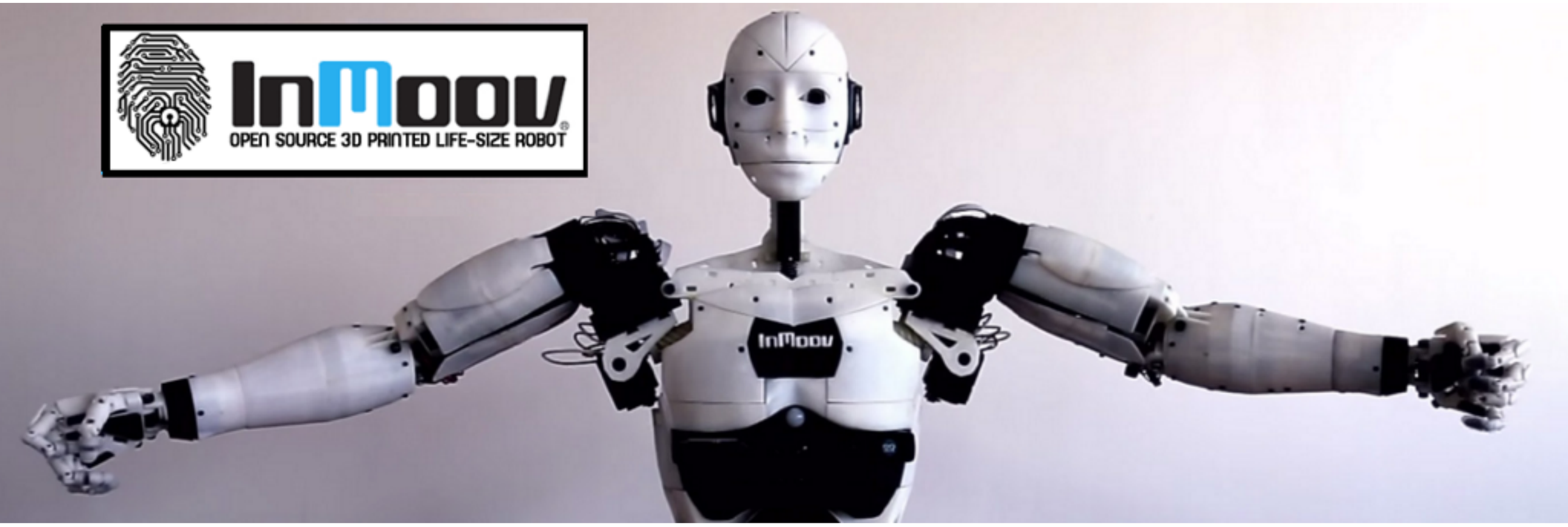
Construction and Control of InMoov

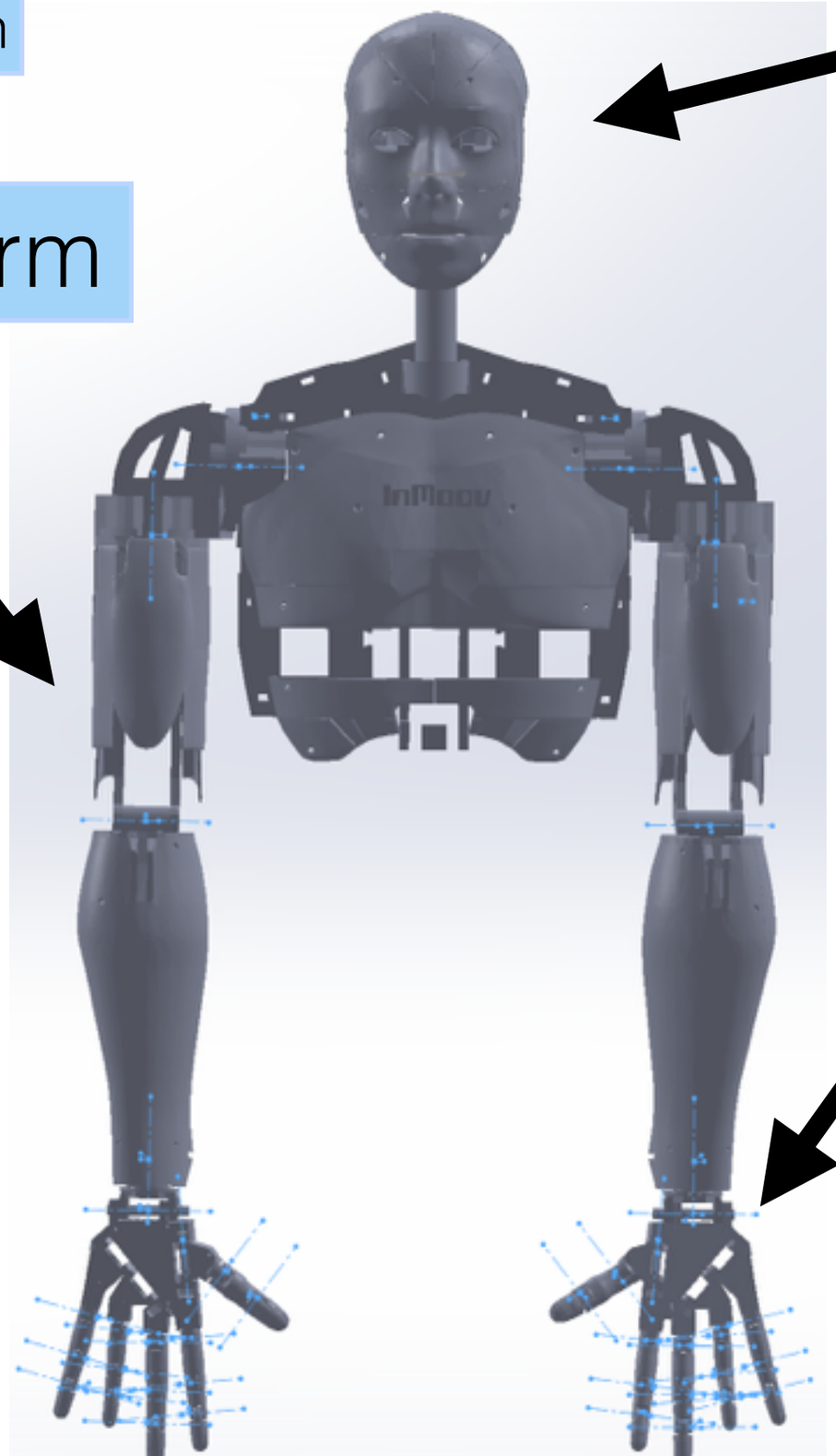


Overview

Designed by Gael Langevin

2x Camera

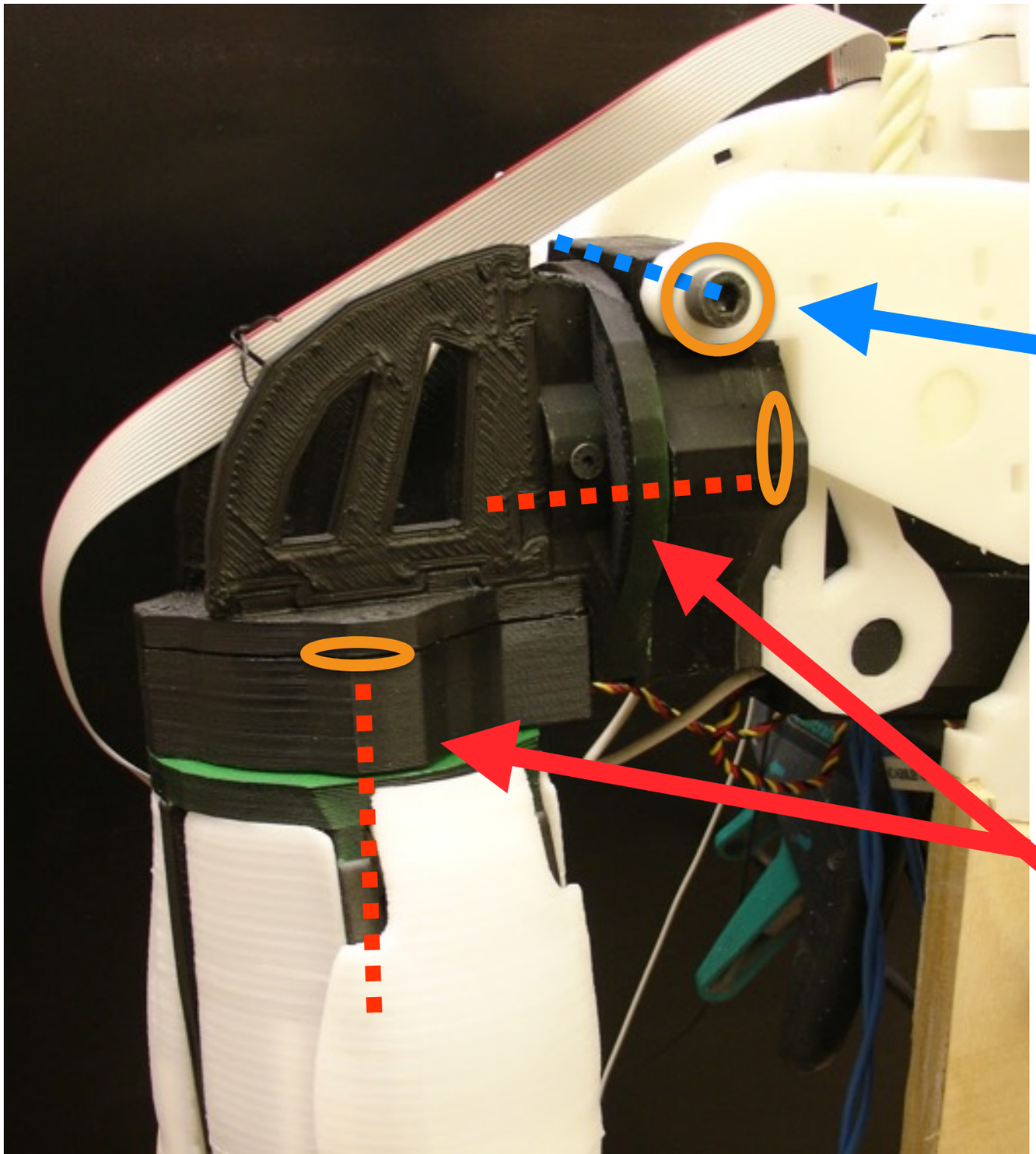
