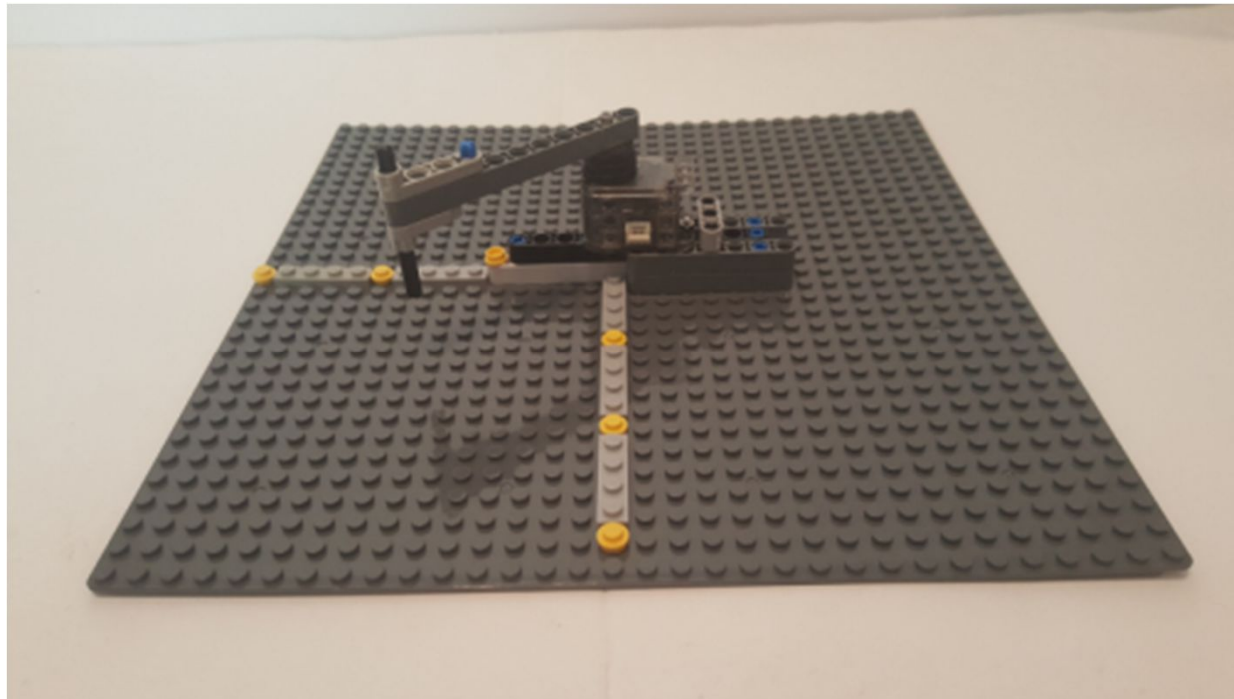


Dynamixel XL-320 1-DOF Planar Manipulator

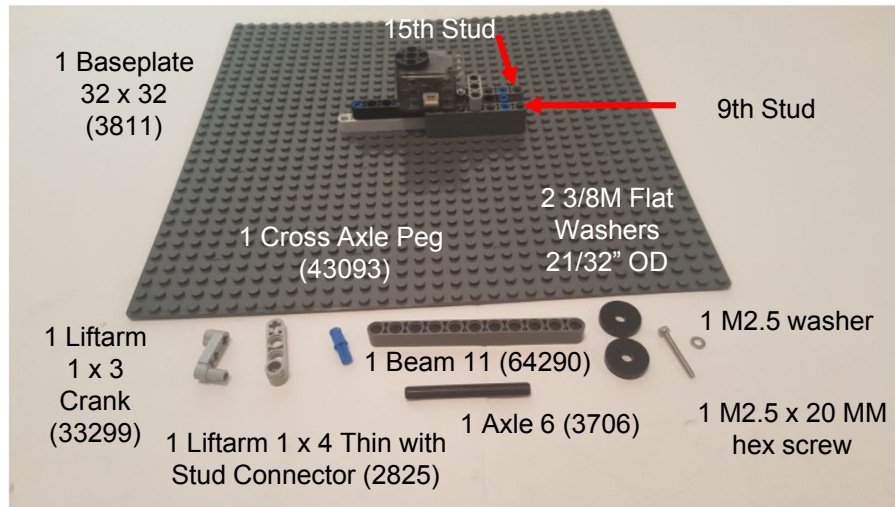
Preamble: Lego pieces adhere to a strict spacing, namely 8 mm between studs. This fact can be leveraged to easily measure lengths. Lengths are needed to kinematically define a robot manipulator's properties. Lego servos, like the NXT motor, have substantial backlash. By contrast, the XL-320 servo has little backlash and is significantly smaller and lighter than Lego motors. Using M2.5 fasteners, one can easily attach Lego parts to the XL-320.

