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Base Assembly

For CAD files found under Base folder in pr2_playpen/hardware

1. Take the 54” 80/20 piece and cut into the following lengths
    a. (1) piece at 15.75”
    b. (1) piece at 37.6”
2. Take one 93” 80/20 piece and cut into the following lengths
    a. (2) pieces at 36.5”
    b. (2) pieces at 8.27”
3. Take another 93” 80/20 piece and cut into the following lengths
    a. (2) pieces at 36.5”
    b. (1) piece at 15.75
4. Take the last 93” 80/20 piece and cut into the following lengths
    a. (2) pieces at 24”
    b. (2) pieces at 16.93”
    c. (1) piece at 10.27”
5. 3D print these parts.
    a. (6) pr2_ playpen_roller_fastener.sldprt
    b. (1) pr2_playpen_roller_fastener_back_left.sldprt
    c. (1) pr2_playpen_roller_fastener_back_right.sldprt
6. Lay the two 50” 80/20 pieces on the ground. We will build the base upside down initially.
7. Insert two rollers into the conveyor belt, one on each end. Also slide the rubber belt used by servo over the front roller and leave it free hanging.
8. Mount two 3D printed fasteners for the rollers (made in step 5a.) upside down on the outside of each 50” 80/20 piece with M6X15 screws. These fasteners should be mounted flush with the end of one side of the 80/20 piece (see Figure 1).

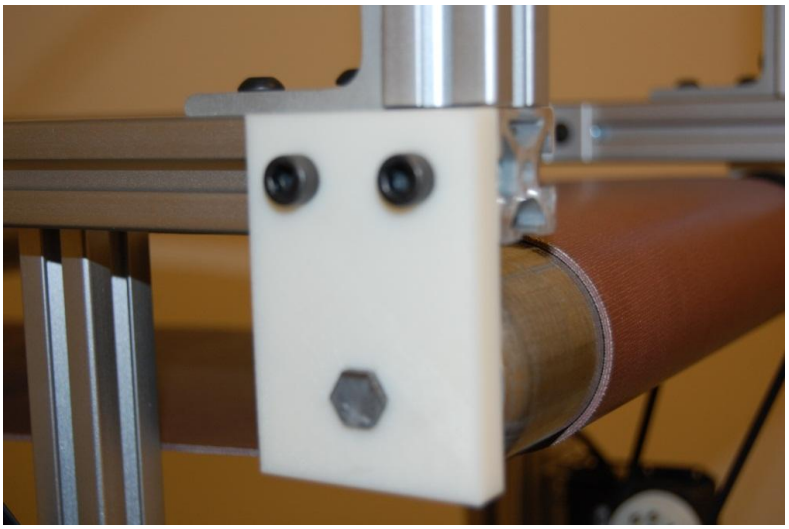


Figure 1 pr2_ playpen_roller_fastener.sldprt

9. Now take the back left and back right fastener 3D printed in step 5b and 5c and mount them on the other end of the 50” 80/20 piece. Make sure the tensioner hole is facing out as seen in Figure 2 and Figure 3.

Figure 2 pr2_playpen_roller_fastener_back_left.sldprt

Figure 3 pr2_playpen_roller_fastener_back_right.sldprt

10. Mount a 2 hole 80/20 corner bracket behind the back fastener with M6x12 screws. This will serve as the tensioner. Use M6x35 screws and single hole fasteners to join the back fastener to tensioning bracket as seen in Figure 4. Do this on both 80/20 pieces.