5 DOF in each arm



16 DOF
in each hand

3D printed

Upper & Lower Shoulder



Upper Shoulder

Worm Gear Mechanism
Moves arm up & down

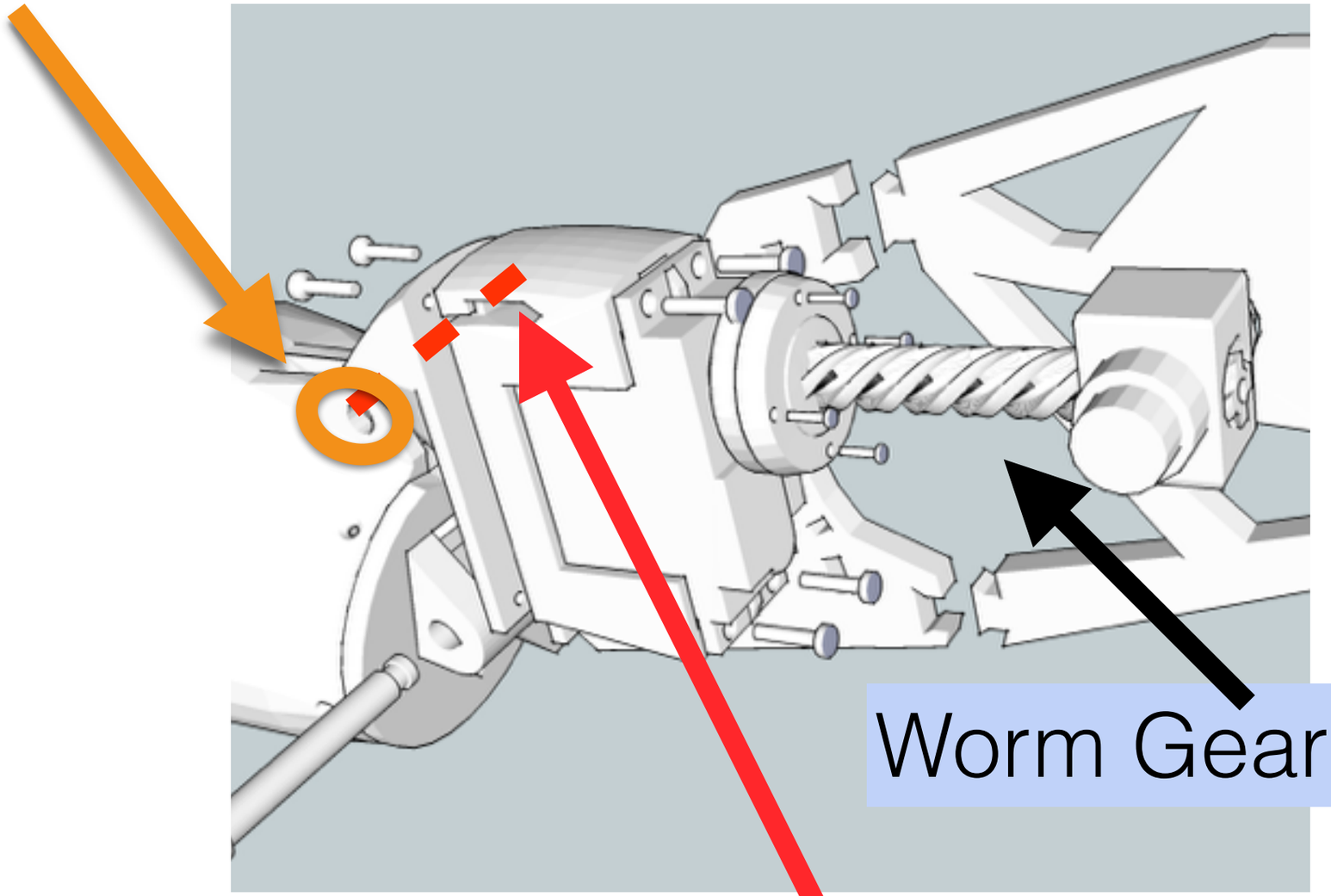
Lower Shoulder