Objective: Construct a 1-DOF planar manipulator with the XL-320 and Lego

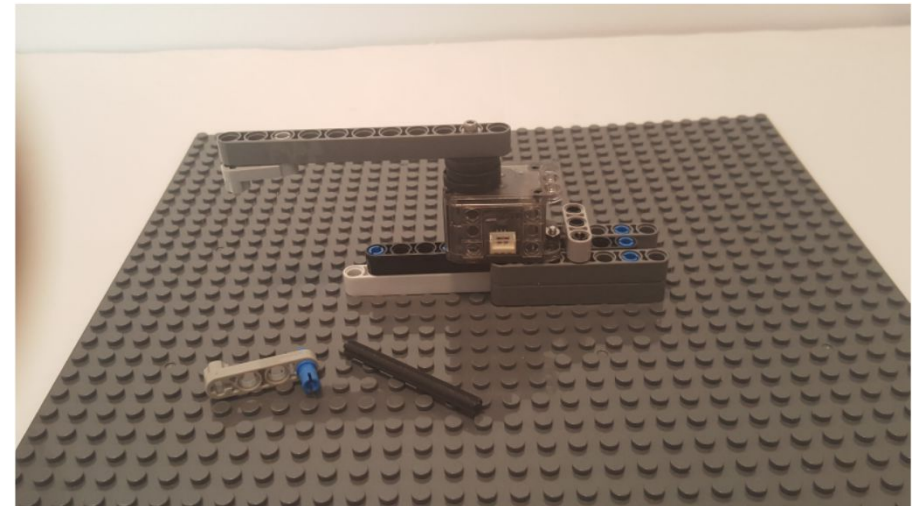


XL-320 Lego-based 1-DOF Planar Manipulator

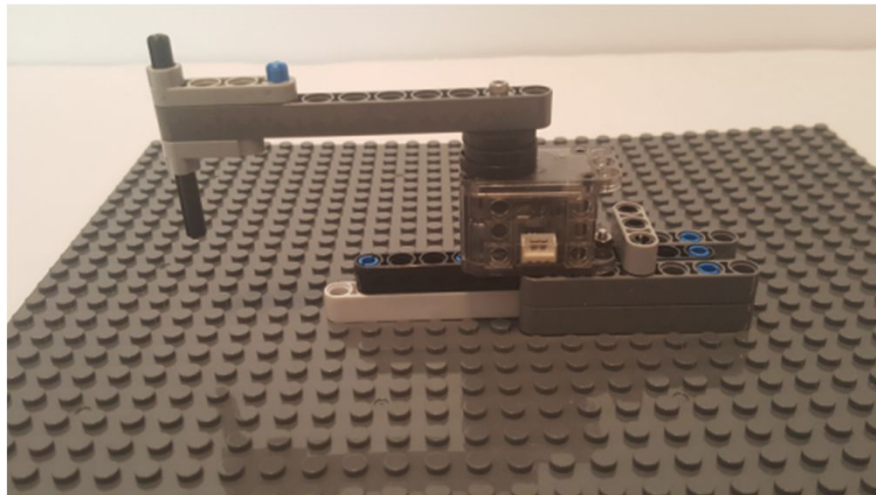
Step 1: Manipulator Arm to XL-320 Servo



1A: Attach Lego-based Servo Mount on Baseplate at location (red arrows). Gather components