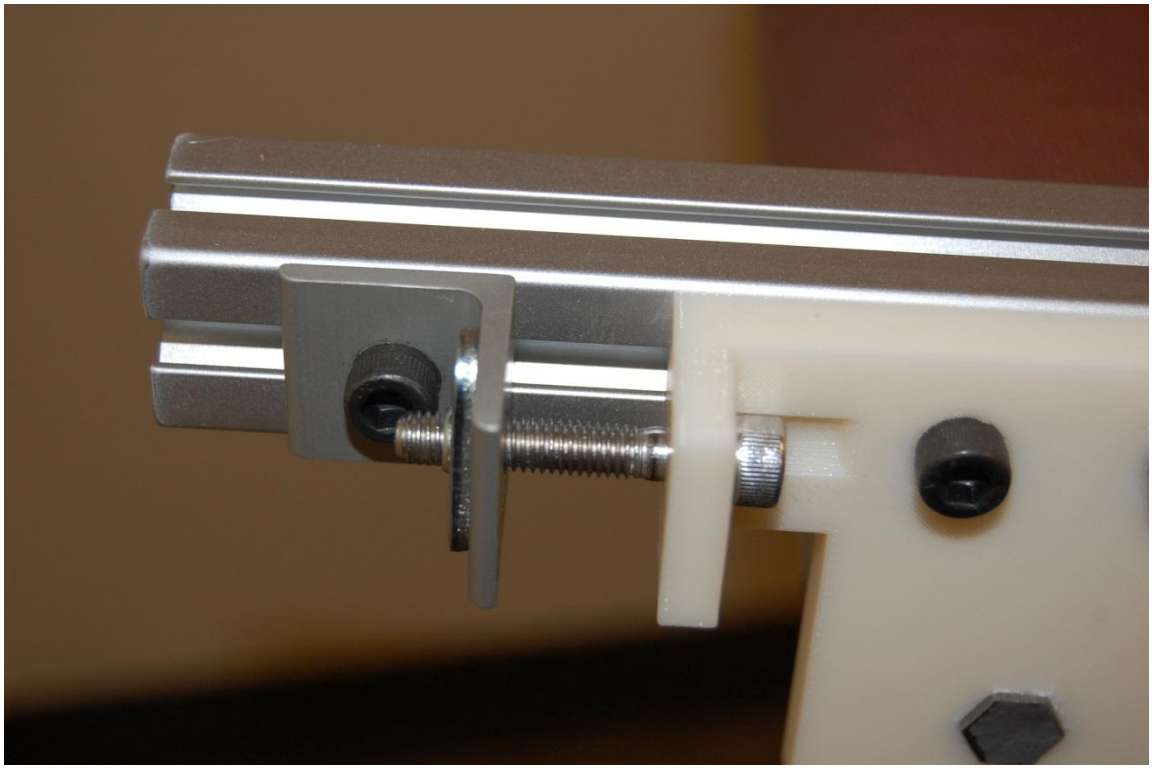


Figure 4 Tensioning mechanism for conveyor belt.

11. Make sure all the 3D printed fasteners are attached and extending towards the ceiling as the base is still being assembled upside down at this point.
12. Take the last two roller fasteners (step 5a.) and mount them in between the assembled rollers as seen in Figure 5. Use the base assembly CAD file for dimensions.

Figure 5 Completely assembled initial track with 4 rollers

13. Now take the 37.6” 80/20 piece and mount the two 24” 80/20 pieces perpendicular to so as to make an I shape. Each is attached with 2 hole 80/20 corner brackets, single hole fasteners, and M6x12 screws as seen in picture below.

Figure 6 I-shape piece of the base.

14. Take two 36.5” 80/20 pieces and mount them perpendicularly to the 24” 80/20 piece from the previous step with 4 hole corner brackets, double hole fasteners, and M6x12 screws. Repeat for the other end as well. Make sure they are spaced evenly apart from the middle. Dimensions can be found in the base assembly CAD file.

Figure 7 Supports to actually holed the conveyor belt at a given height.

15. Mount the two 8.27” 80/20 pieces in between the two 36.5” 80/20 pieces on each side with 2 hole corner brackets, single hole fasteners, and M6x12 screws (see).

Figure 8 Stabilizing support between two legs of structure.

16. Flip this sub assembly upside down and mount this to the conveyor belt subassembly. Mount with 2 hole corner brackets, single hole fasteners, and M6x12 screws.