Worm Transmission Drive
Rotates arm in 2 axis

Bicep

External Potentiometer

Actuates from 0° to 90°

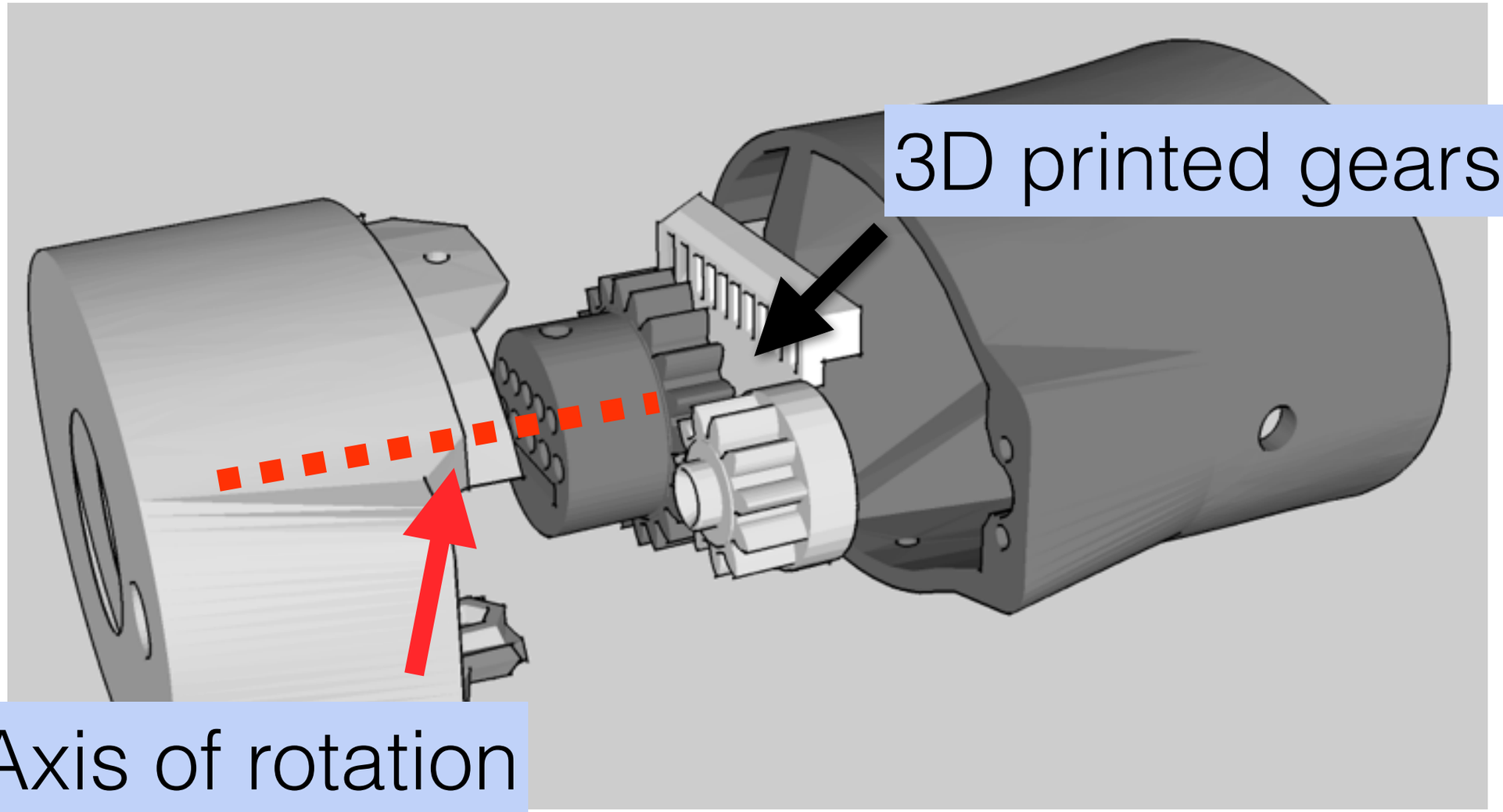


Worm Gear Mechanism

Axis of rotation

Wrist

Servo: MG996 - 0.19N.m

