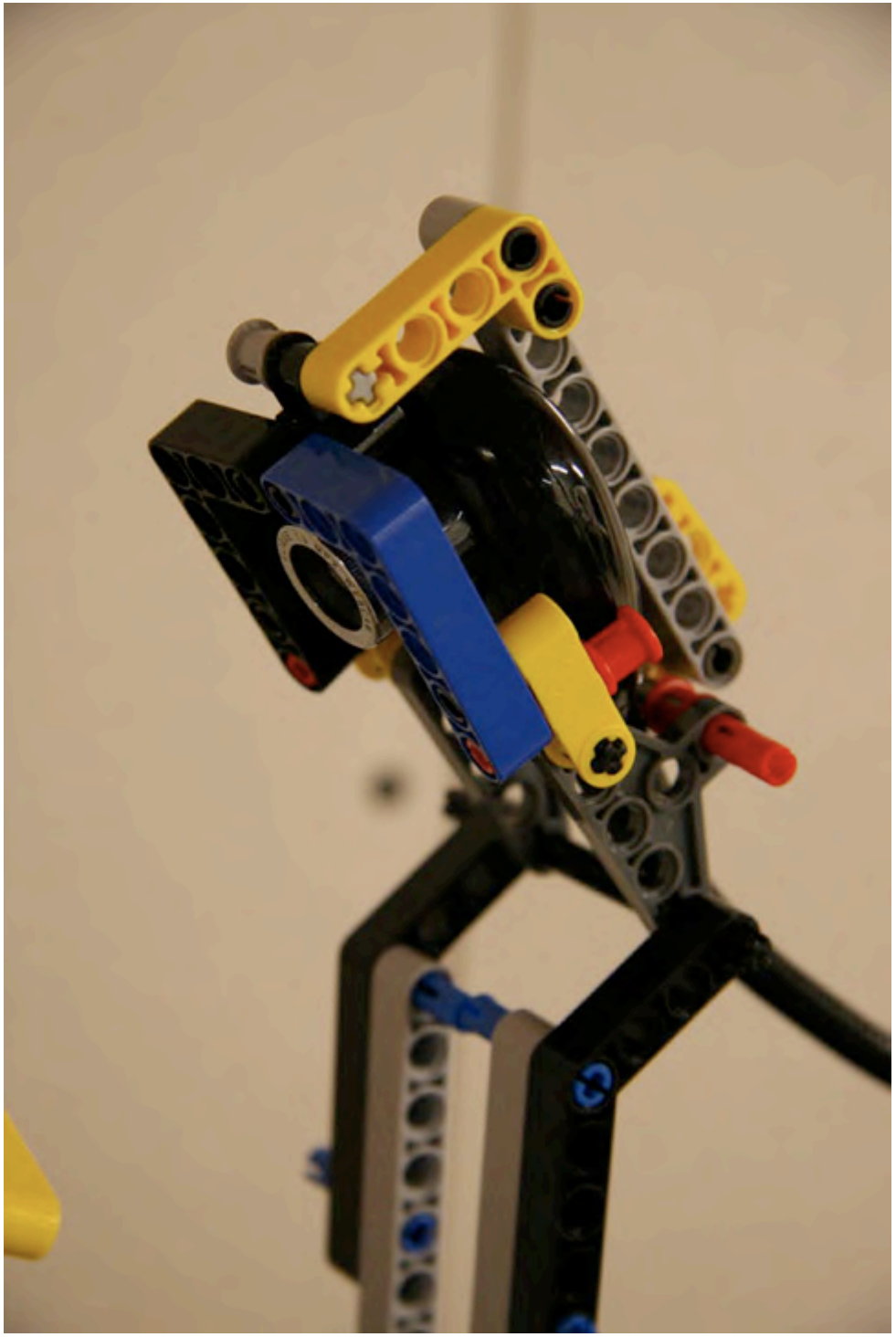


Sensor Mounts

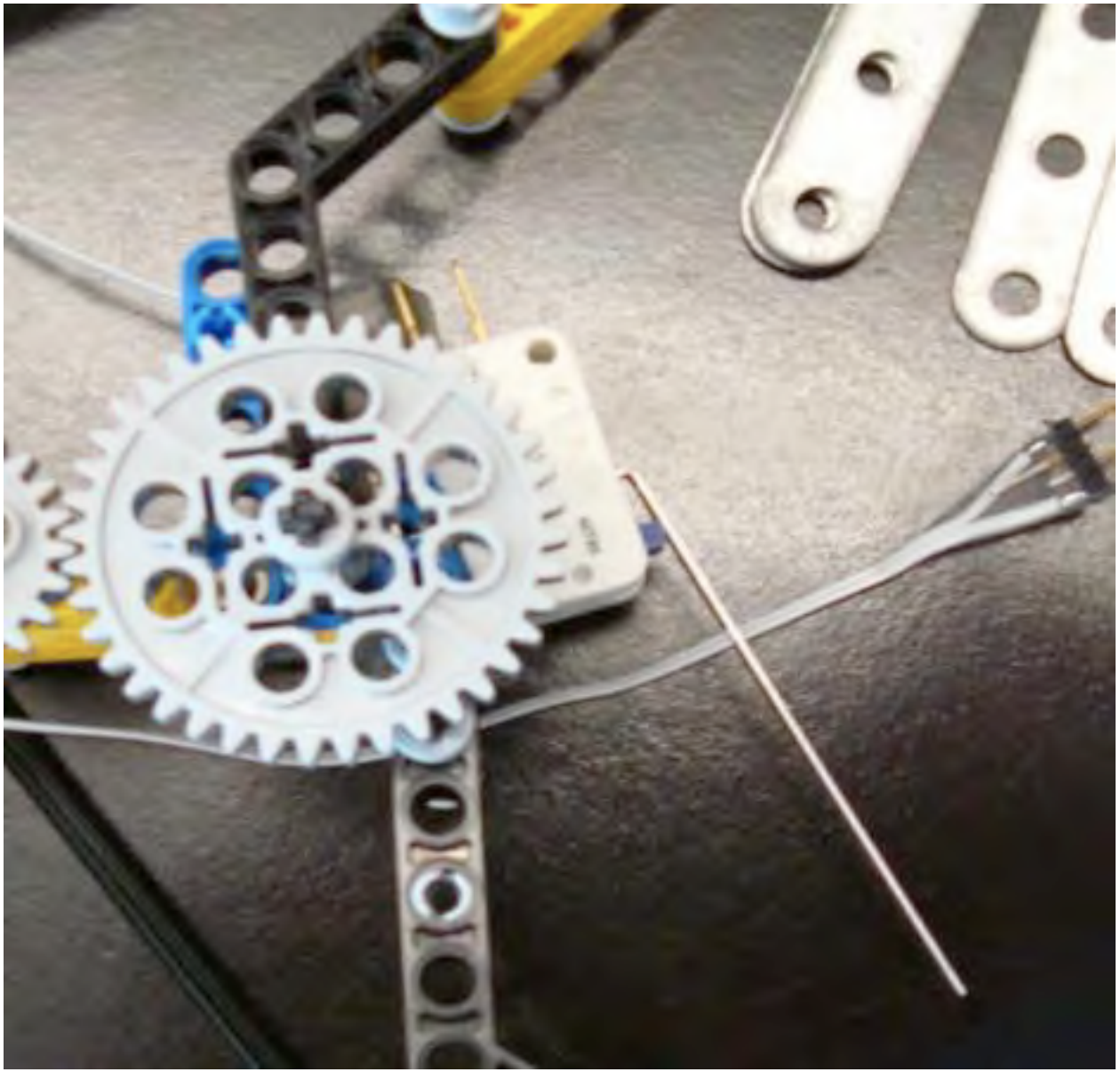
VEX



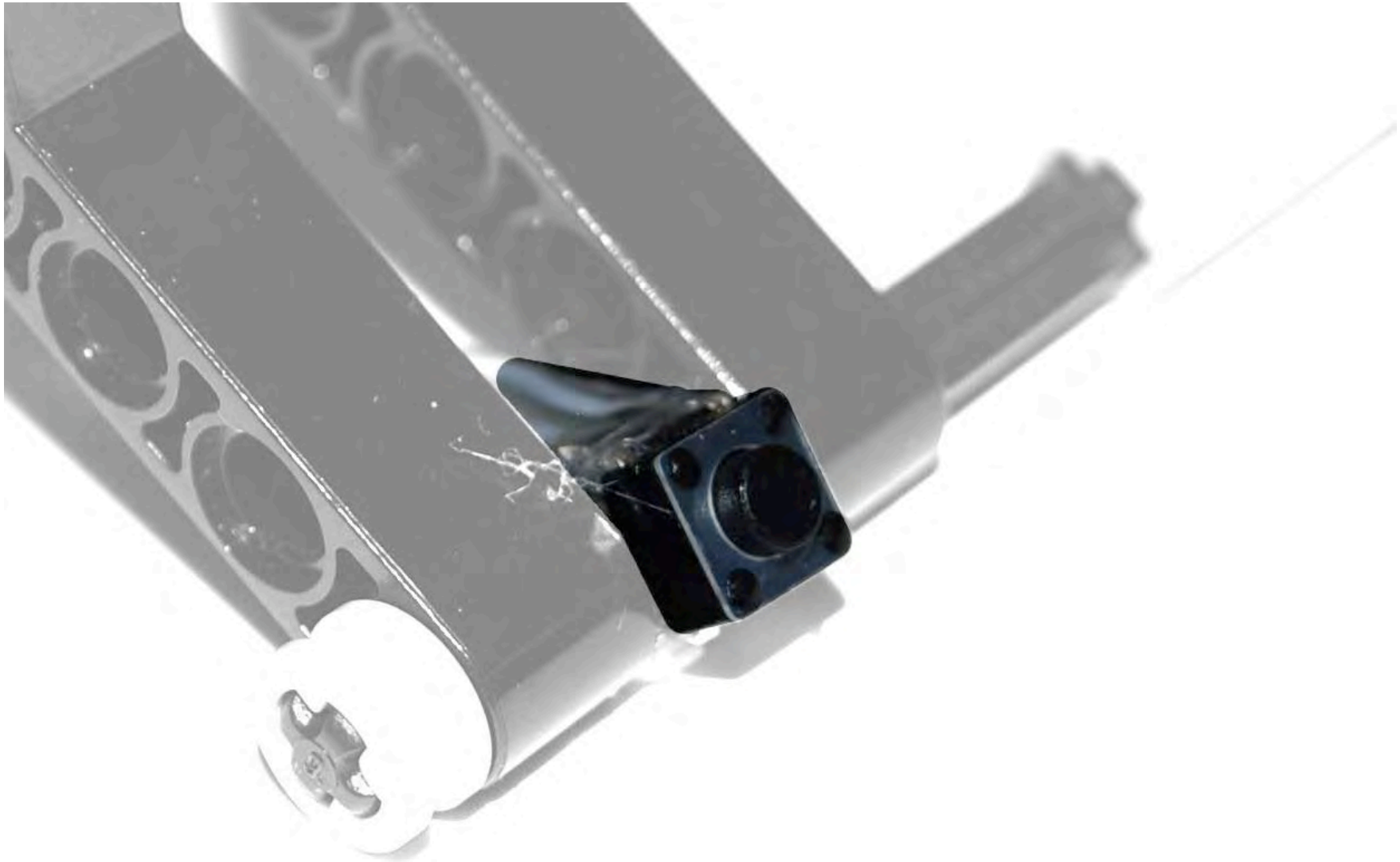
This is the range finder sensor located on the back of the Bot. The range finder is attached to a motor. This is because the robot goes over PVC pipes, and the range finder becomes an obstruction when attempting to do so. The motor simply rotates it so the range finder does not collide with the PVC pipes.



One of the largest problems that we had with our robots last year was keeping the cameras steady enough to reliably find objects. We invested time early on this season to build a solid camera mount with lego parts that is generic enough to be attached to any robot. This mount takes advantage of the lens of the camera and the tapered base to grab it and hold it tightly. It also applies reasonable pressure from the front and rear to pinch the camera. This structure is effective because of its use of L shaped legos and precise spacing.

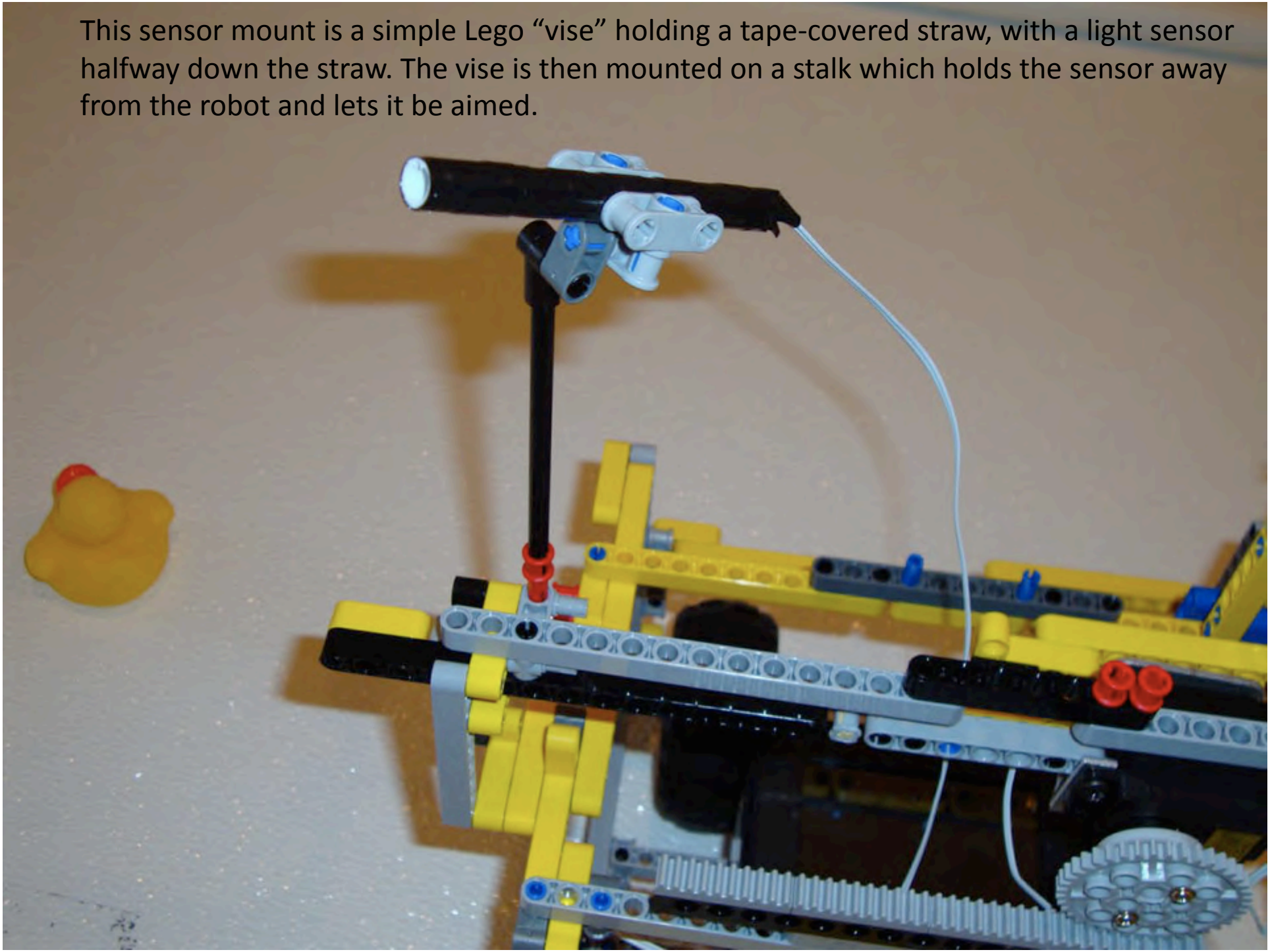


The touch sensor is mounted tightly onto the arm to provide a good surface for the object to trigger the sensor. We also placed it in the middle of the claw because we wanted the object to be in a good position for the arm to close and hold the object



This sensor mount is simply a push button sandwiched between two angled beams and held in place with U-glu. The sensor is arranged like this so it can engage the PVC rails on the game board for positioning.