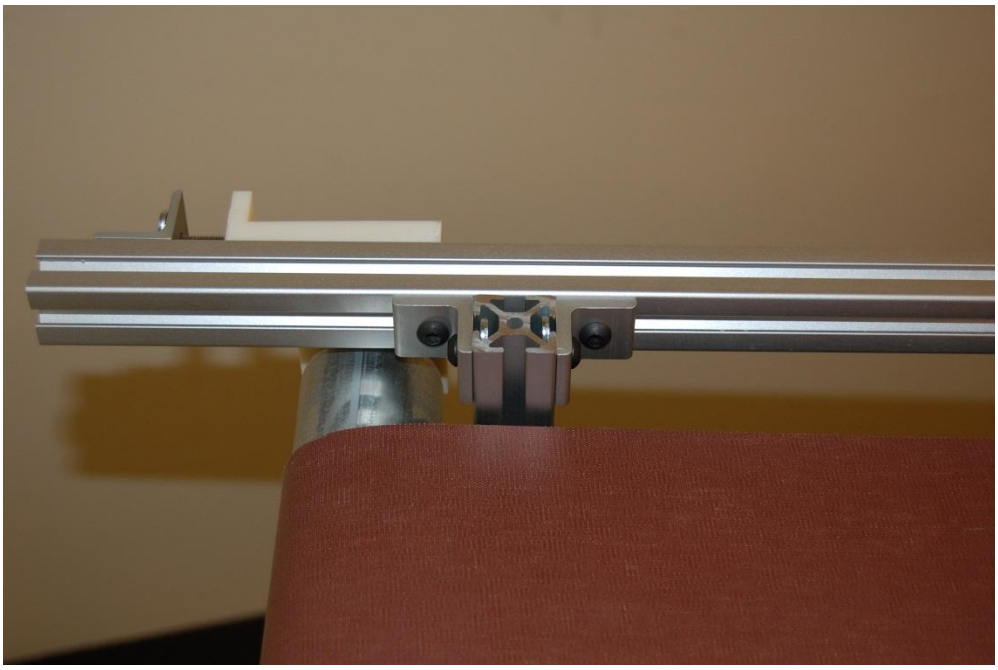


Figure 9 Connecting of the two sub-assemblies.

17. Take the two 16.93” 80/20 pieces and mount them vertically at the end near the front roller. Use 4 hole brackets, double hole fasteners, and M6x12 screws (see).