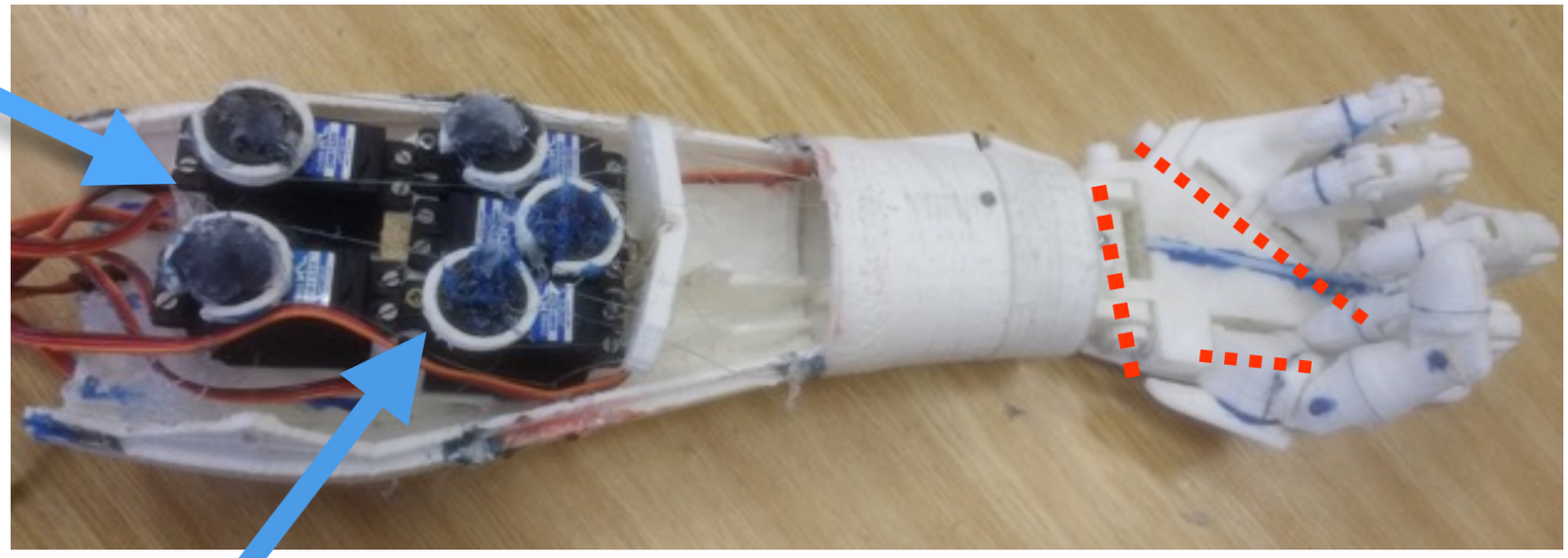


Rotates from 0° to 45°

Hand

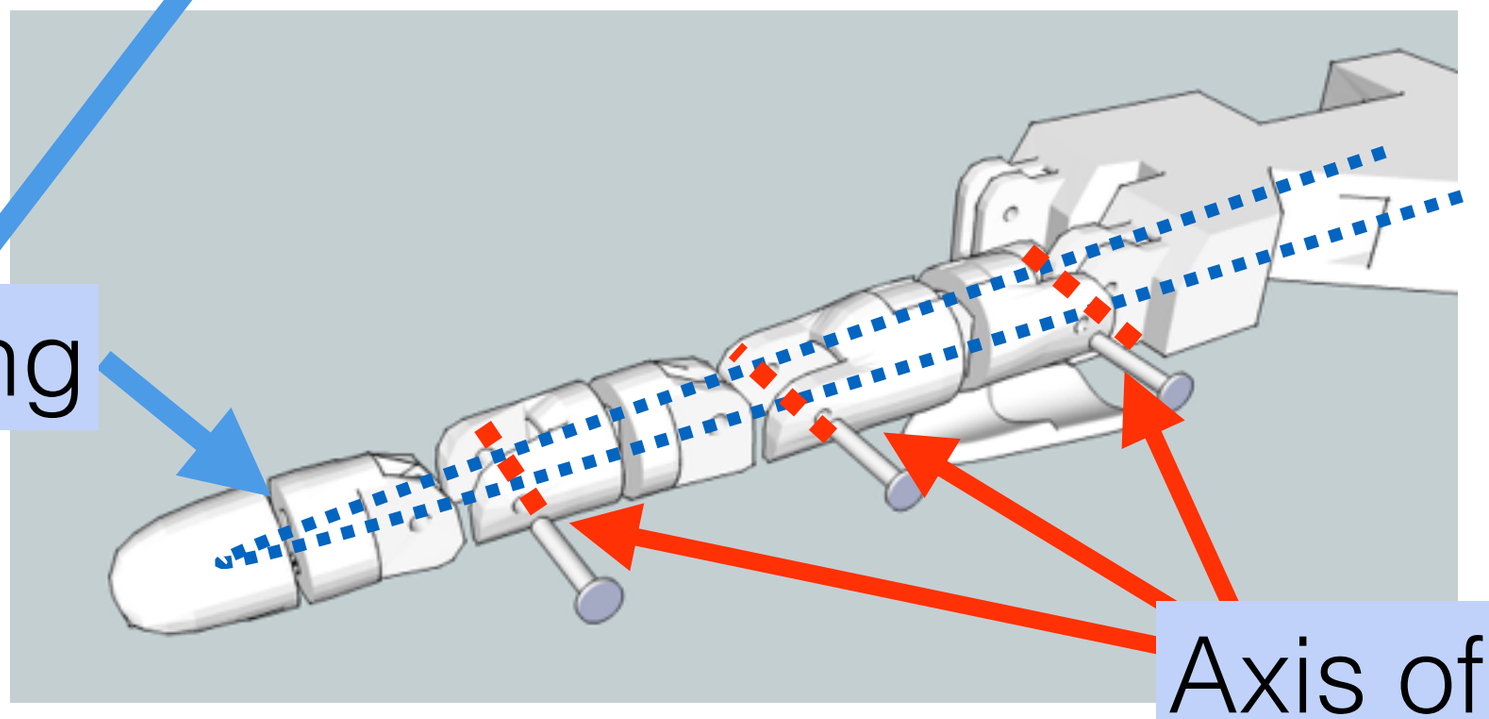
Servos: MG996

3 joints per finger



6

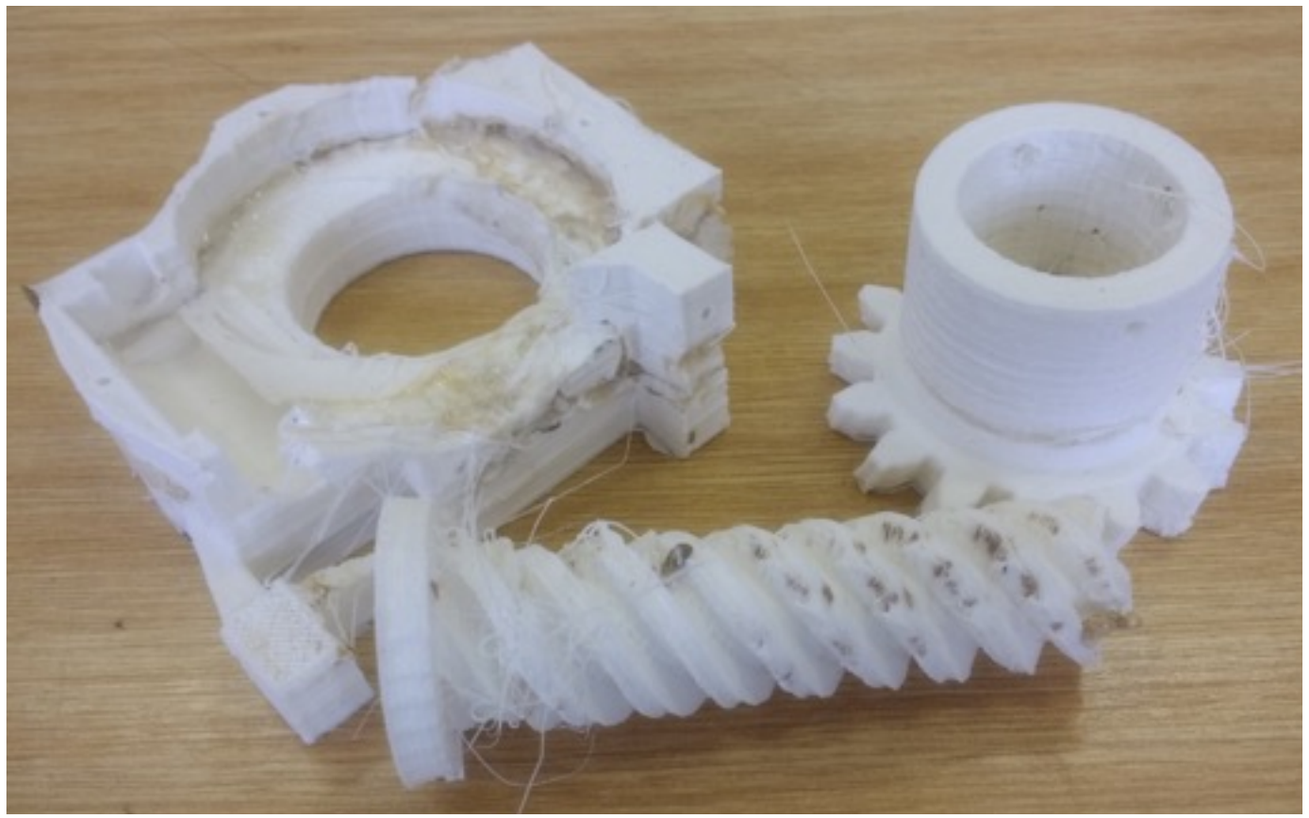