This sensor mount is a simple Lego “vise” holding a tape-covered straw, with a light sensor halfway down the straw. The vise is then mounted on a stalk which holds the sensor away from the robot and lets it be aimed.



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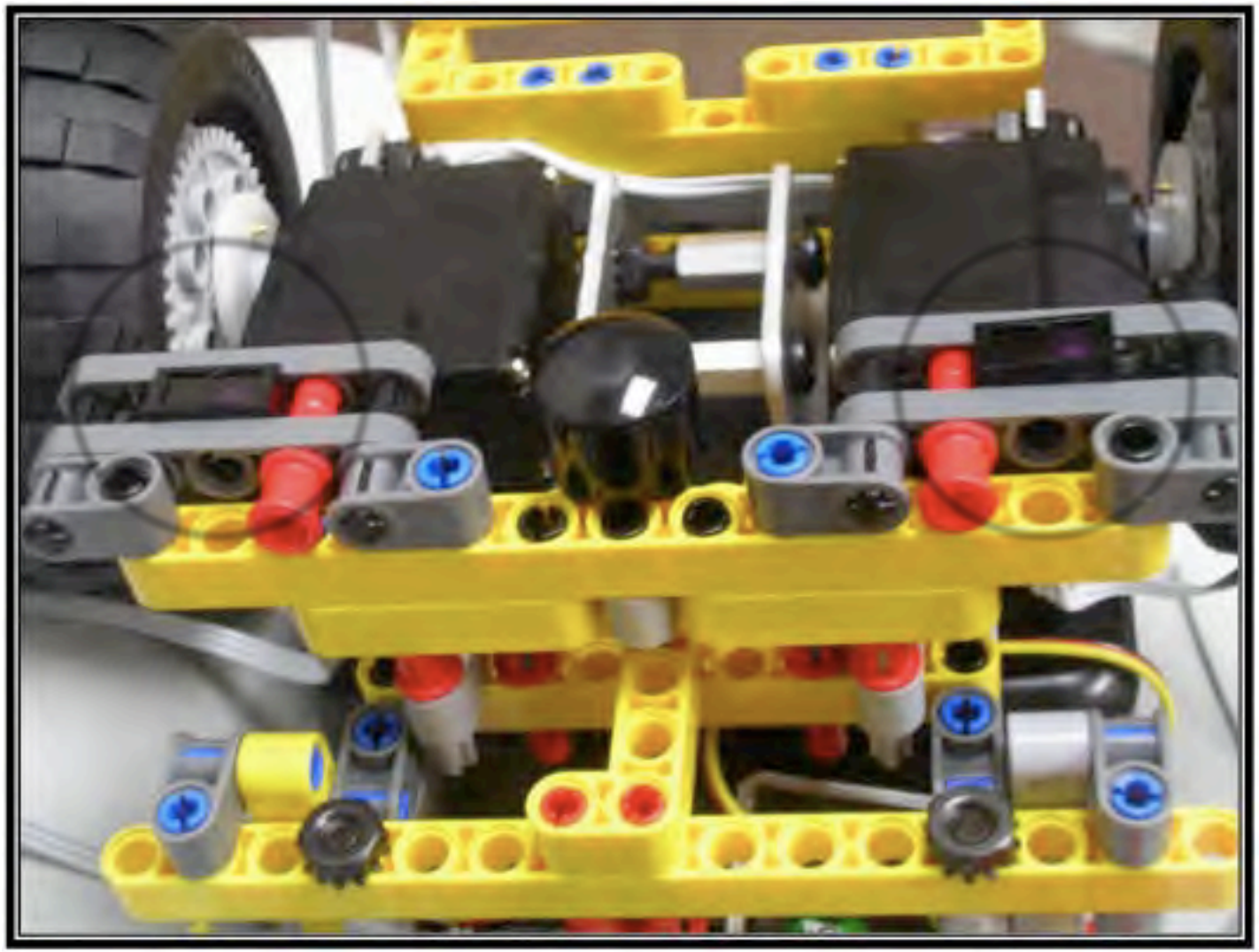
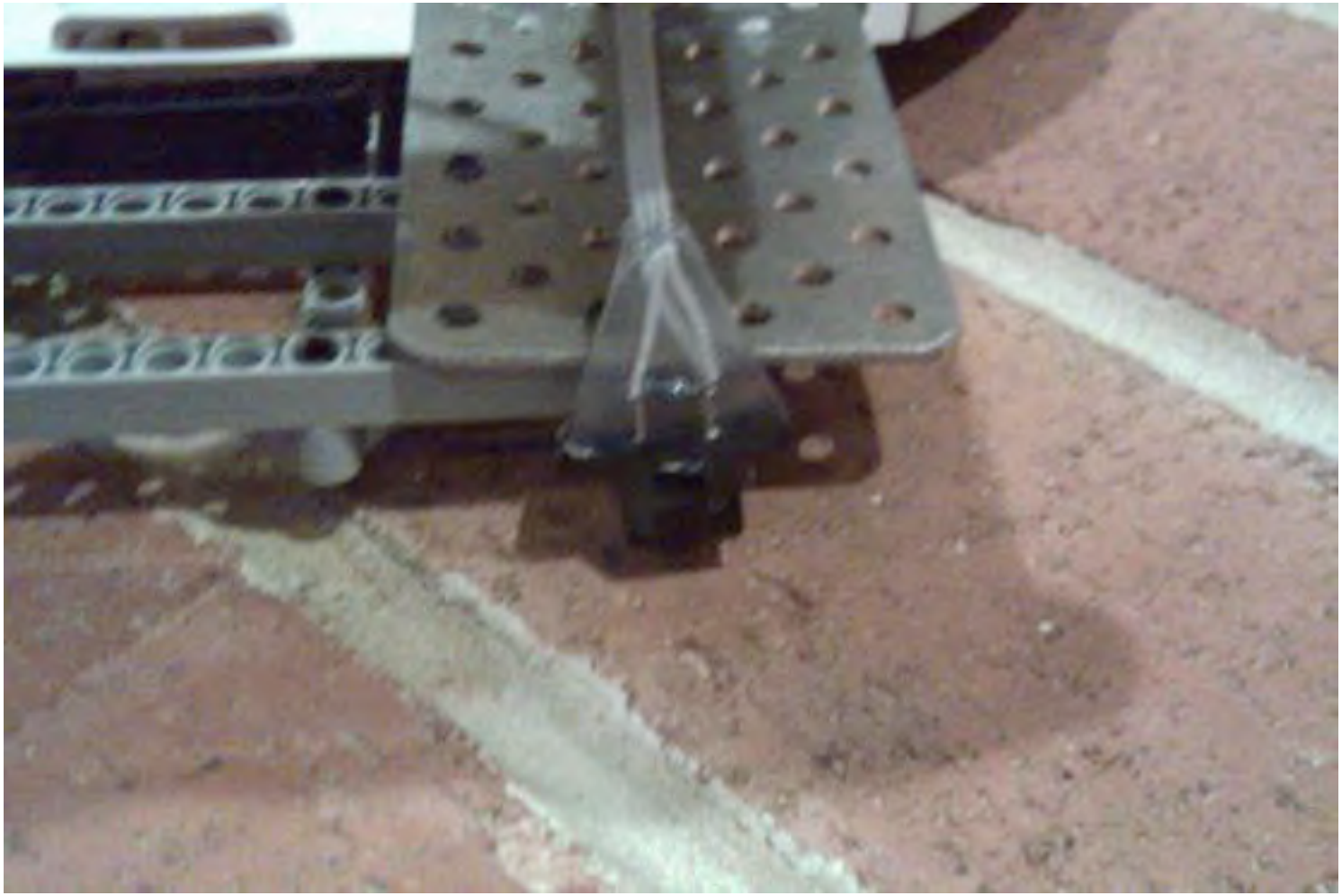
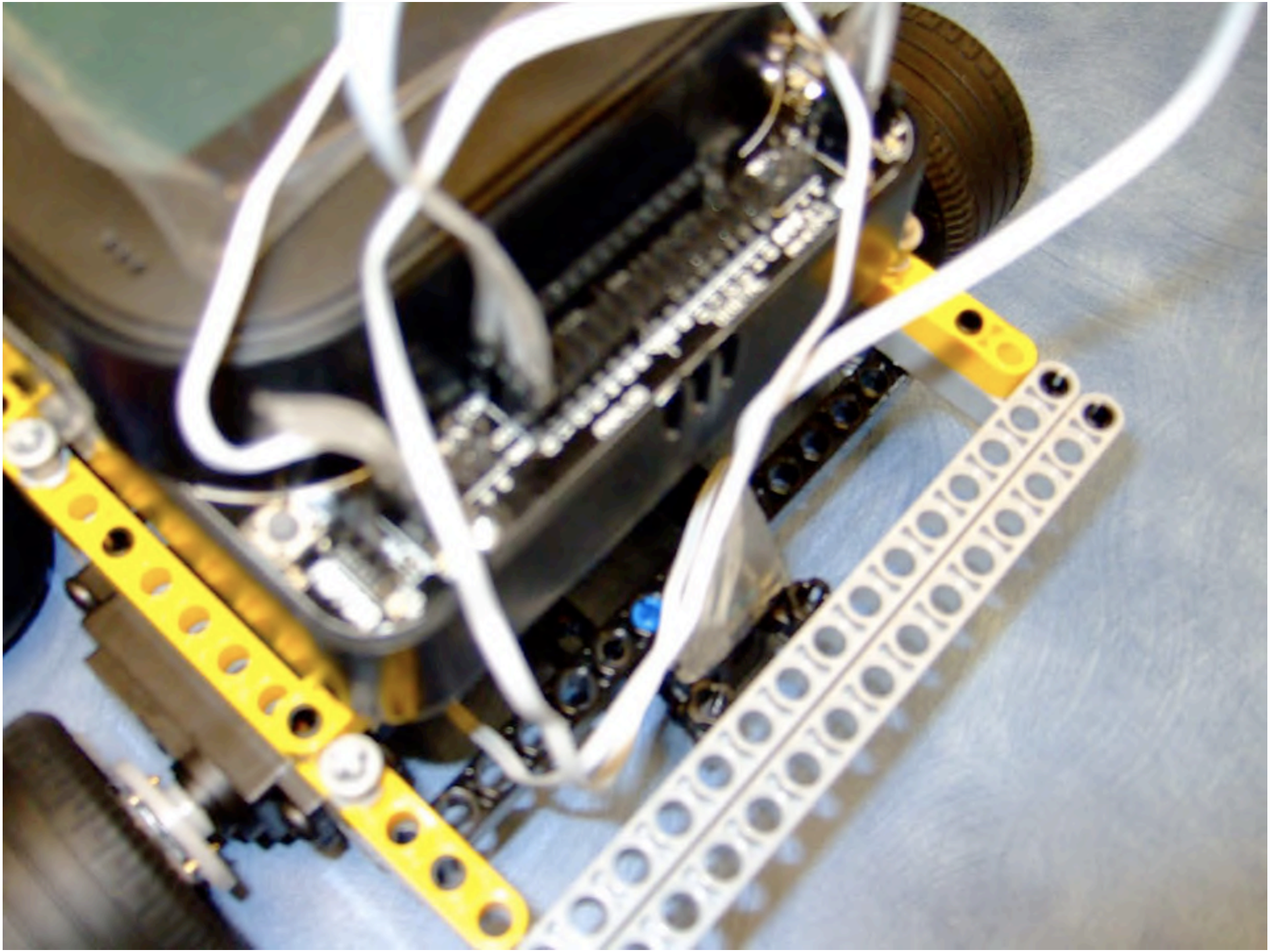
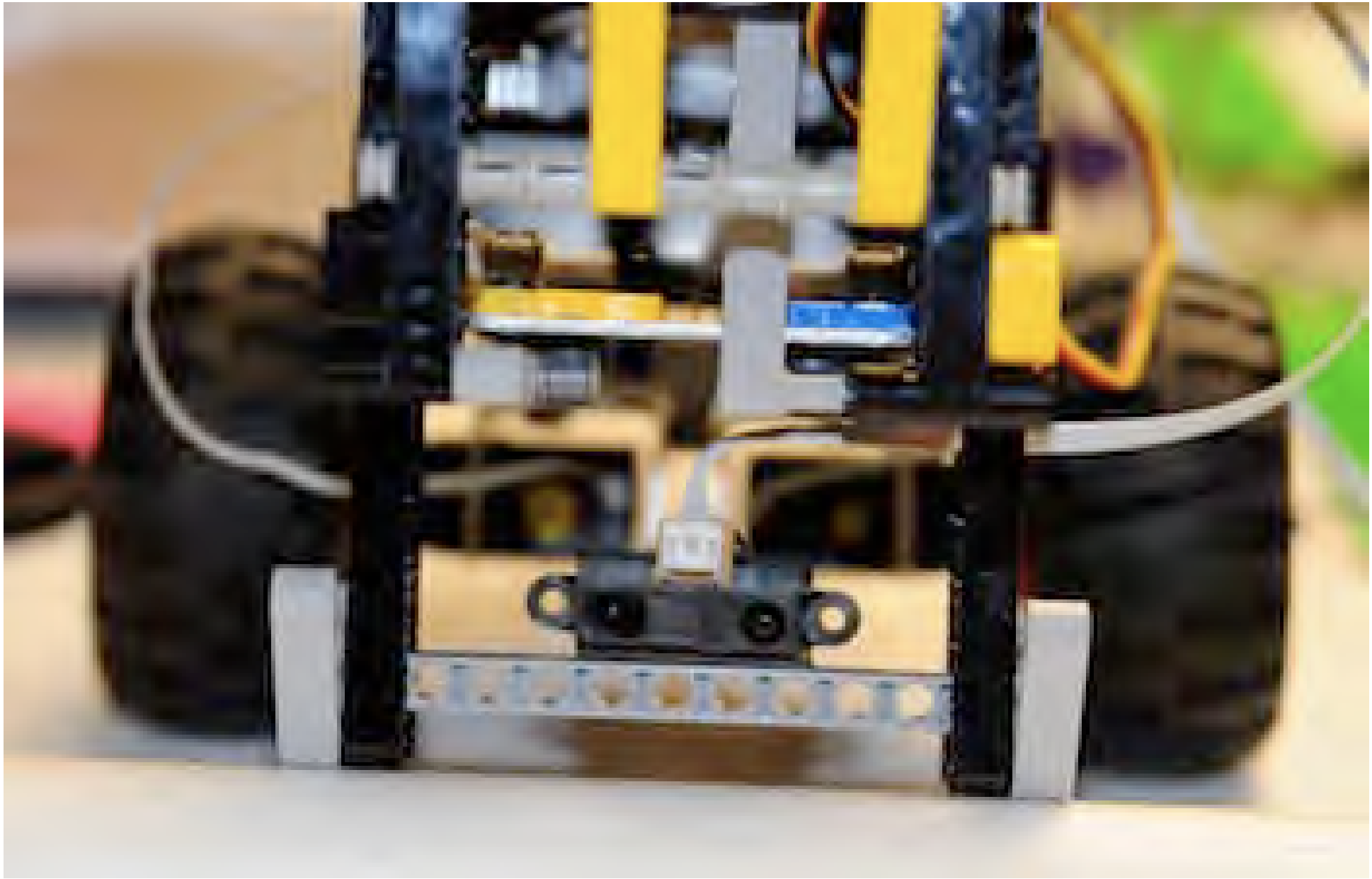
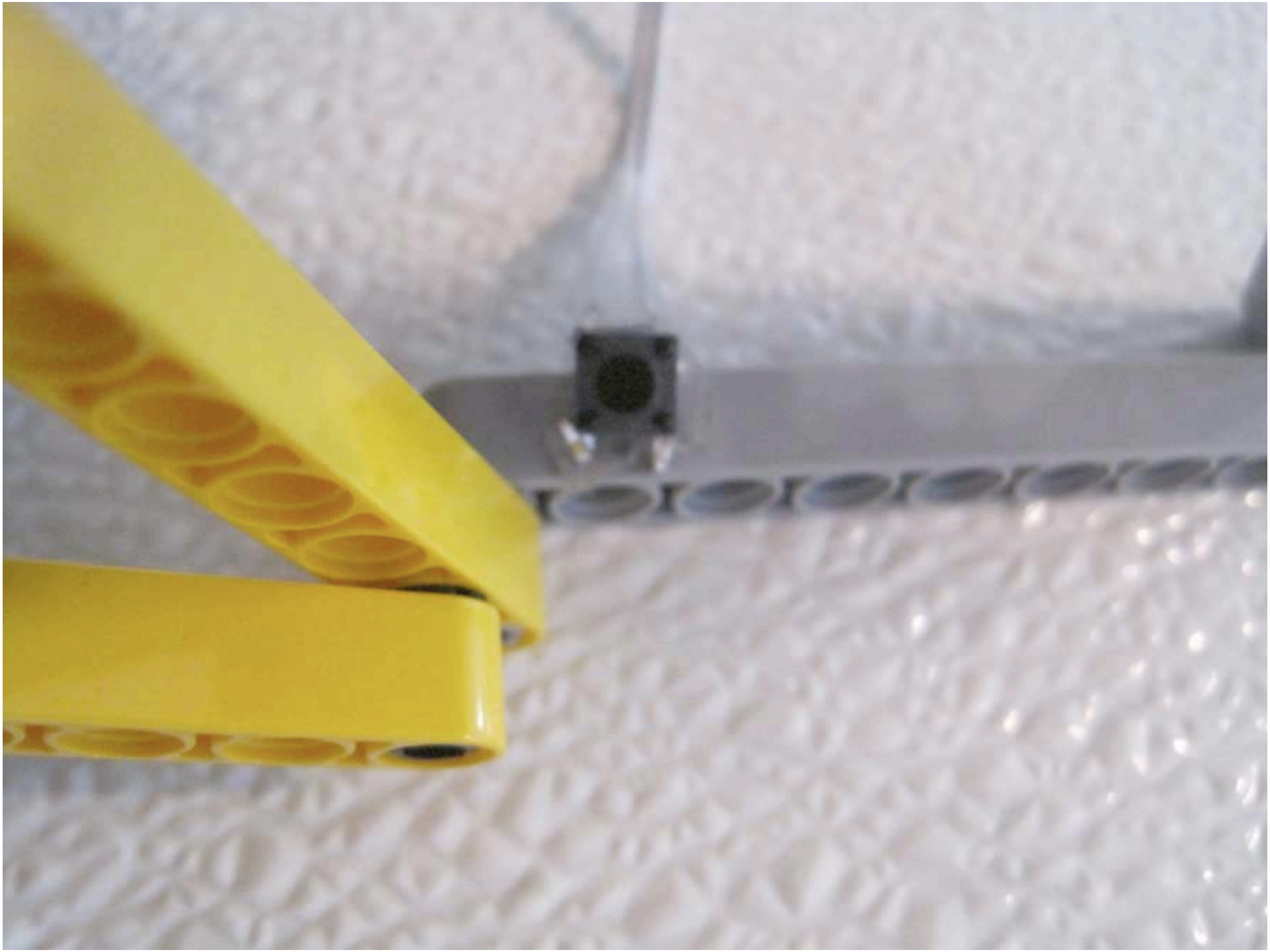