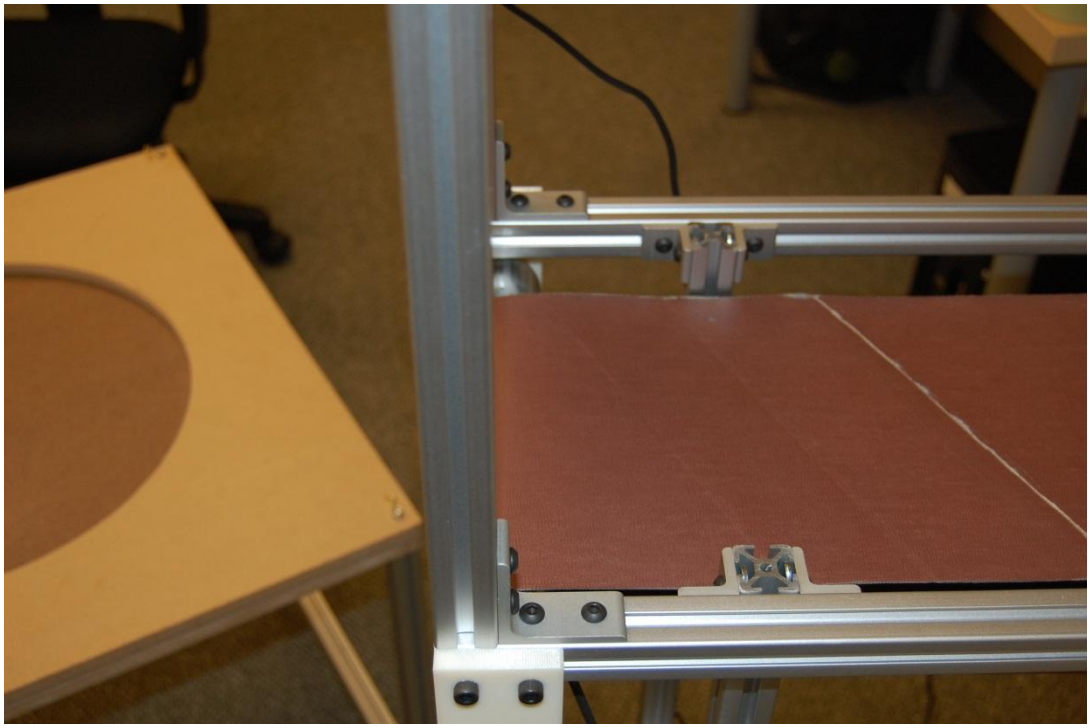


Figure 10 Upright pieces to hold Kinect mount.

18. Take the 10.27” 80/20 piece and mount in between the two vertical 16.93 80/20 pieces. Use 2 hole brackets, single hole fasteners, and M6x12 screws. Height can be adjusted to fit user needs and Microsoft Kinect controller can be mounted here with 3D printed bracket.

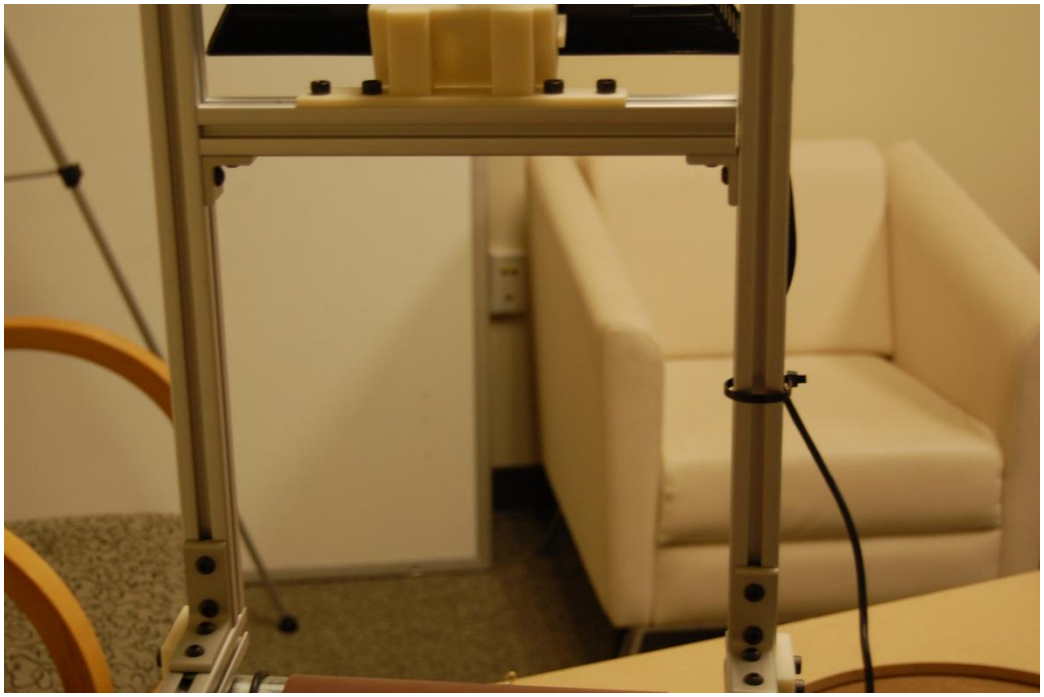


Figure 11 Finished support for Kinect sensor.

