Pepper
Pose Mirroring

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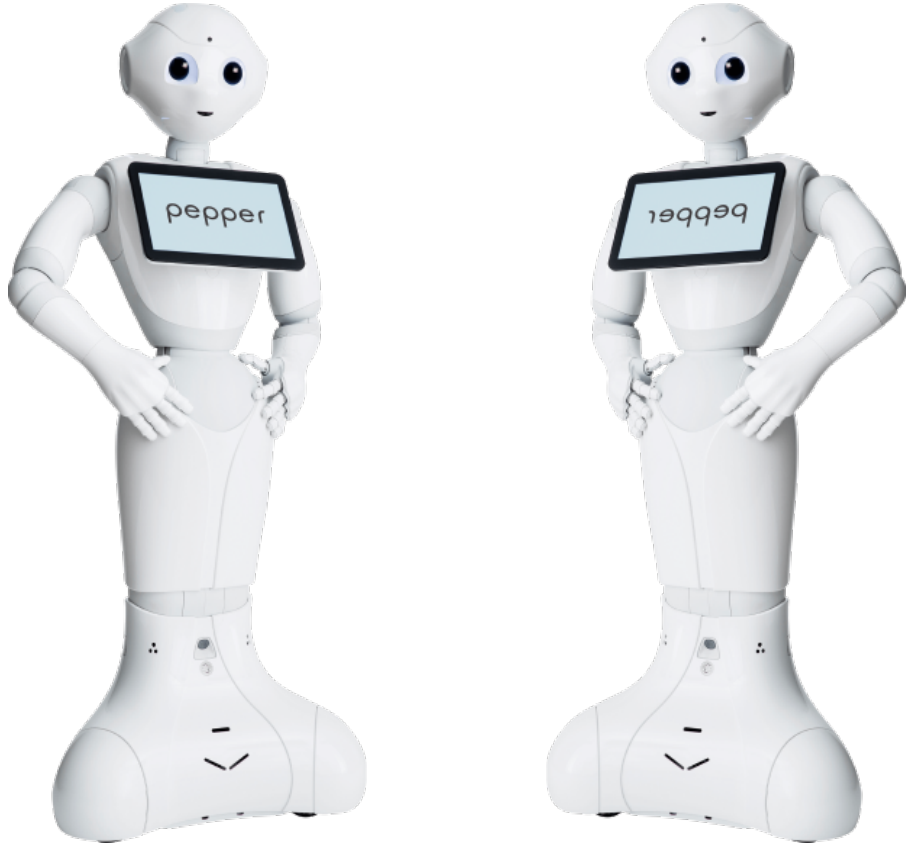
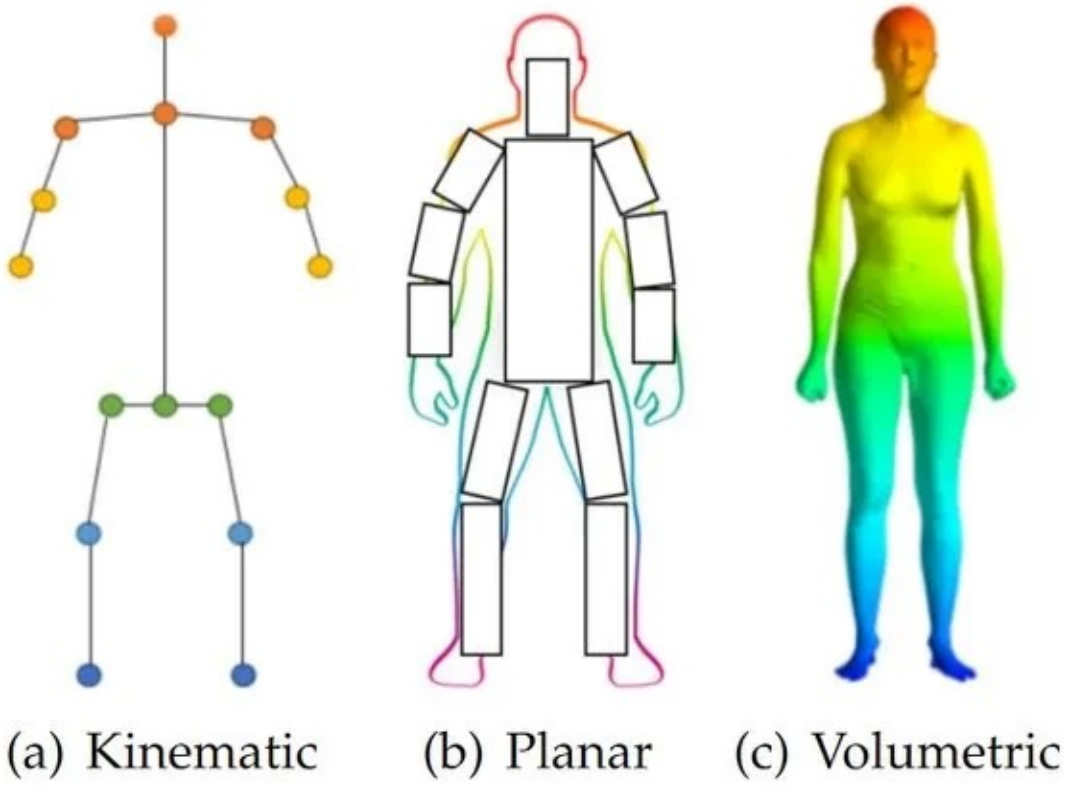