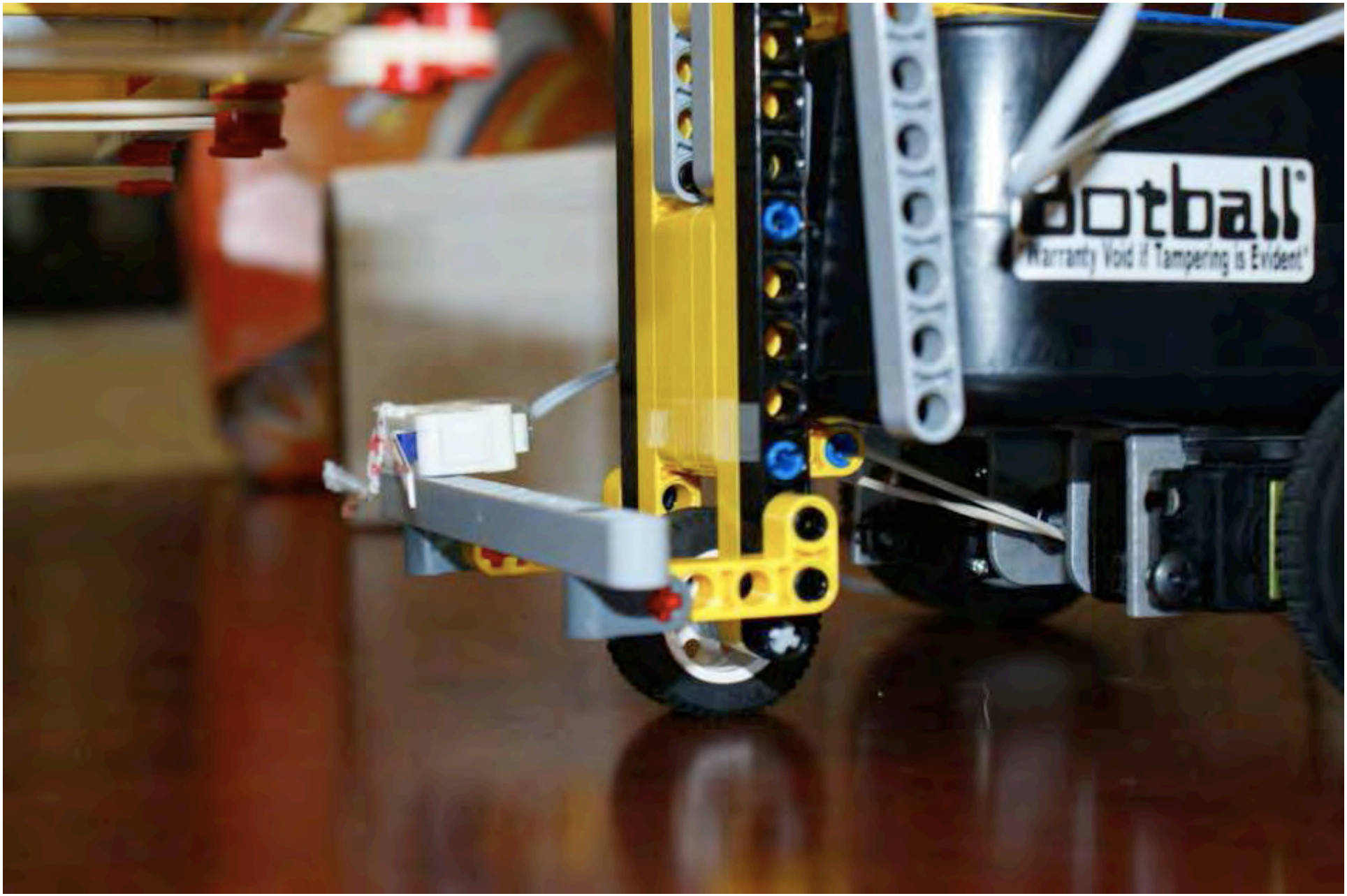
The two objects circled in yellow in the picture above are the infrared sensors that are mounted on the front of the chassis. We used two size 5 LEGO bars, which were attached to the chassis by axles, Technic Triangles, and pins. It holds the sensors close to the ground at a constant distance to increase reliability. The mount, which holds the sensor in place tightly, also provides security for the sensor.

