

WE-R2.4 Six-Axis Robot Arm



LoboCNC

[VIEW IN BROWSER](#)

updated 10. 10. 2023 | published 10. 10. 2023

Summary

This robot arm is (very) roughly styled as an 80% scaled version of the UR3 industrial robot. It uses the same design...

[Learning](#) > [Engineering](#)

Tags: [robotarm](#) [thingiverse](#)

This robot arm is (very) roughly styled as an 80% scaled version of the UR3 industrial robot. It uses the same design philosophy of simply placing a motor/reducer actuator unit at each joint, with six actuators stacked up to make a 6-axis arm. Now while the UR3 uses hollow torque motors coupled with harmonic drives (\$\$\$) for the actuators, this robot uses the stepper motor/compound planetary actuators I posted here: <https://www.printables.com/model/132262-robot-actuators>. Two of the large actuators get used for the first two base joints, one of the medium sized actuators gets used for the elbow joint, and three of the small ones get used for the wrist joints. And the gripper* I've posted here: <https://www.printables.com/model/132264-conformal-robot-gripper>.

For the controller, I've used seven of Pololu's Tic T500 stepper controllers with custom firmware I wrote to support coordinated motion. You can find the gory details, including a Windows test utility program, here: https://drive.google.com/open?id=1rKRuWC4jAOekrds_WGUC7DkwIVsk2zdb

This is very much a work in progress and I'll be filling in the holes as I get time. In the meantime, please feel free to post questions in the comments section if you need details I haven't gotten to yet. Please read through all of the material here and ask me any questions you have before starting to build this - it is not an easy weekend project!

And here is an excellent video posted by jlauer of his make of the arm:

<https://www.youtube.com/watch?v=tEbjV32GyYU>

And another by jlauer with the development of his custom controller

board: <https://www.youtube.com/watch?v=RdmdFIhCo4M>

*The gripper shown in the video is slightly different than the one posted.

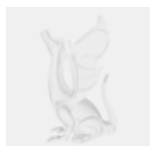
For anyone interested in participating in the continued development of this robot, Thingiverse user jlauer has set up a discussion forum: <https://forum.makerforums.info/c/ChiliPeppr/robot-arm>

UPDATE: I've just posted an anti-backlash version of the small wrist actuator that has greater torque, less backlash and runs more smoothly:

<https://www.thingiverse.com/thing:3566678>

Category: Engineering

This remix is based on

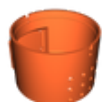


None

Model files



upperarm_short.stl



shouldershell.stl



shoulderplate.stl



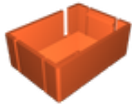
elbowcap.stl



wristshell.stl



ticbase.stl



ticbasecover.stl



basecone.stl



upperarm.stl



forearm.stl



arm.step



wristcap.stl



elbowshell.stl



shouldercap.stl

[Find source .stl files on Thingiverse.com](https://www.thingiverse.com)

License ©

This work is licensed under a
Creative Commons (4.0 International License)



Attribution—Noncommercial—Share Alike

-
- ✗ | Sharing without ATTRIBUTION
 - ✓ | Remix Culture allowed
 - ✗ | Commercial Use
 - ✗ | Free Cultural Works
 - ✗ | Meets Open Definition