Nylon string



Axis of rotation

7

Challenges faced during construction



Stringing

Warping

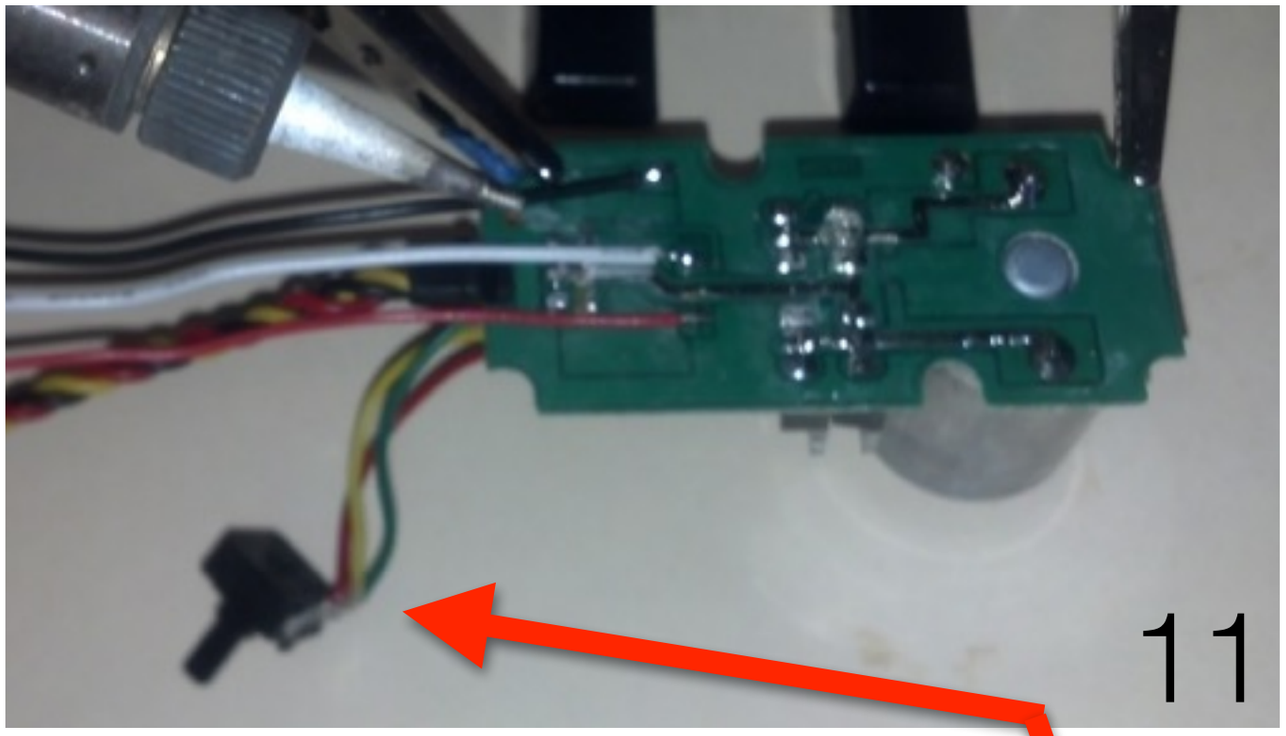
8

9

Repairs using soldering iron, files, and hot glue gun