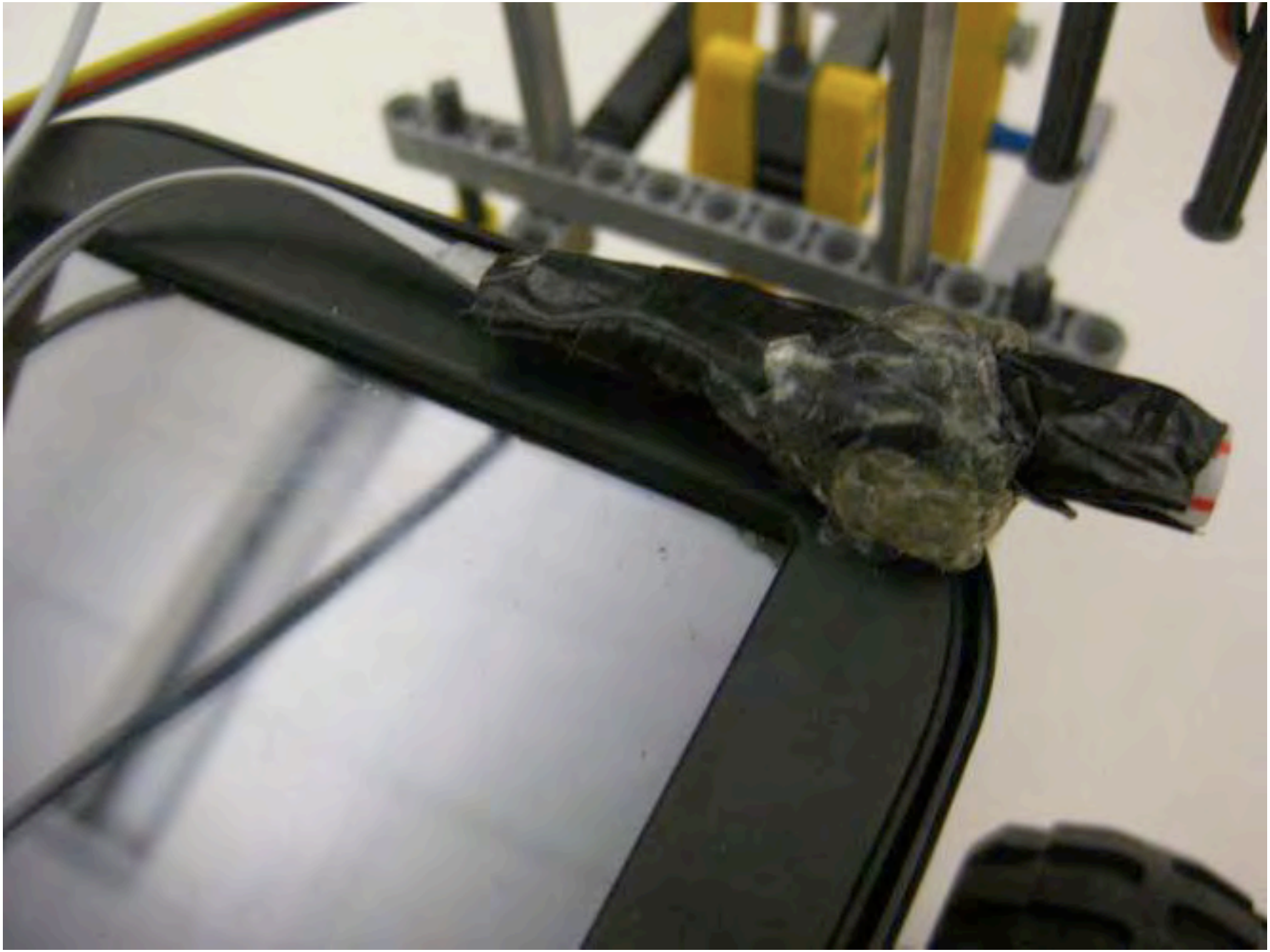


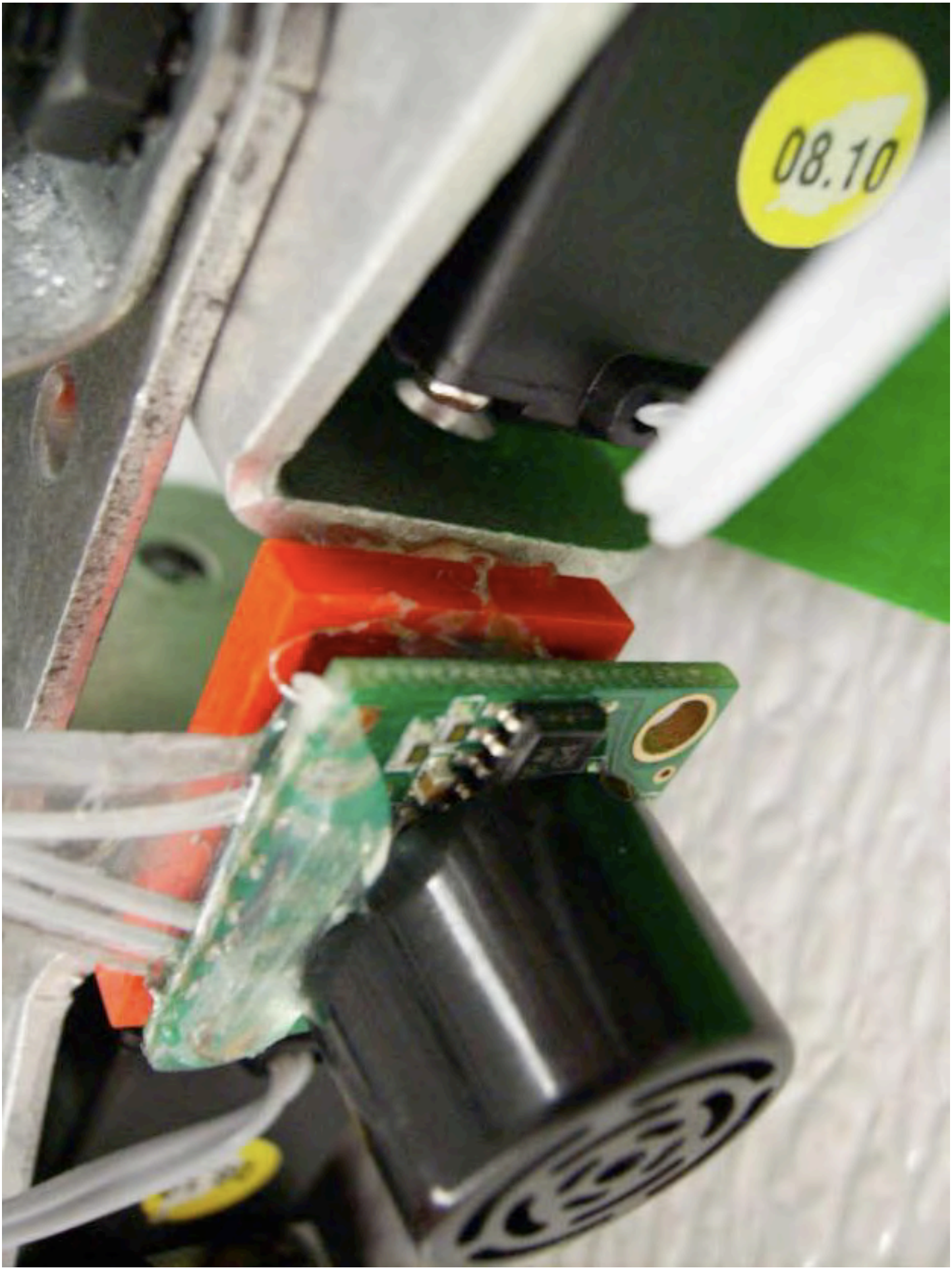







botball
Warranty Void if Tampering is Evident

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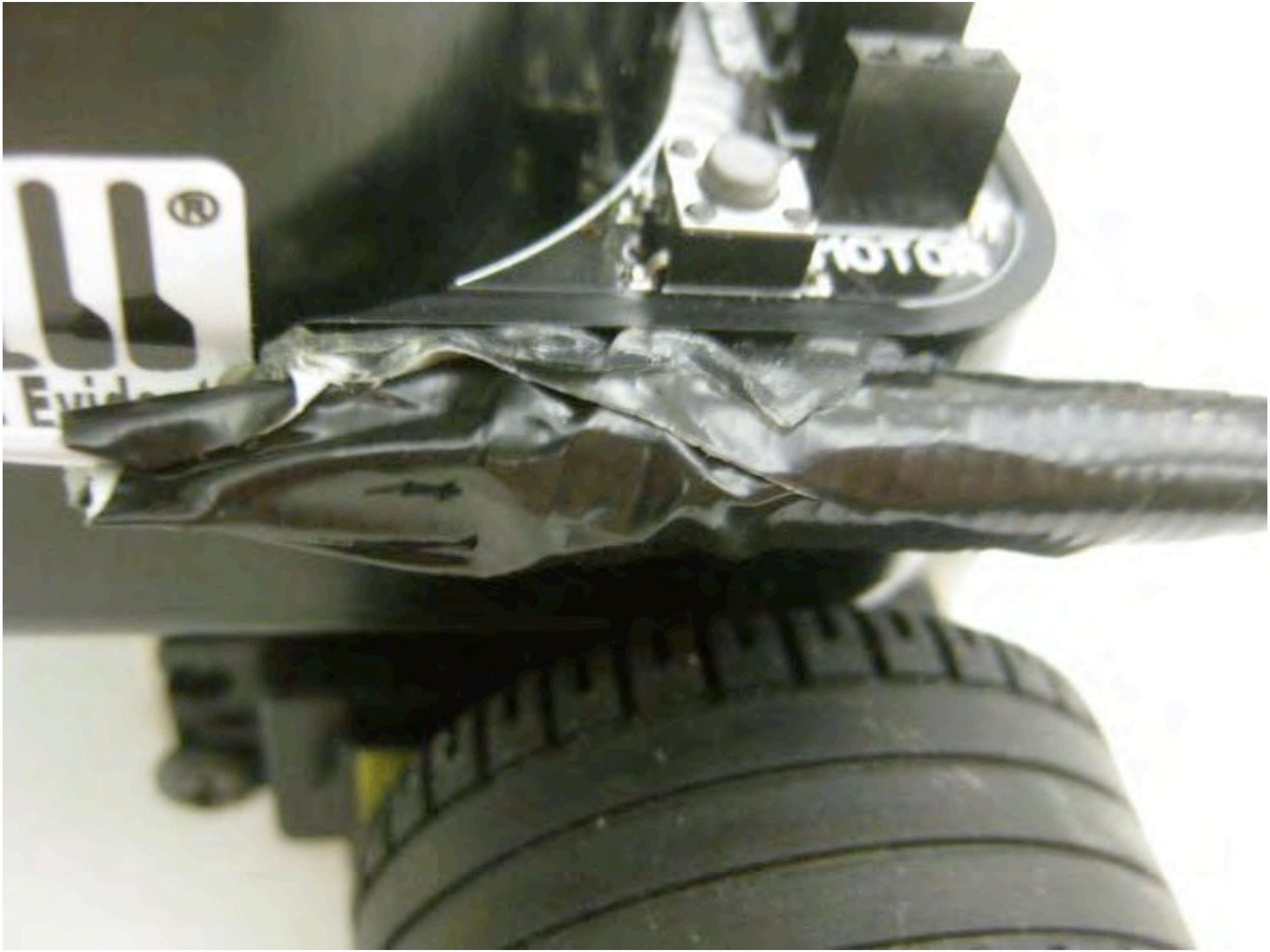
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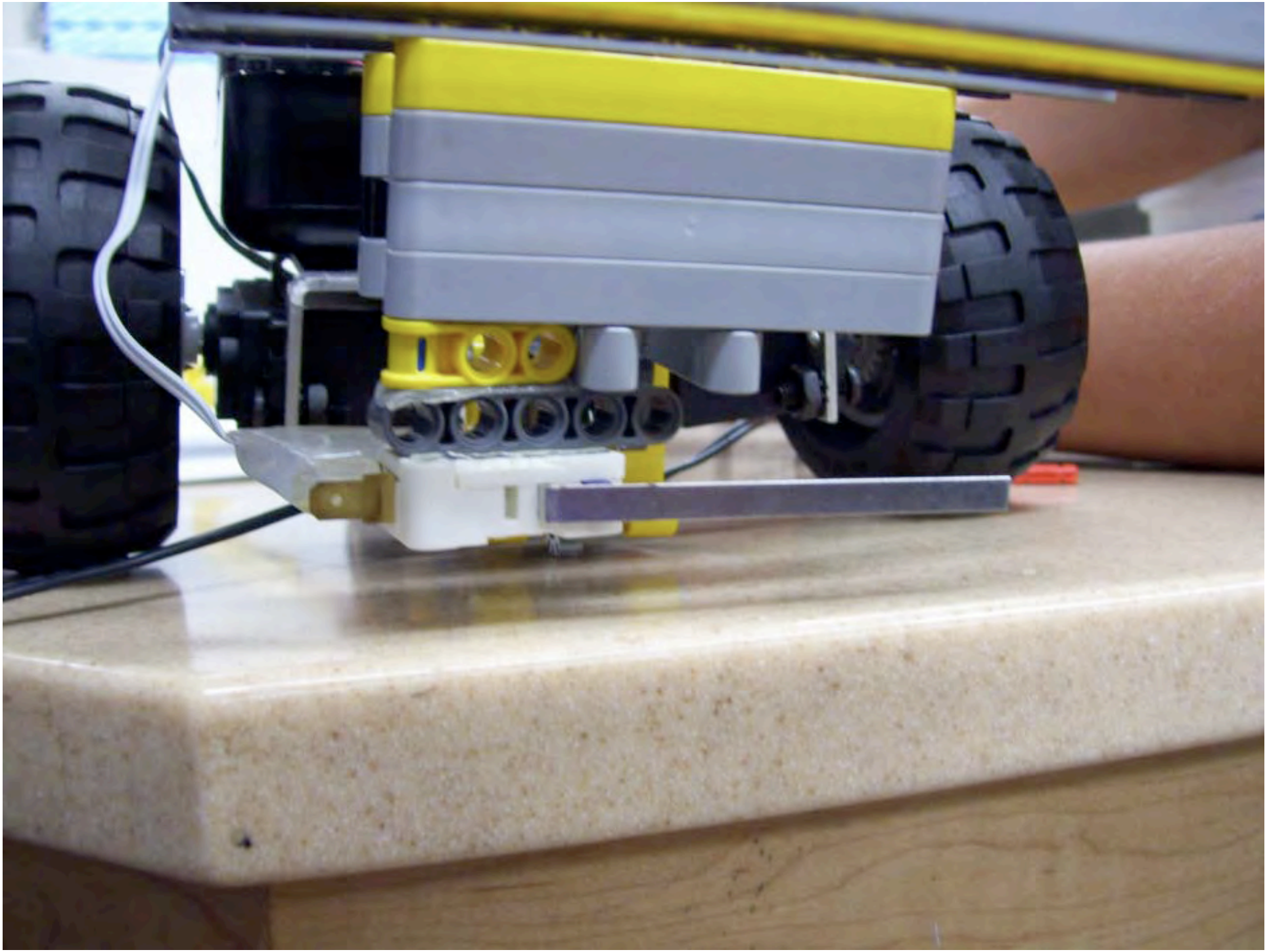