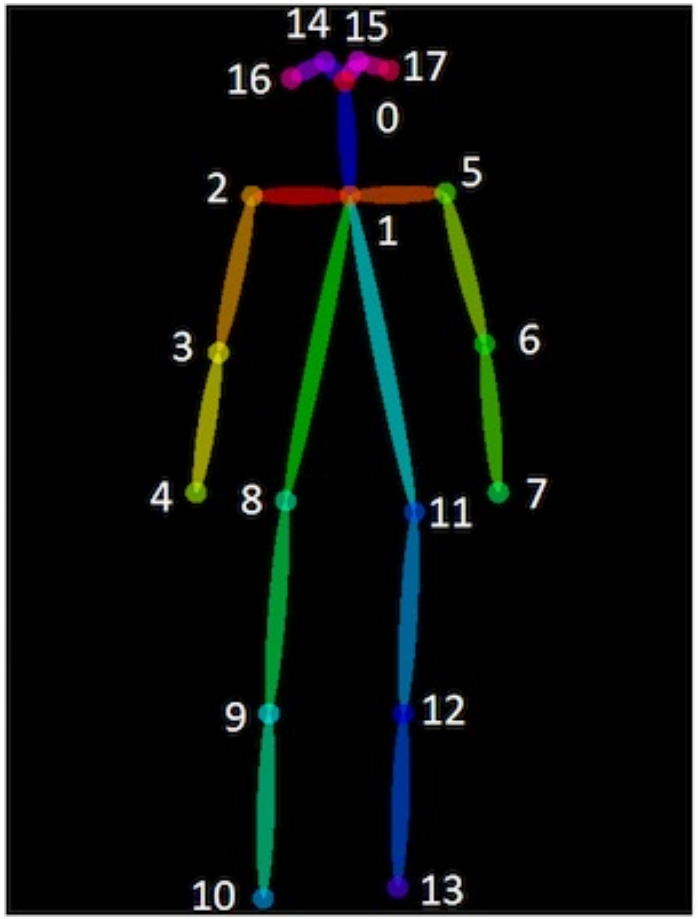
Pose estimation

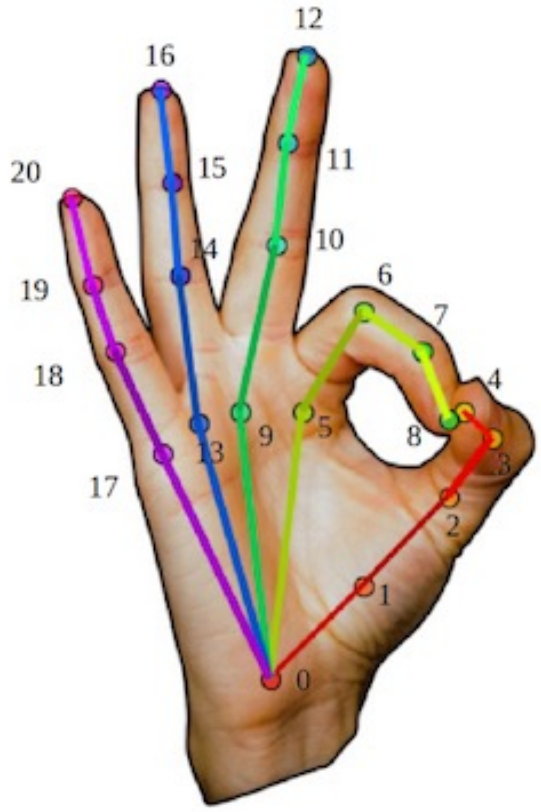
- Using a single 2D RGB camera
- For the purpose of mirroring the pose on a robot, kinematic estimation is good enough
- Keypoint map directly to robot's joints