Servo Modifications

10



11

Extracted circuit board

Removed internal potentiometer

Lengthened Wire

Removed Mechanical Endstop

Software

Open Loop

13

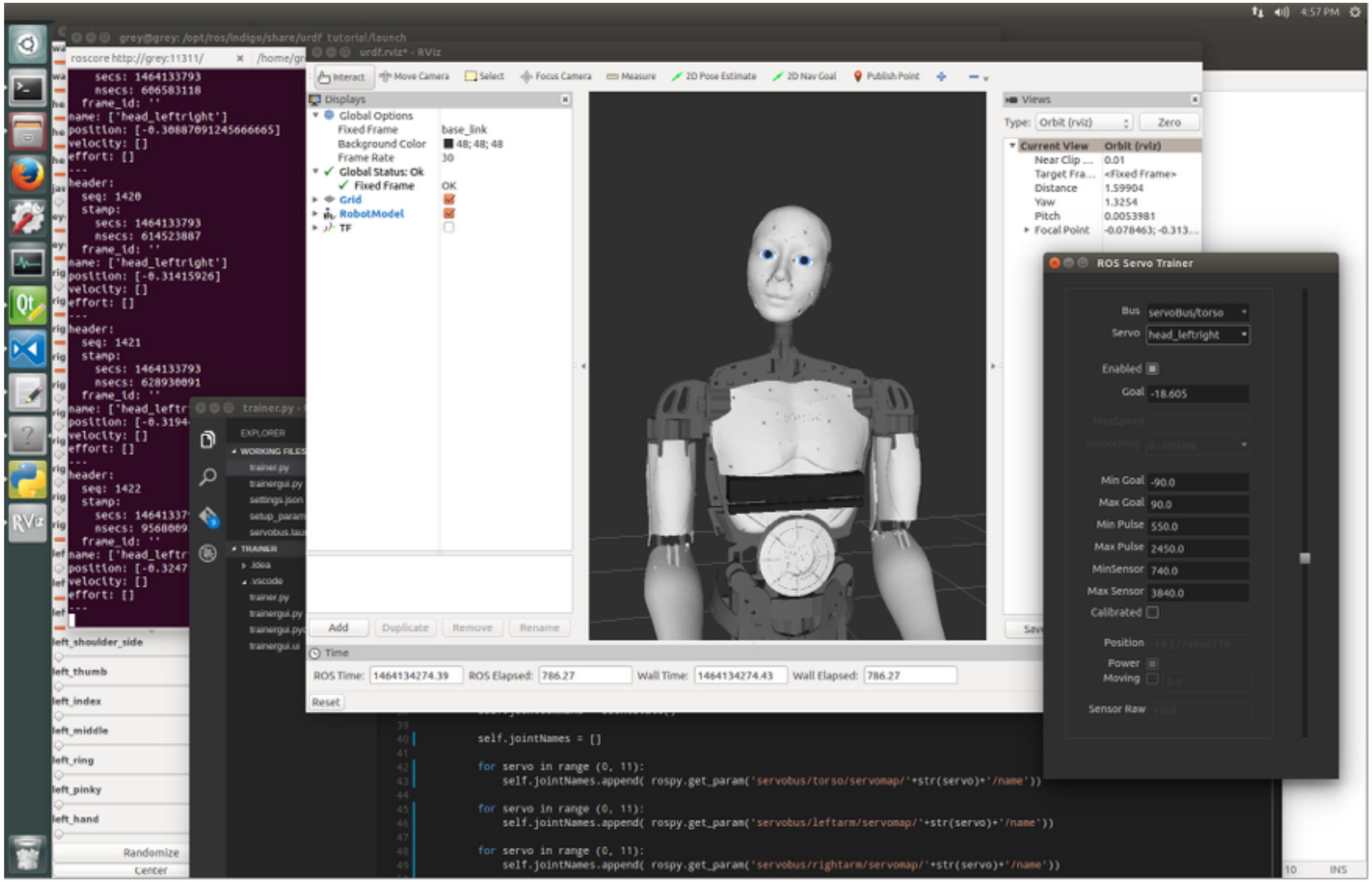
USB Serial