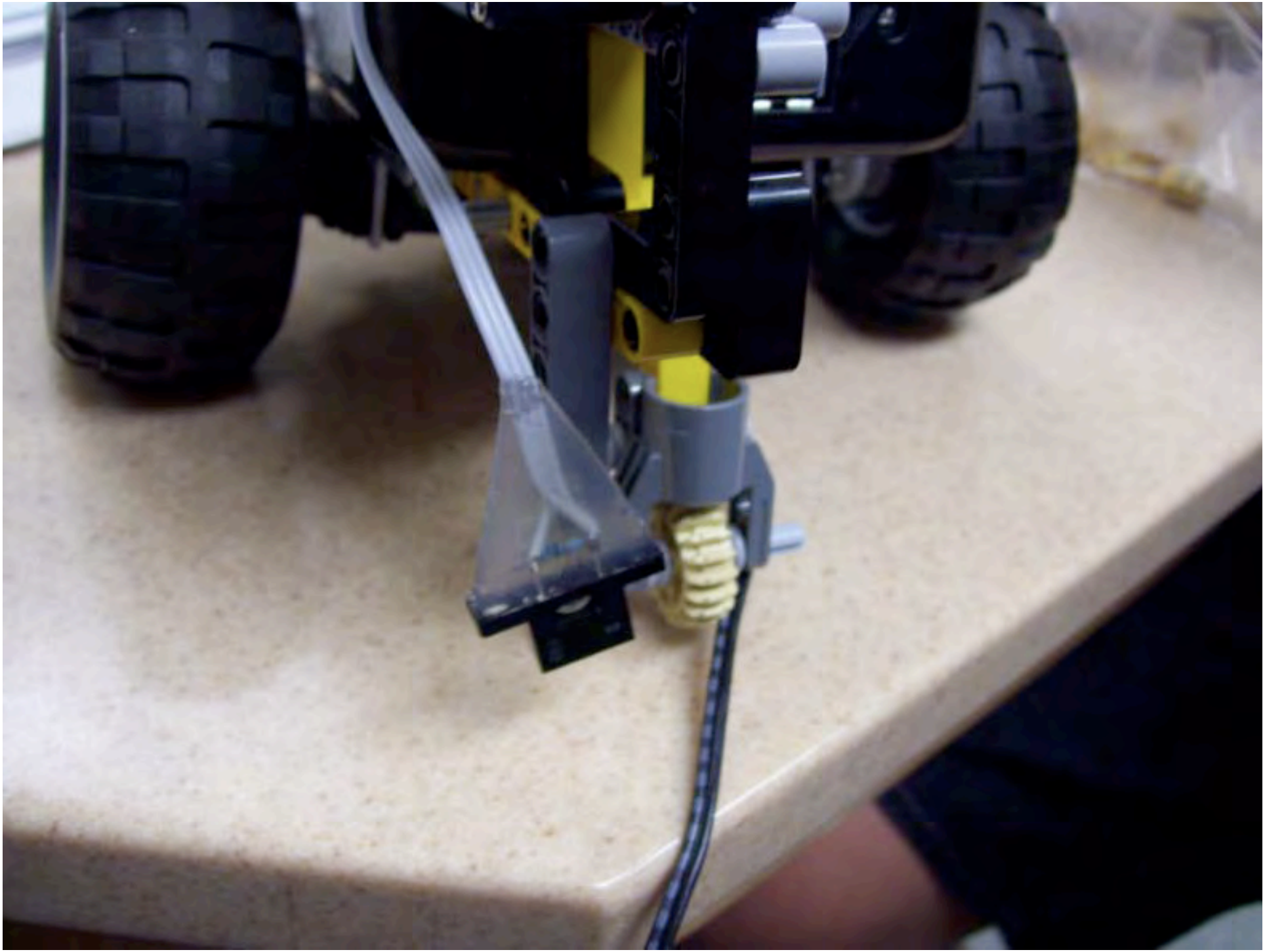

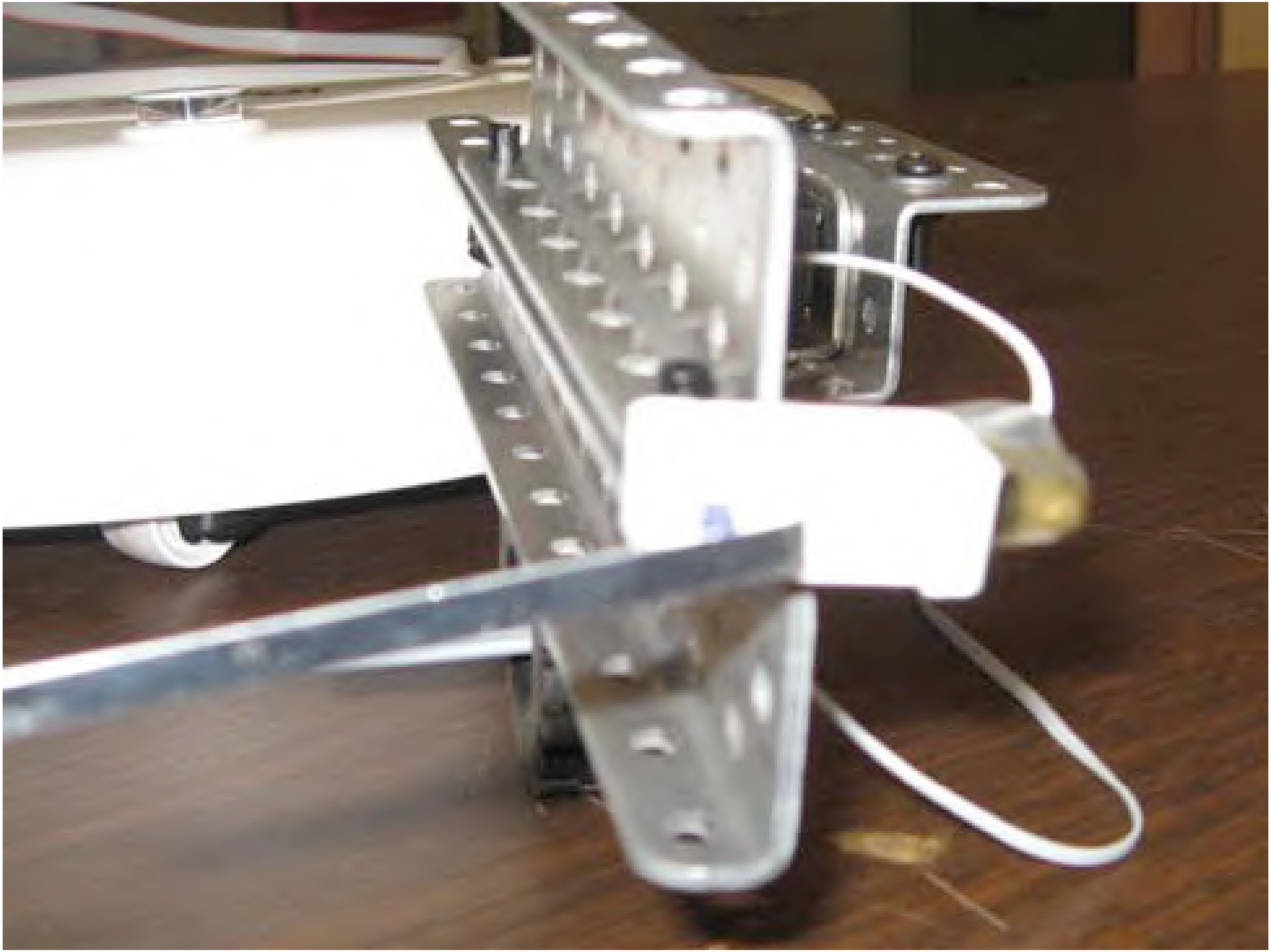

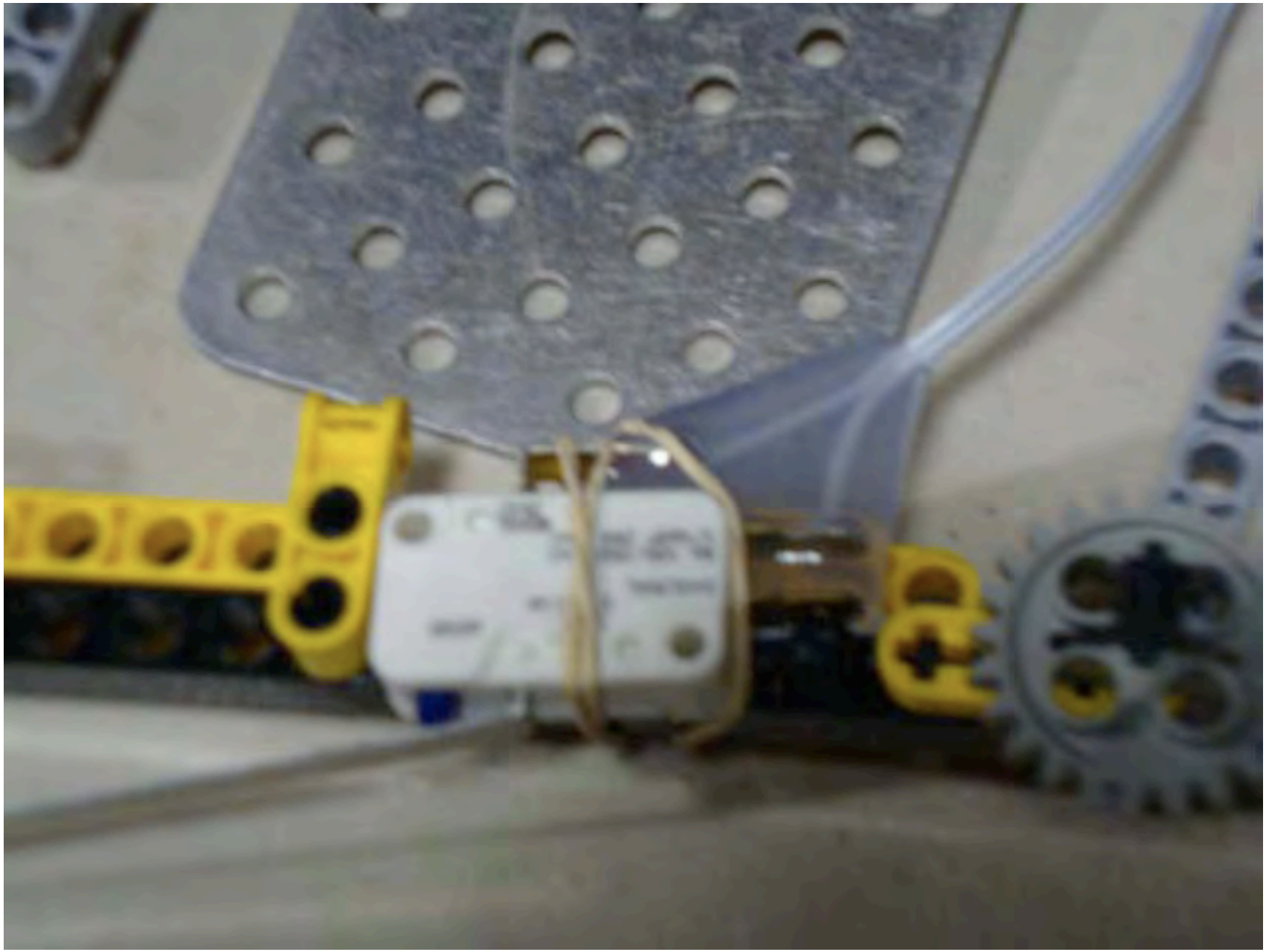

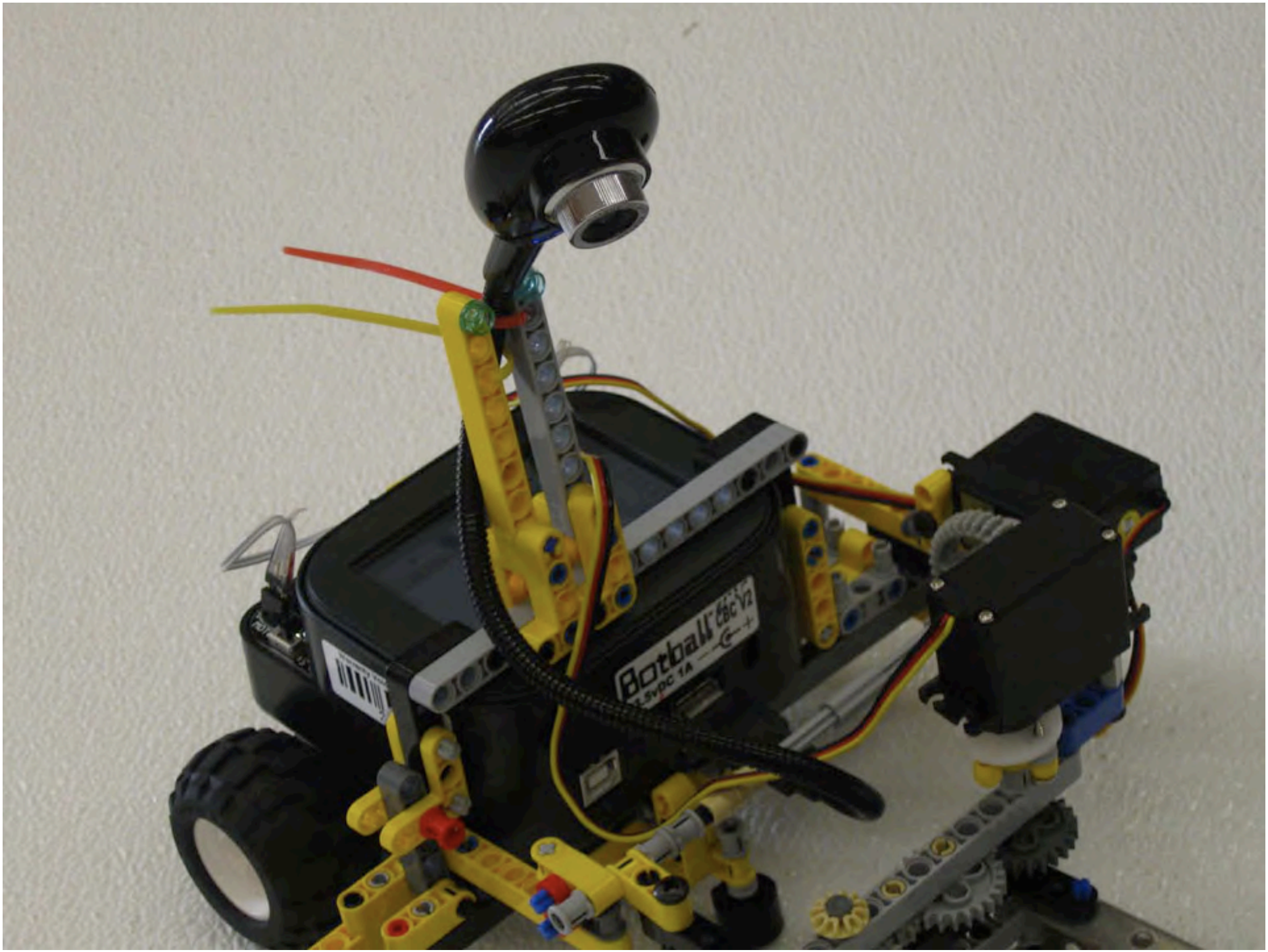
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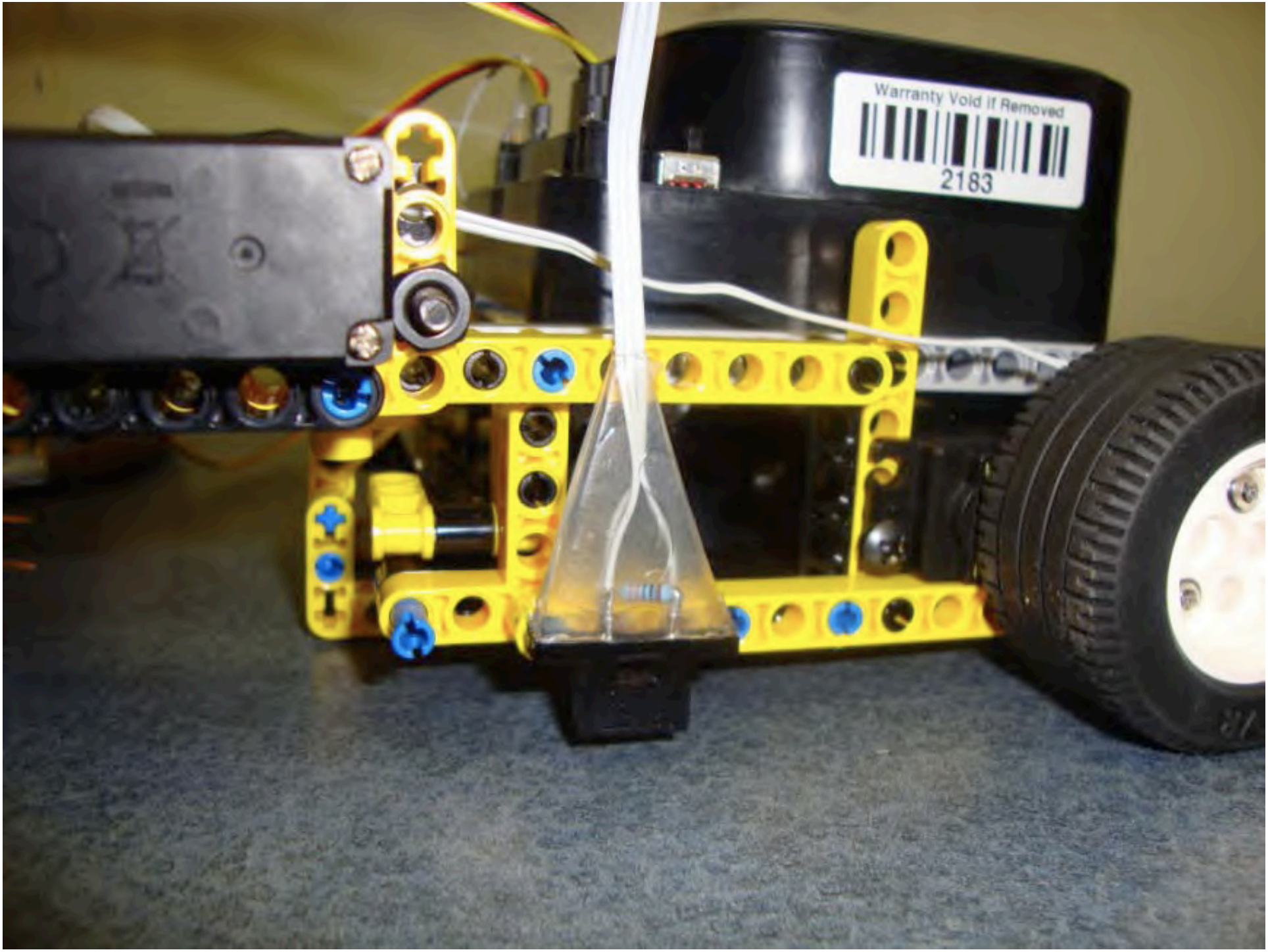
Warranty Void If Removed
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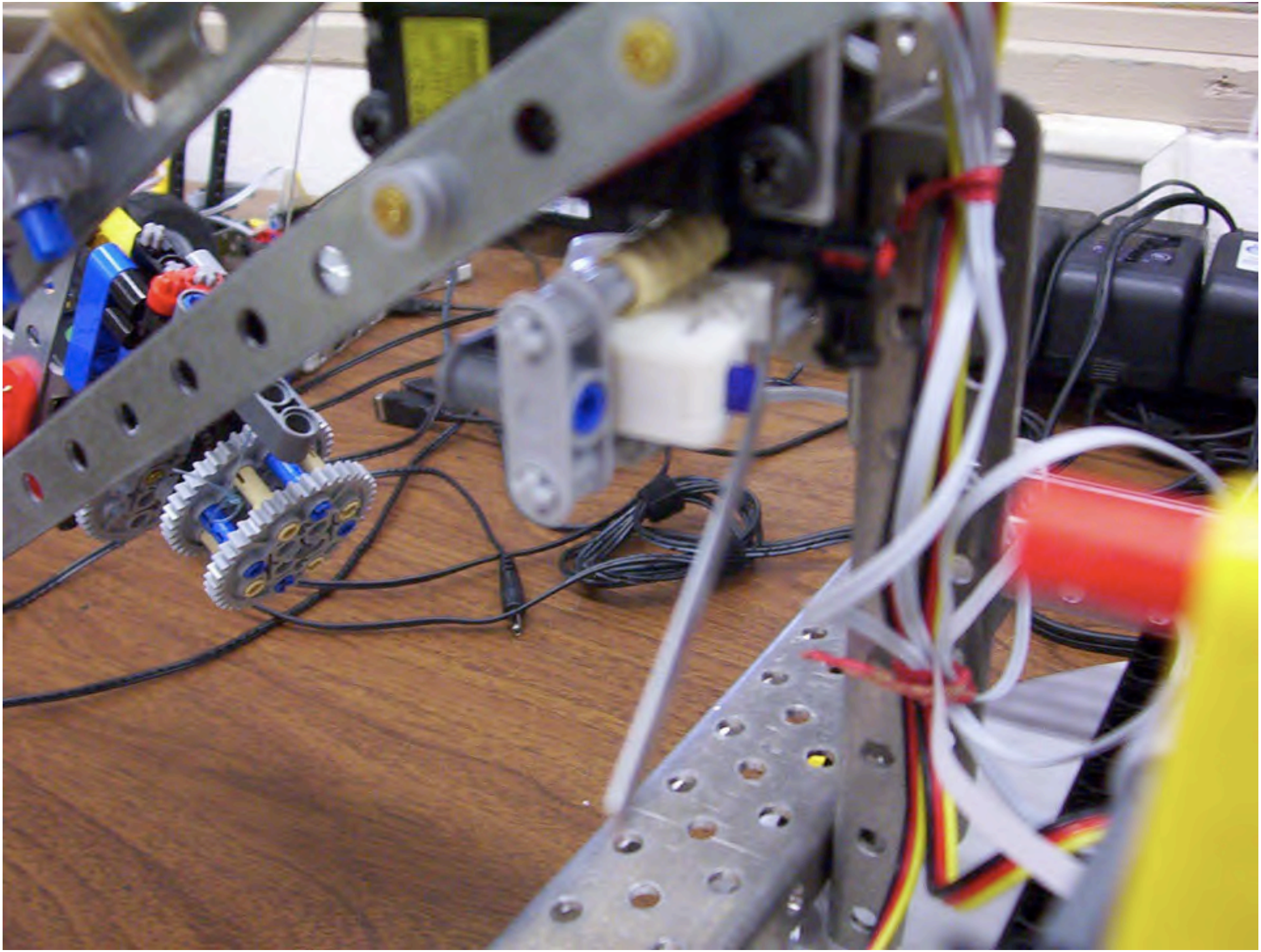