Pose estimation

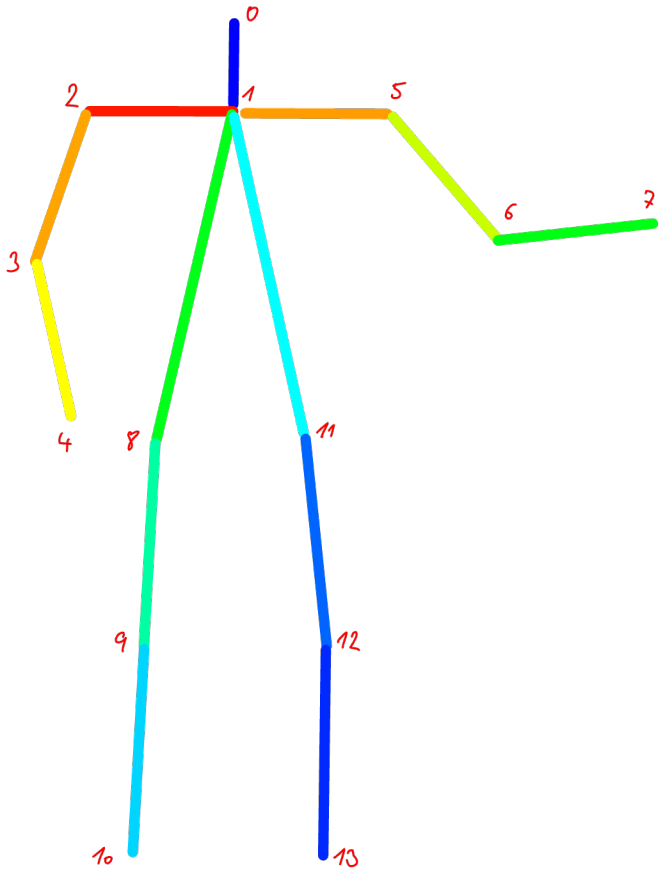
- pytorch-openpose
  - open-source implementation of OpenPose
- Body pose is estimated by 18 keypoints
- Each hand is estimated by 18 keypoint