19. Take 90˚ aluminum stock and cut into servo bracket piece (servo_bracket.sldprt). This will serve as the bracket for the servo to attach to the vertical 36.5” 80/20 piece.
20. RX-64 Servo subassembly: 3D print servo horn (playpen_horn.sldprt) and attach to inside of servo. Mount the OF-64S bracket to the servo motor. Then mount the OF-64S bracket to the servo bracket (servo_bracket.sldprt) as shown below. Screws are provided in servo kit purchased from manufacturer.

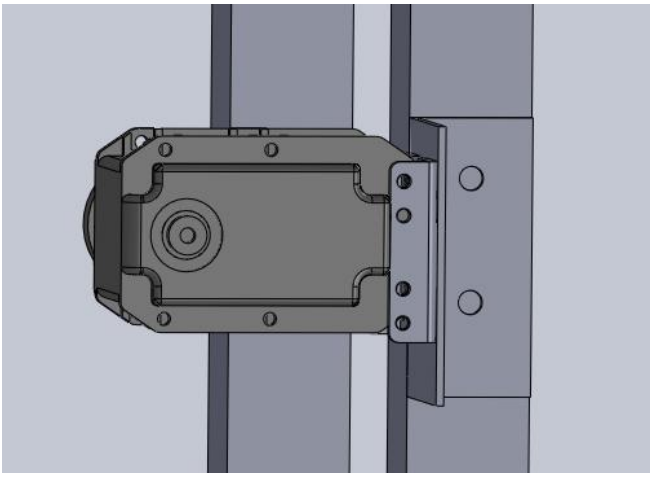


Figure 12 Servo mount and CAD model from the manufacturer.

21. Thread the free hanging rubber belt on the front roller to the servo horn and adjust height of servo assembly to desired tension. Mount the servo bracket to the 36.5” 80/20 piece with M6x15 screws.

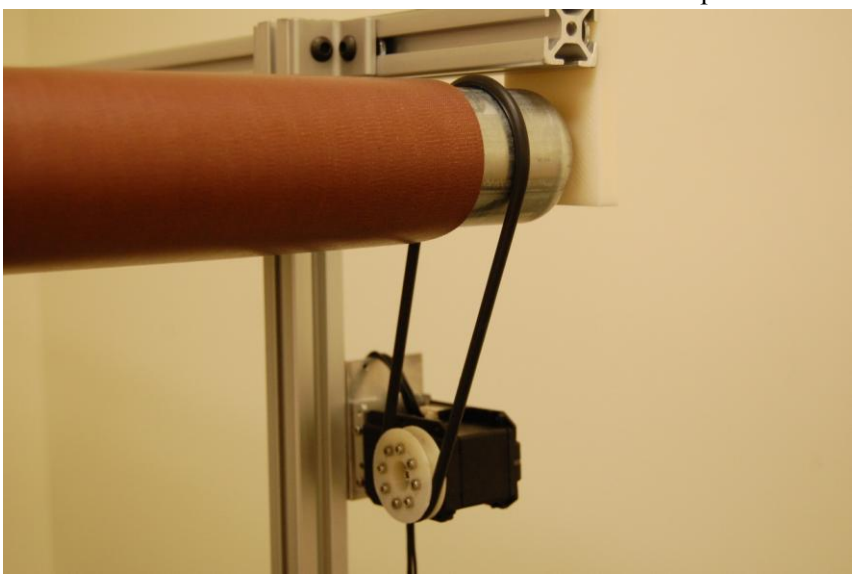


Figure 13 Robotis RX-64 attached to front roller using a simple belt transmission.

22. Take the last two 15.75” 80/20 pieces and mount them to a desired height on the 36.5” 80/20 for use as a shelf using 4 hole brackets, double hole fasteners, and M6x12 screws. We mounted a laser cut plastic piece with M6x12 screws to serve as the shelf.