14

- High-level Control
- Motion Planning
- Rigid Body Simulation

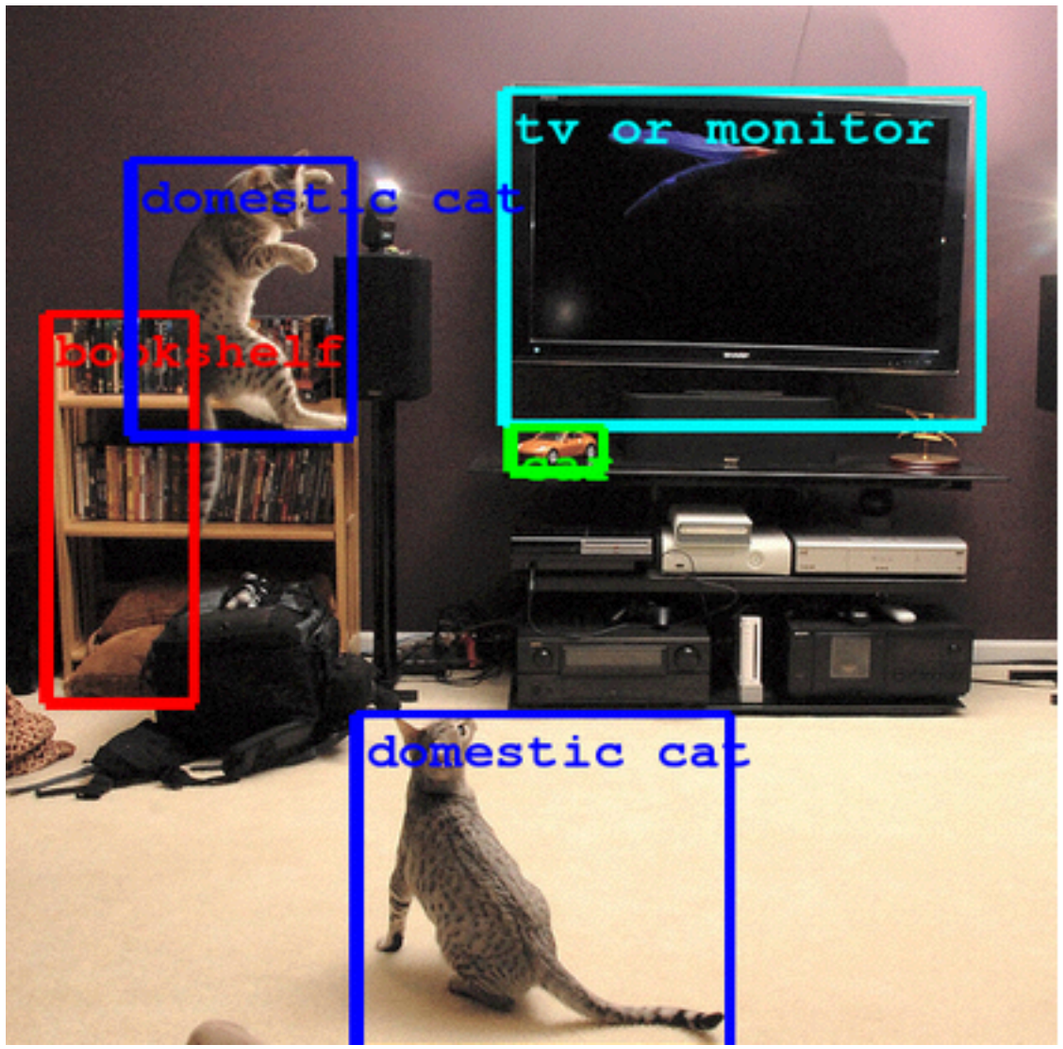
- Low-level Control
- Motor Actuation

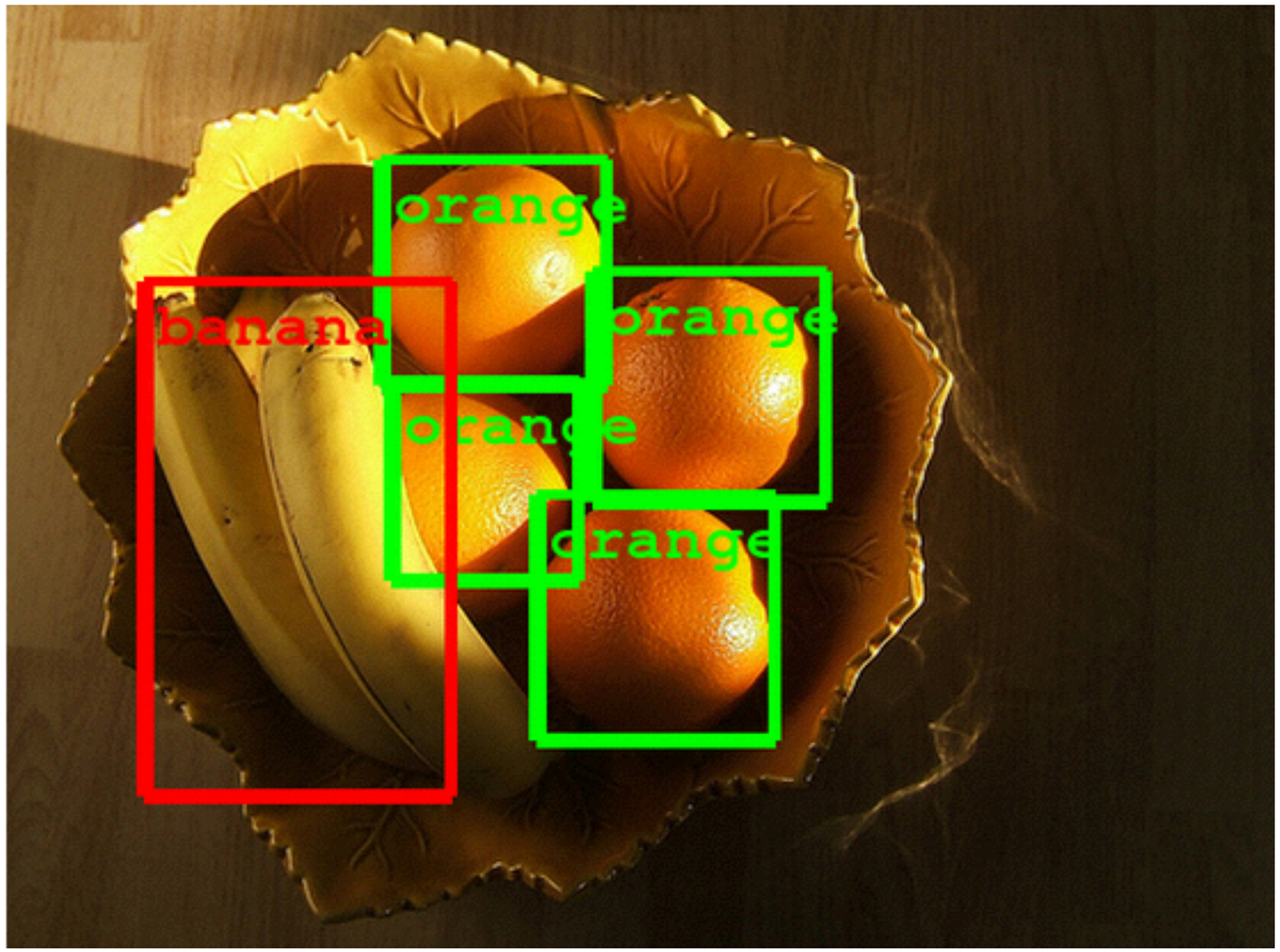
Rviz