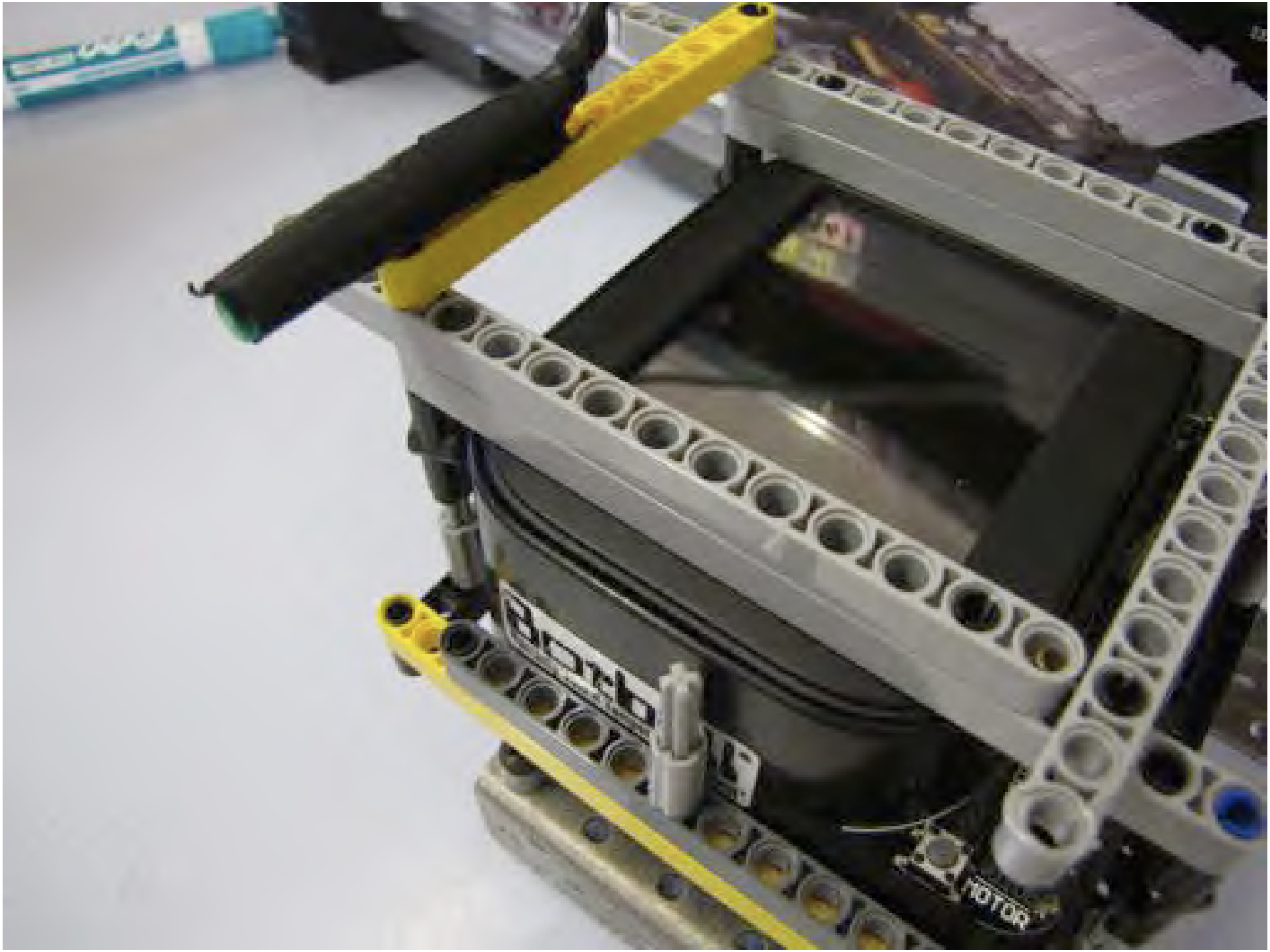
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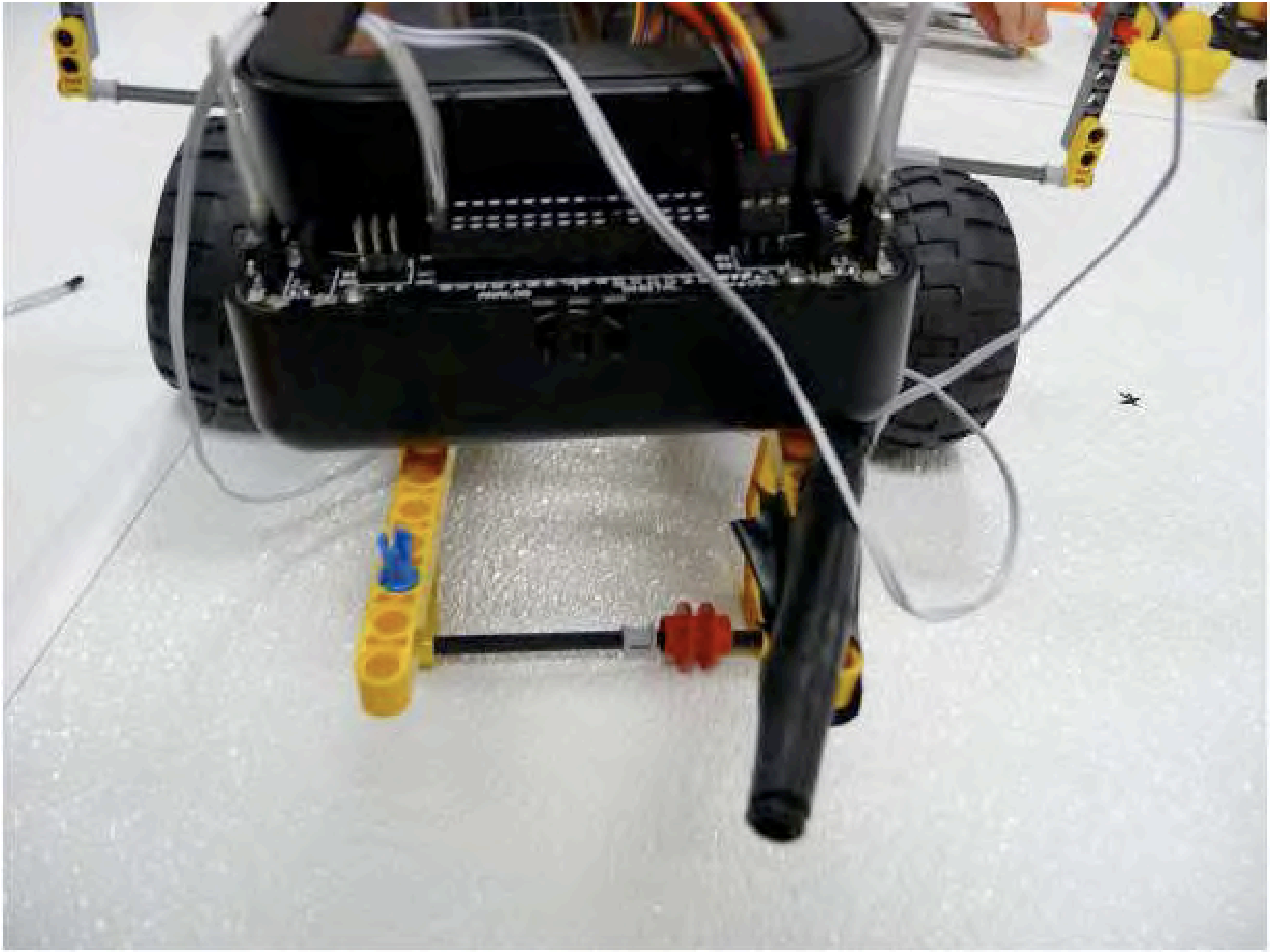
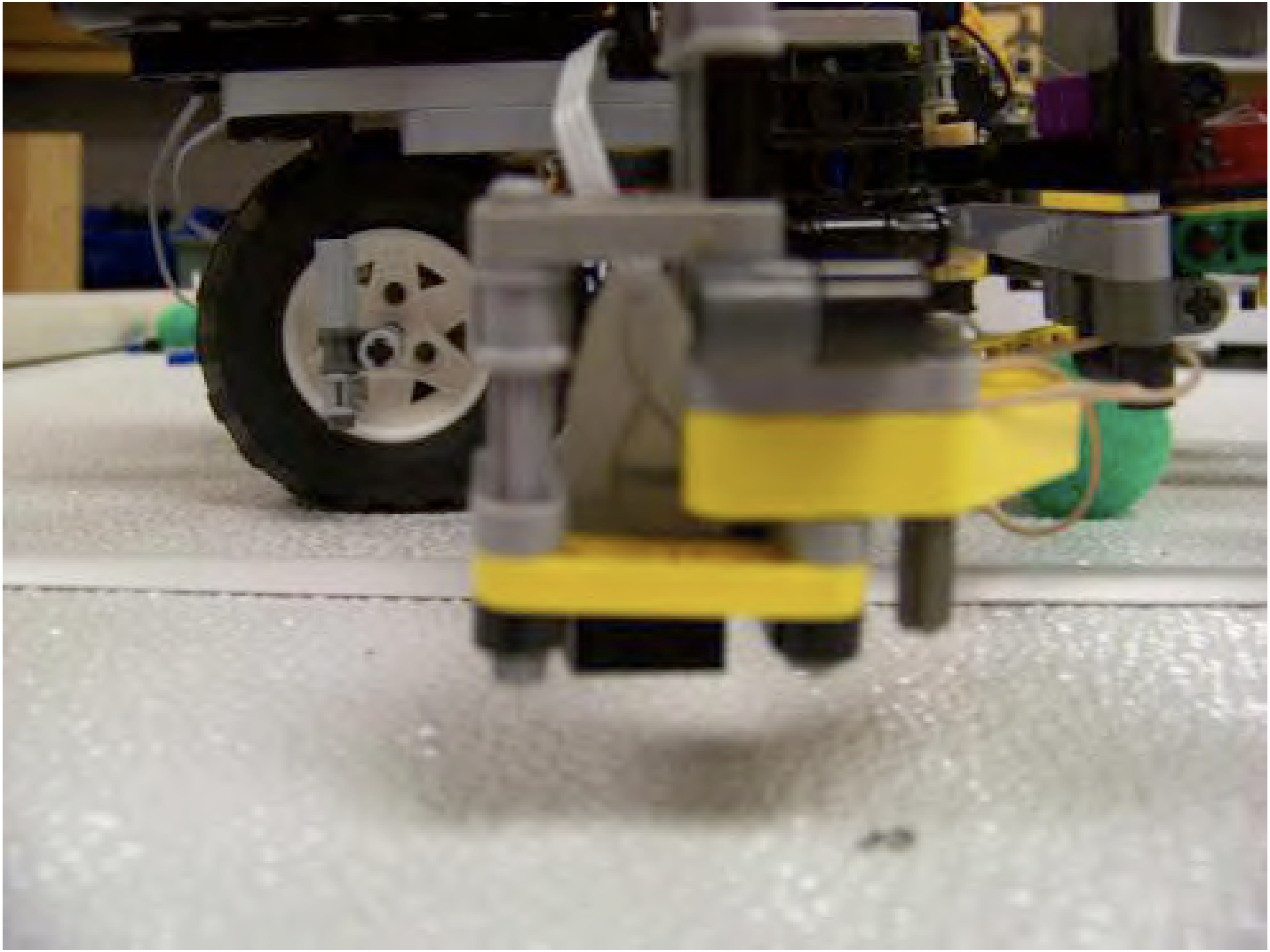
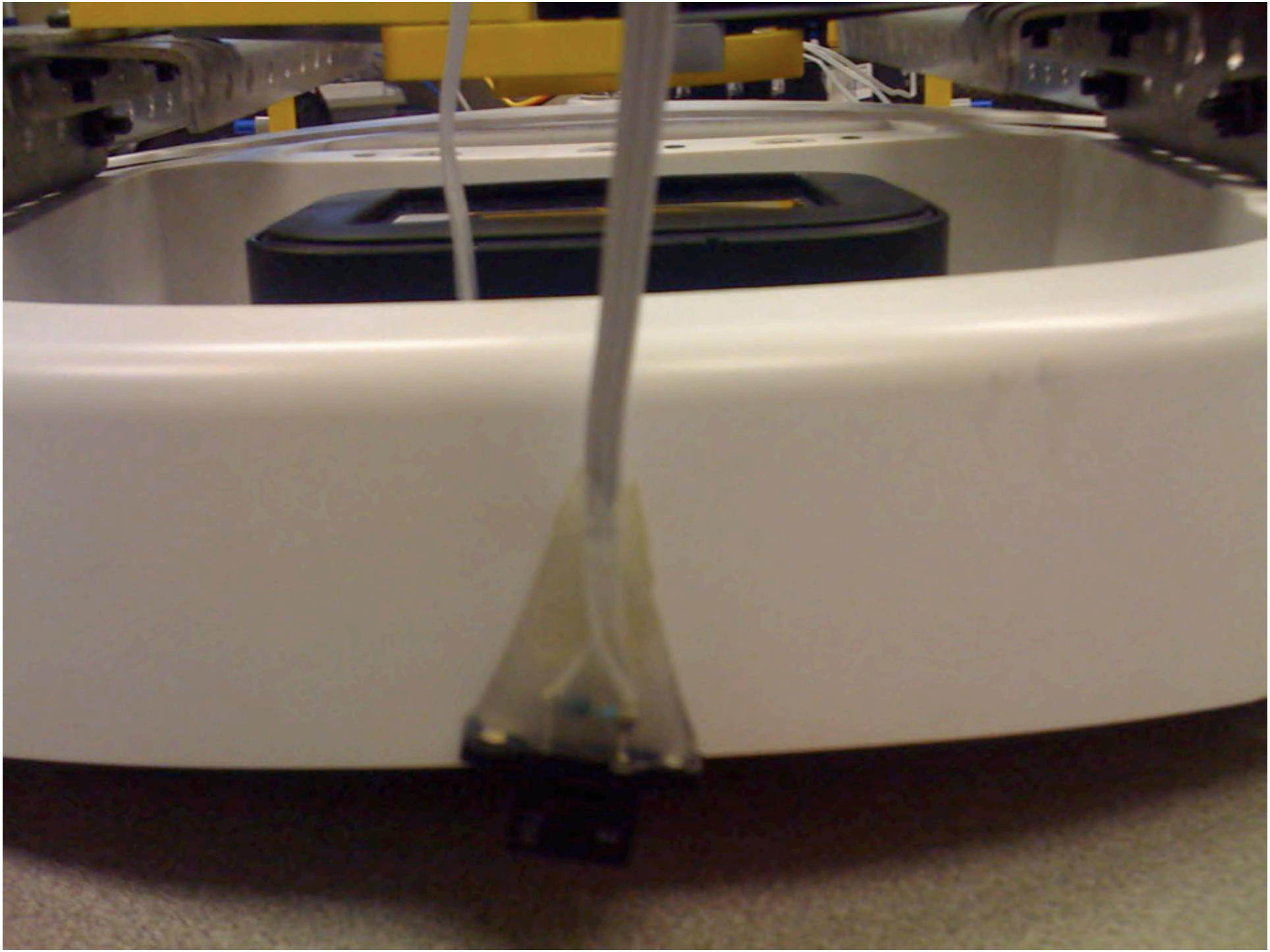
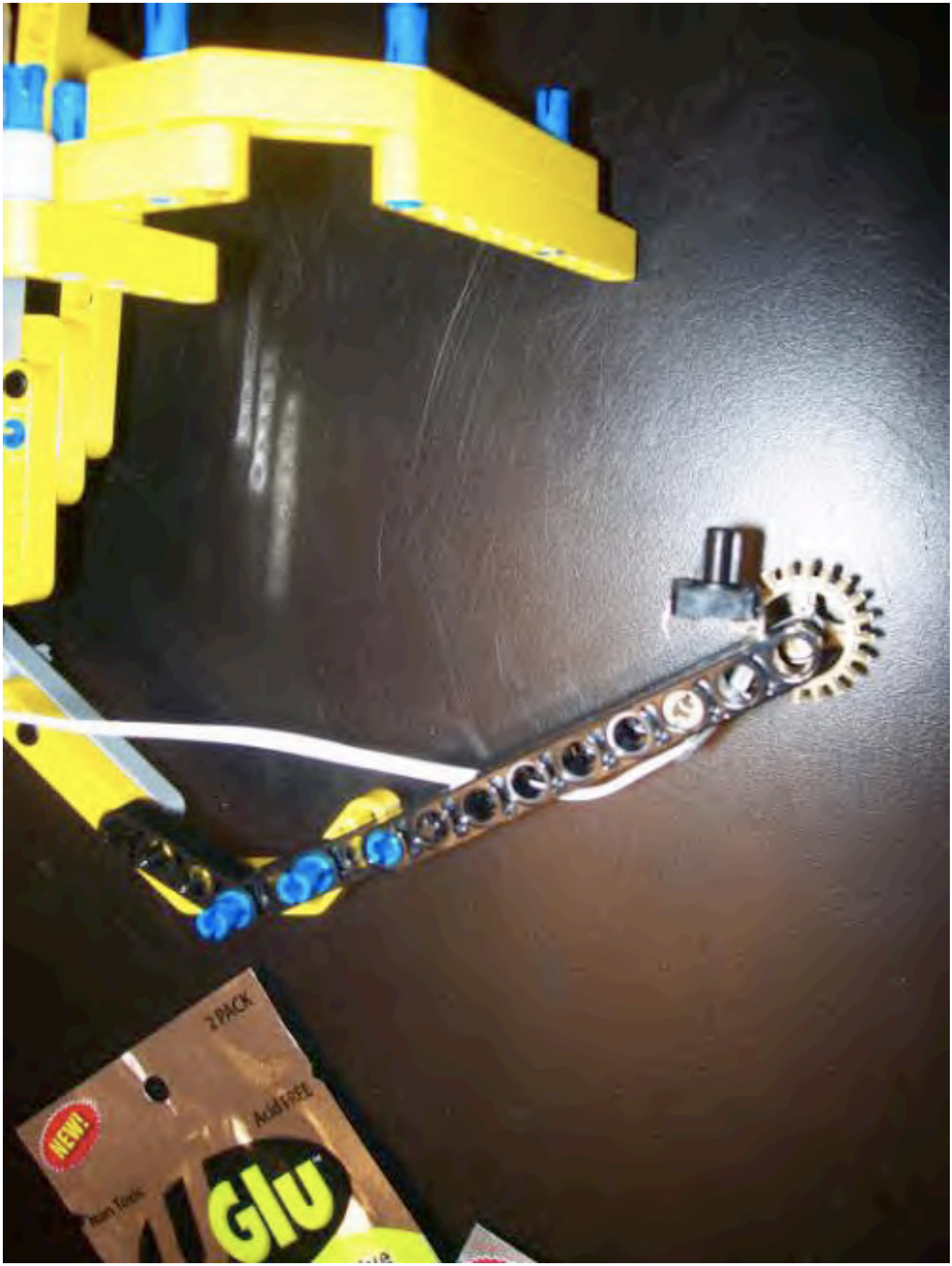
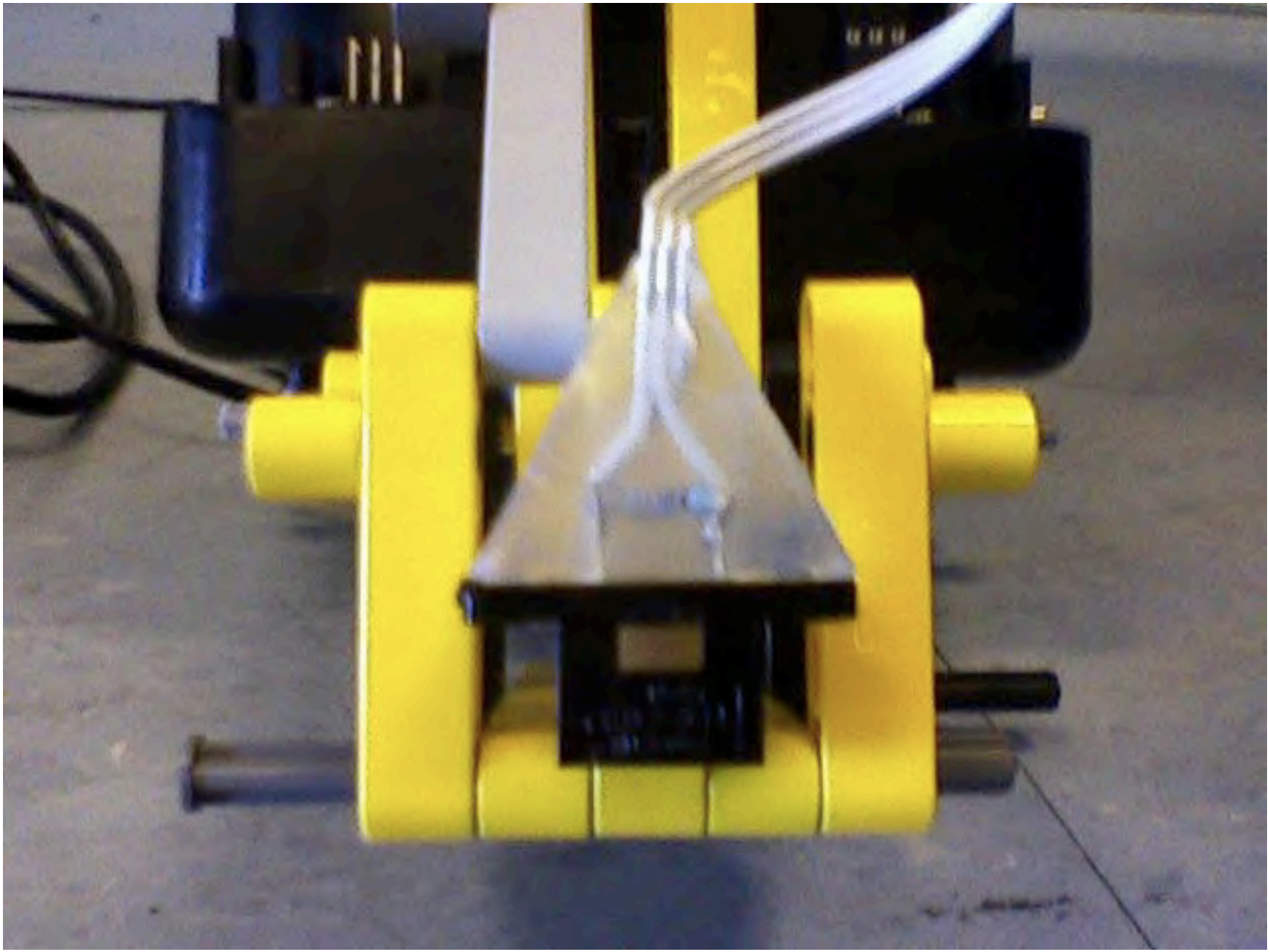