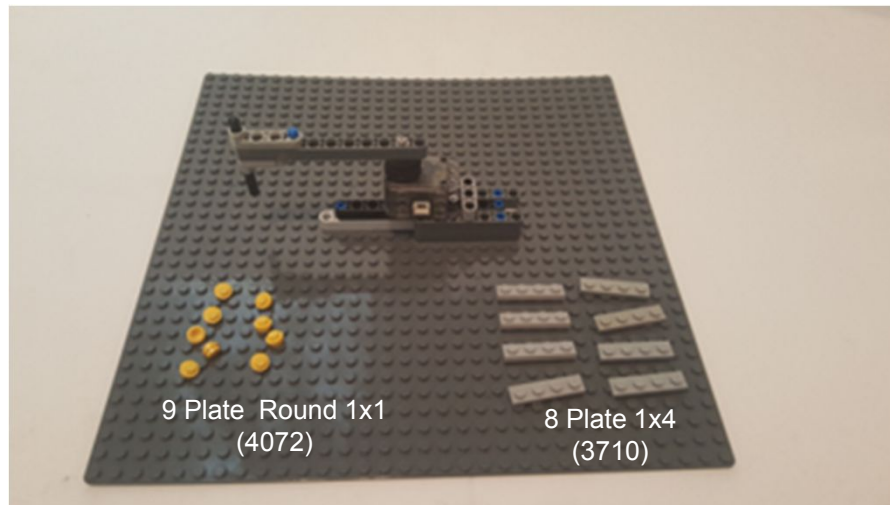


1B: Fasten M2.5 screw thru washer, Beam 11, 2 flat washers to XL-320 horn. Insert crank on Beam 11

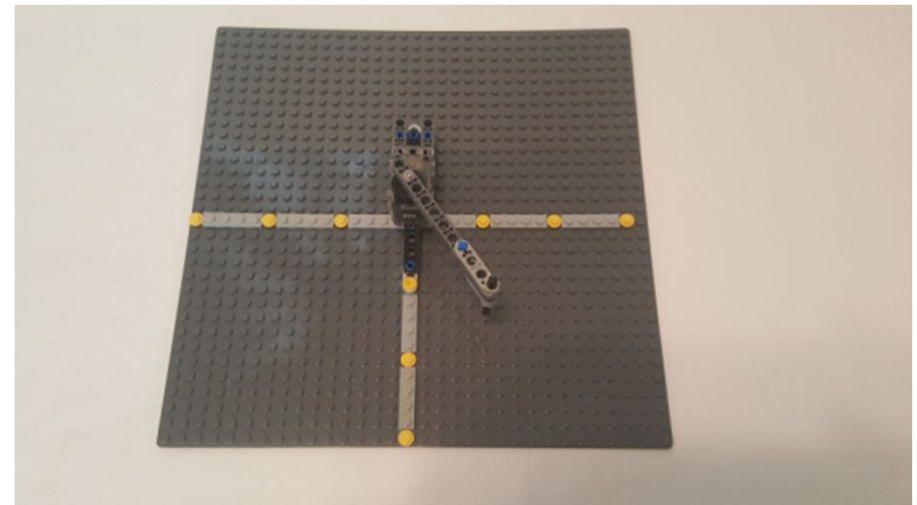


1C: Attach Liftarm 1 x 4 and secure with Axle 6

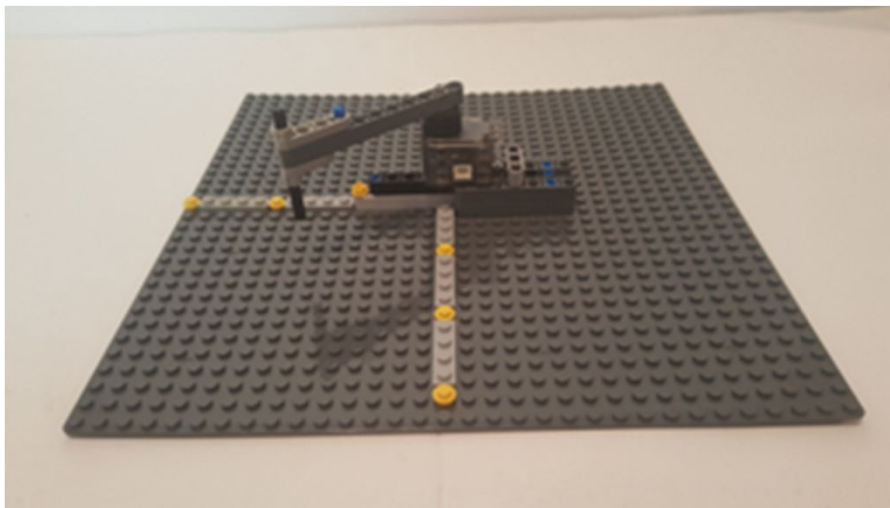
Step 2: Cartesian Planar Workspace



2A: Gather components to define Cartesian axes



2B: (Yellow) 1x1 Round Plates define 5-stud spacing. Insert them between 1x4 Plates.



2C: $\pm X$ axis is -15 to +15 studs. +Y axis is +15 studs

Congratulations! This is an XL-320 Lego-based 1-DOF planar manipulator. Studs are spaced 8 mm apart. The Cartesian workspace will help test the manipulator's positioning accuracy