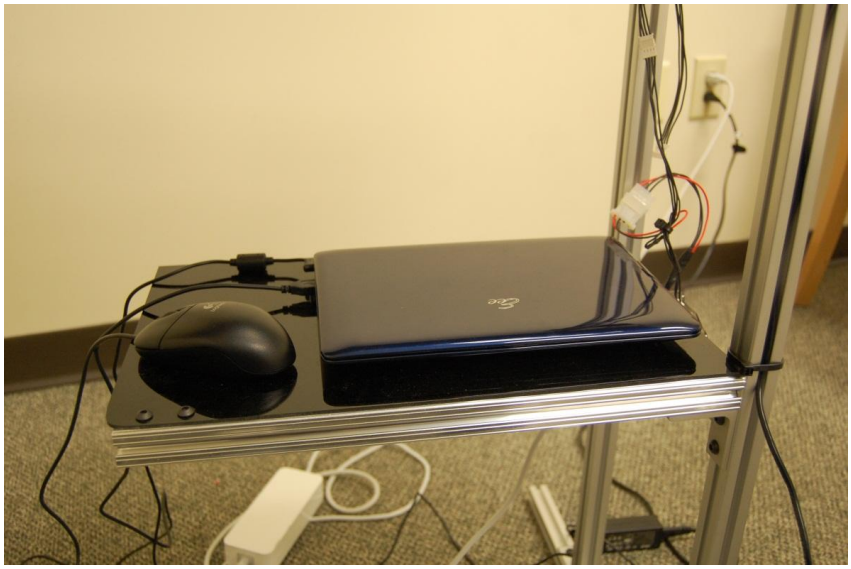
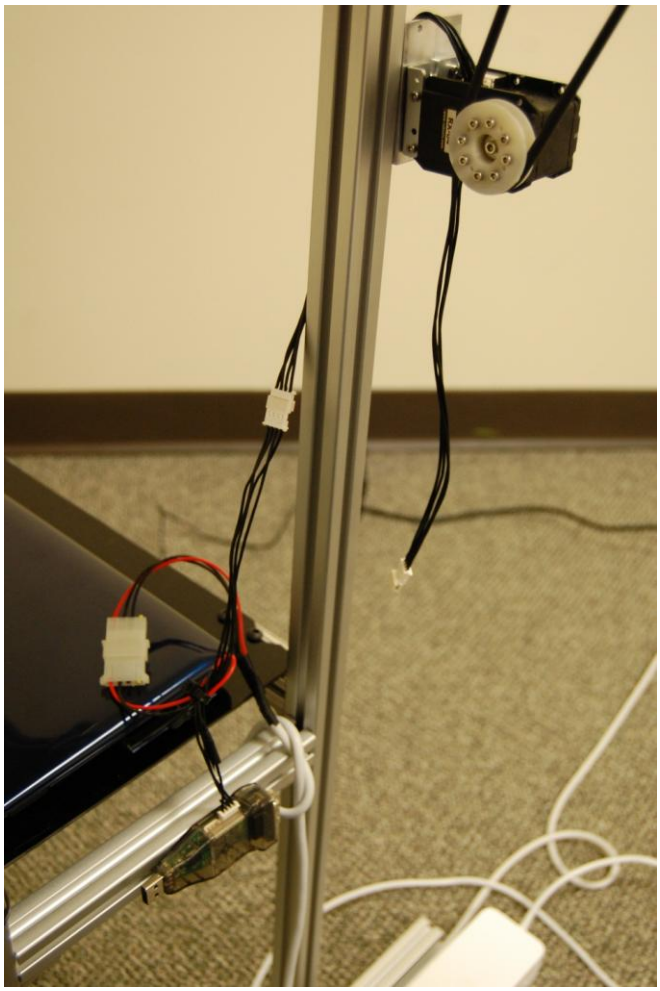


Figure 14 Shelf for EEPC that we use as a server to control the servos.

23. This is our assembly of the usb2dynamixel and 12 volt power supply in conjunction with the servo connection.



FINAL PRODUCT