Source: https://github.com/alansrobotlab/inmoov_ros

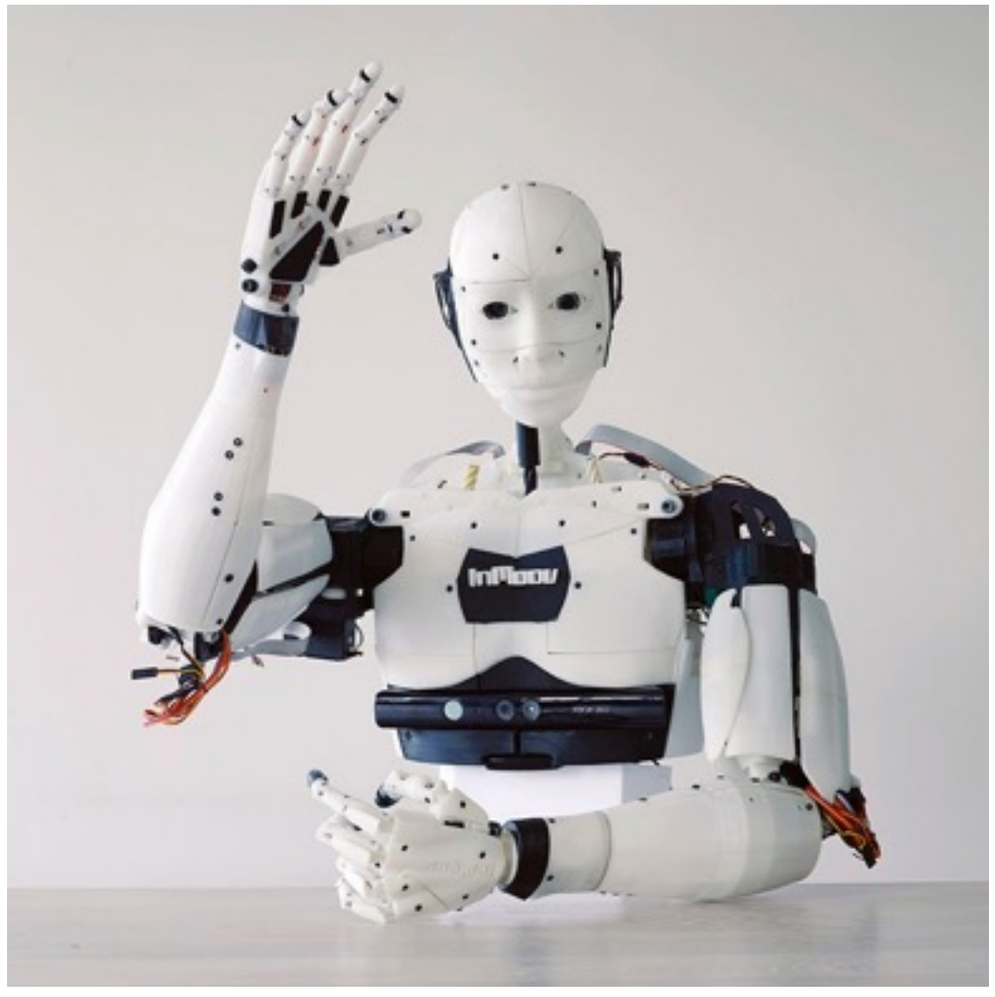
Future - Image Recognition





Demo

Special thanks to doc. Ing. Martin Novák, Ph.D.!



Thank you for listening!