2 PACK
NEW!
Acid Free
Glu



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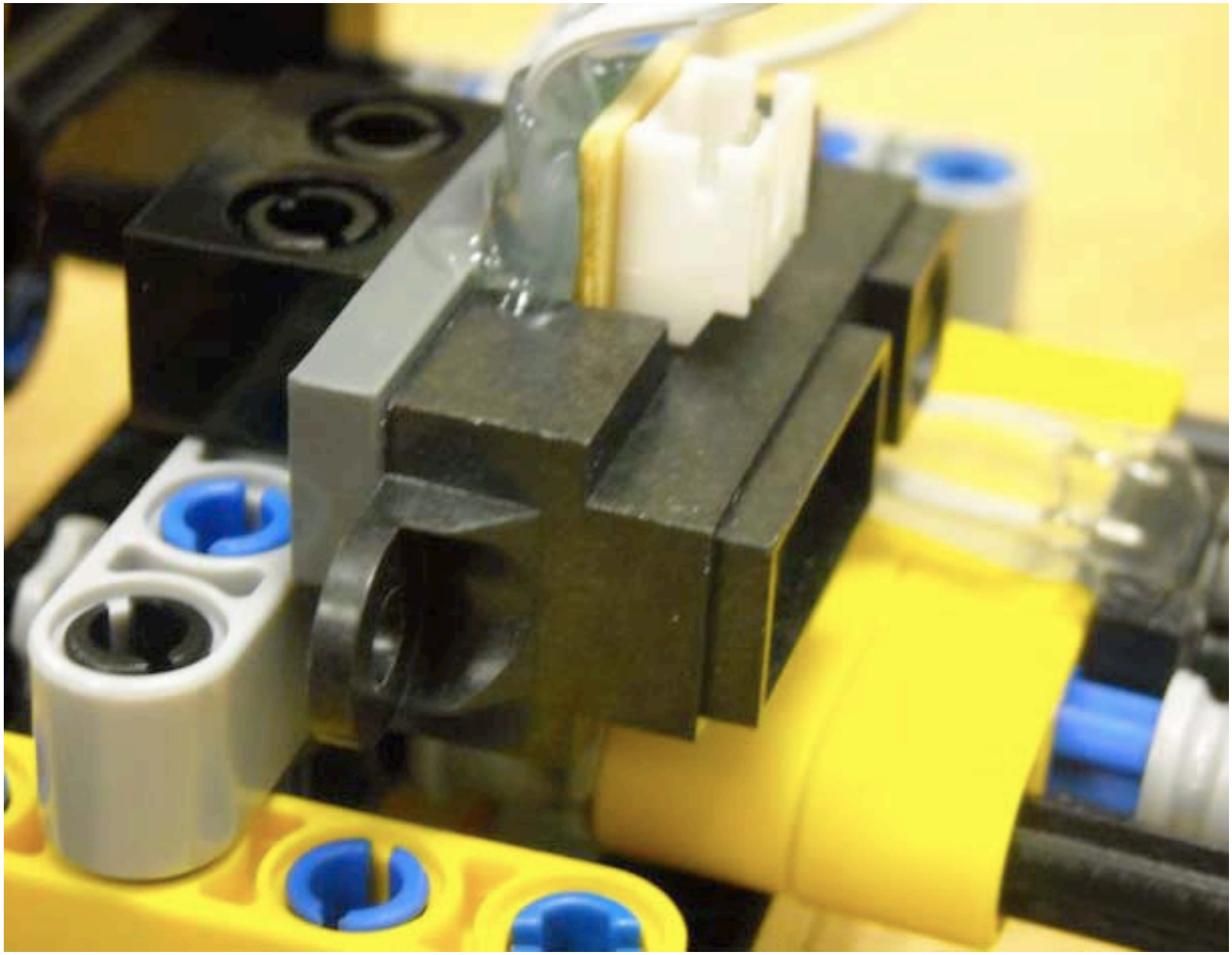

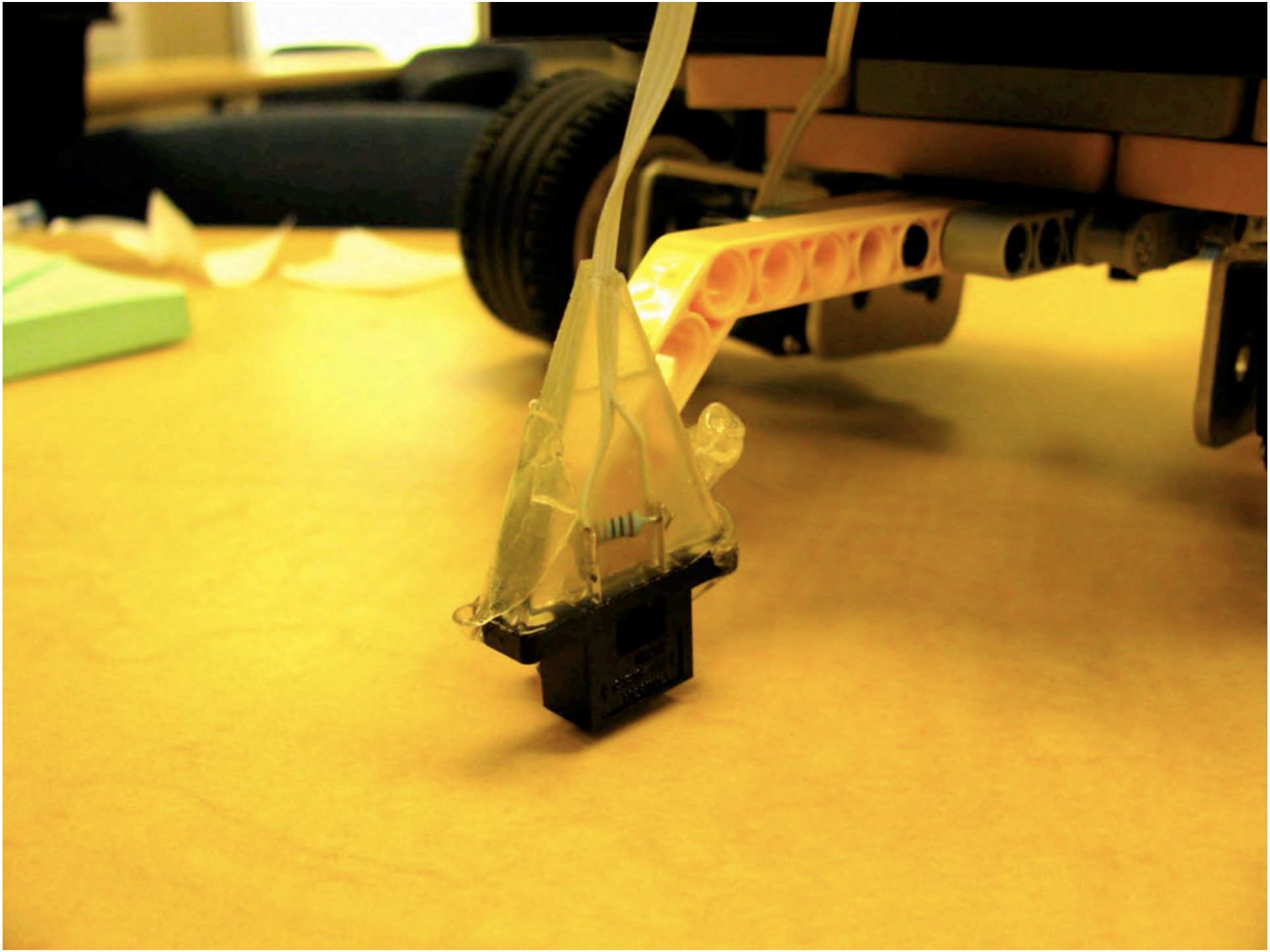

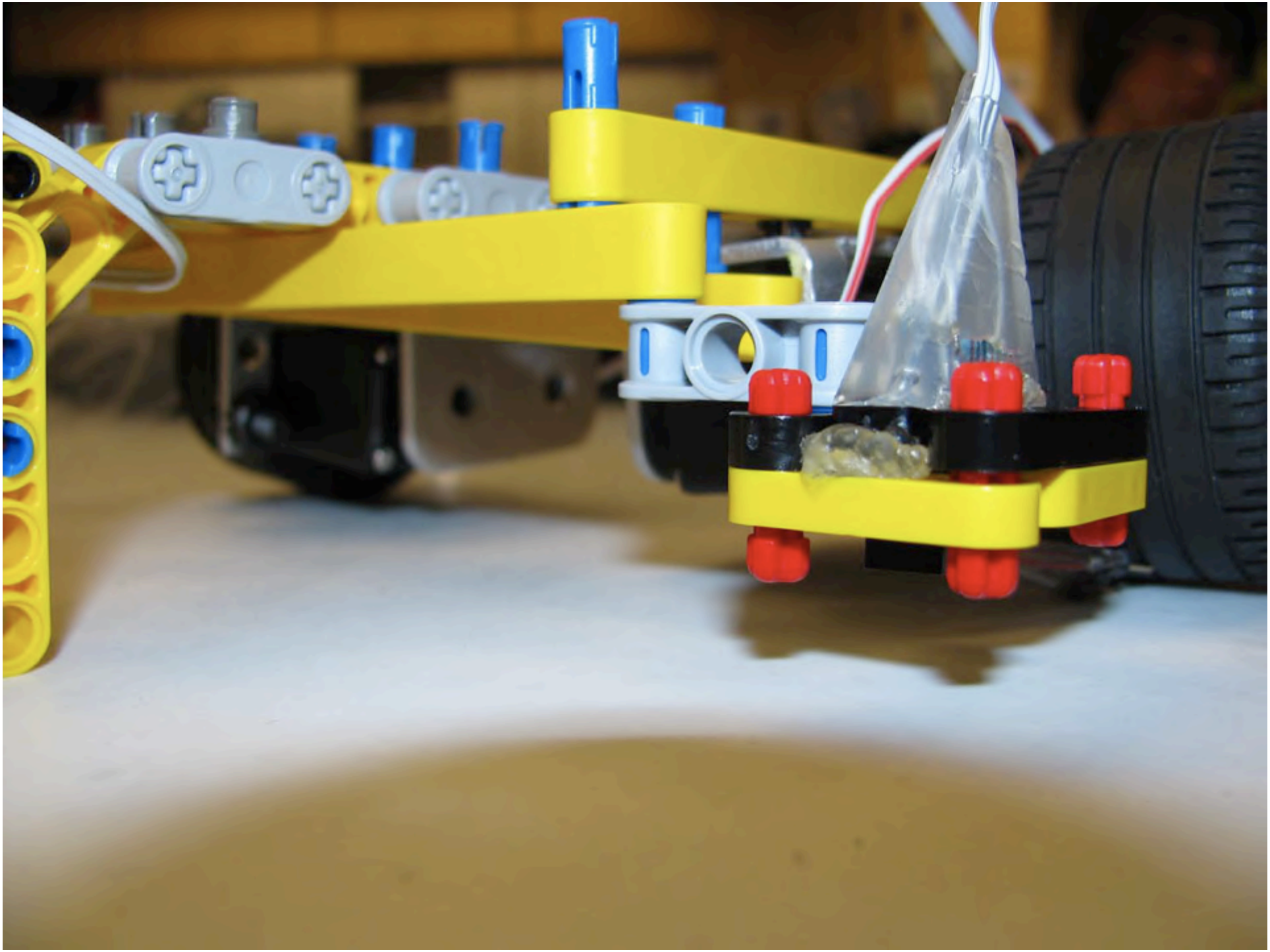

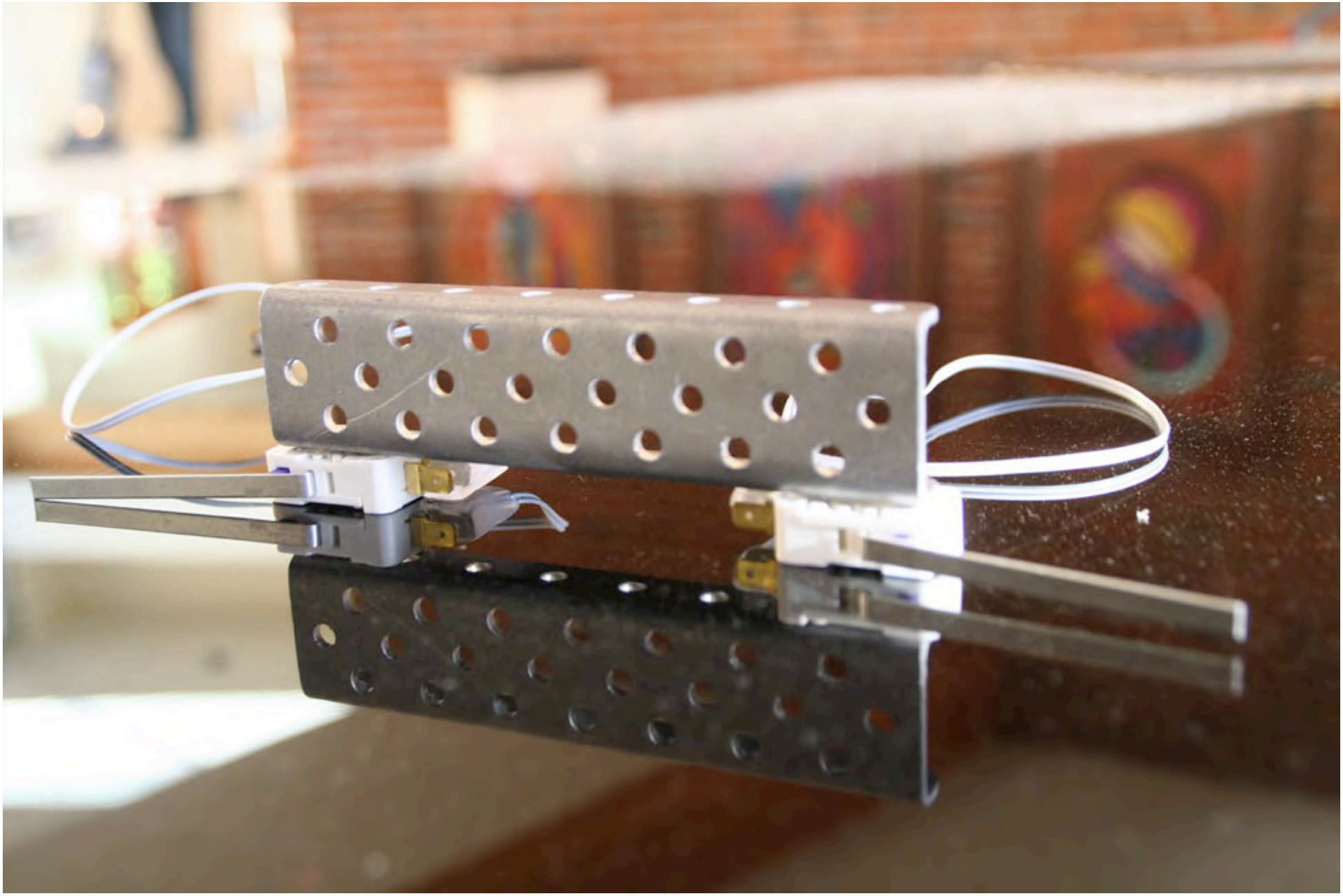

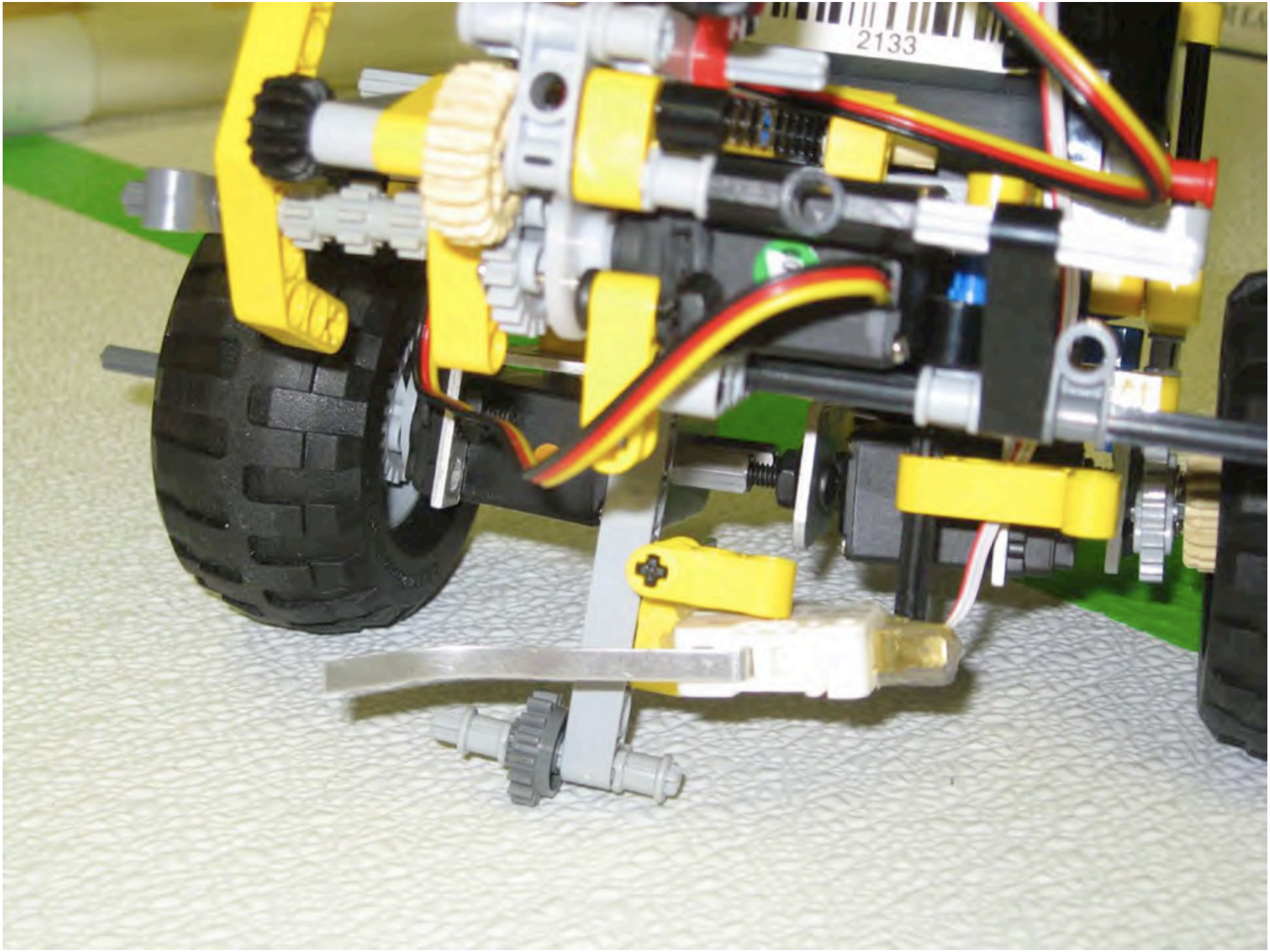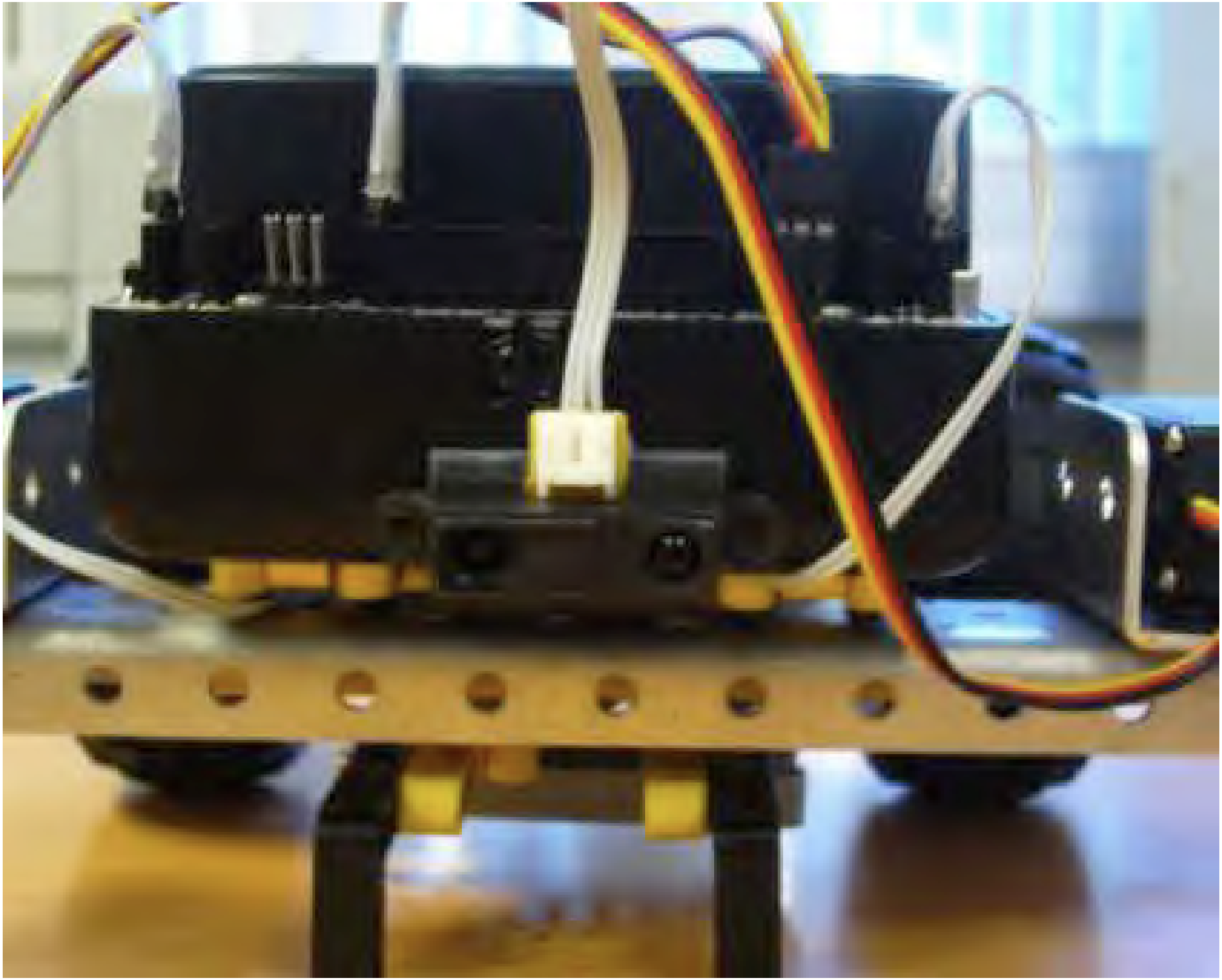
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