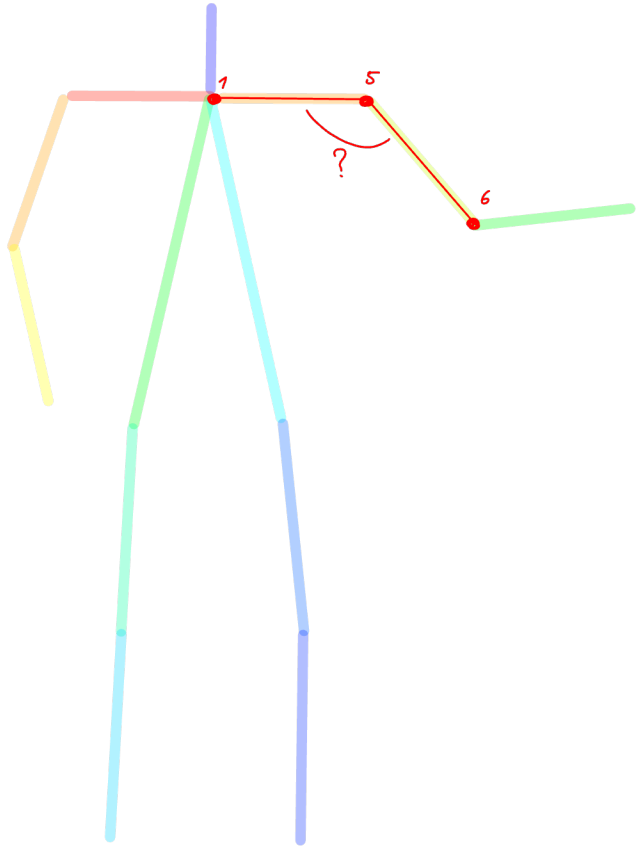


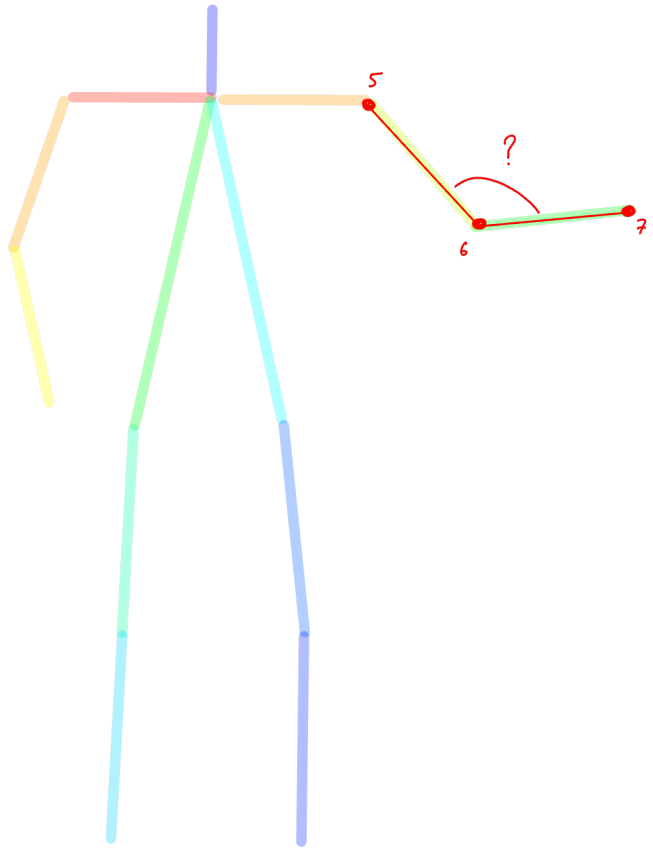


Transforming pose to commands for Pepper

- We assume the person is onoly moving in a 2D plane in parallel with his/her shoulders
- We calculate the angle between arm segments in radians and tell Pepper to move his arms to that angle

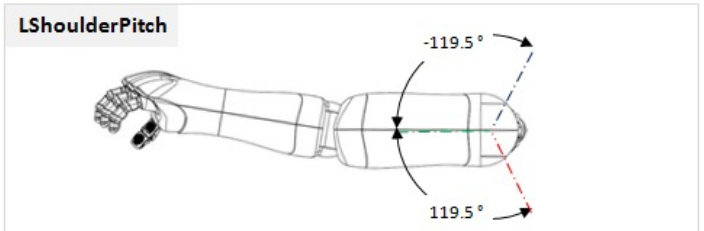


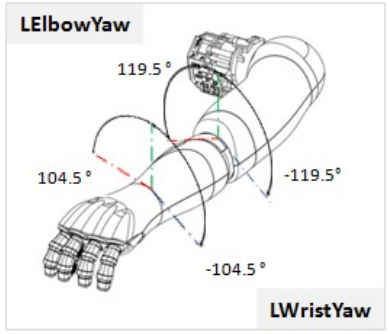


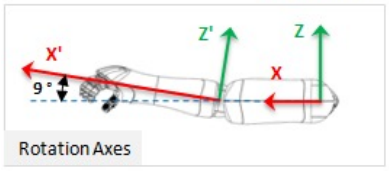


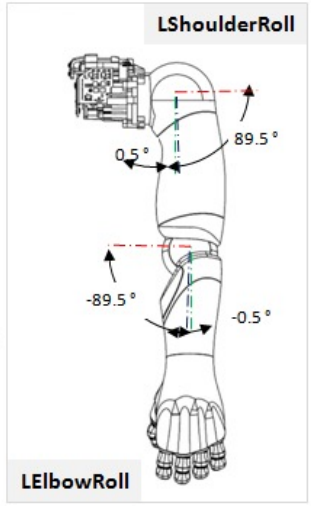
Controlling Pepper

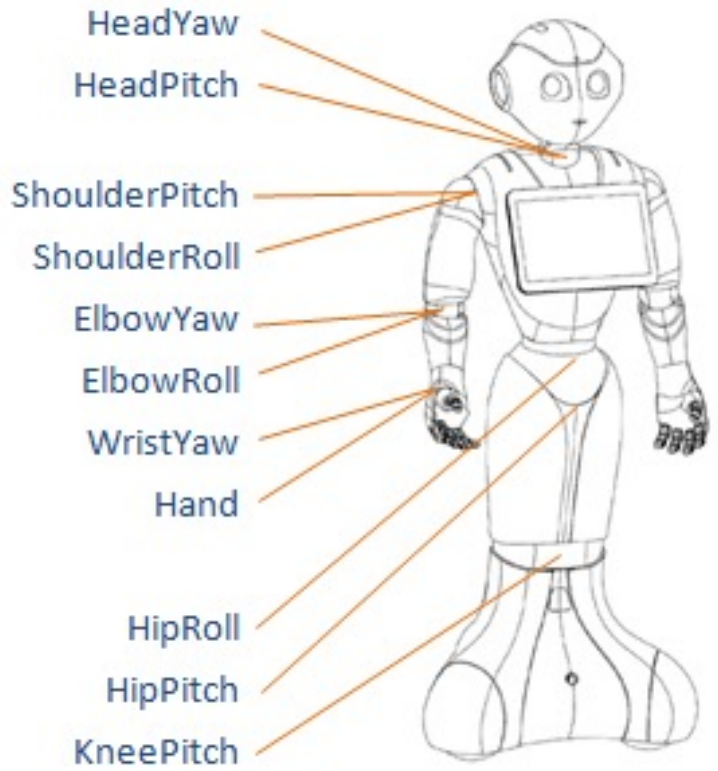
- Available commands:
  - Move joint by angle
  - Open / close hand

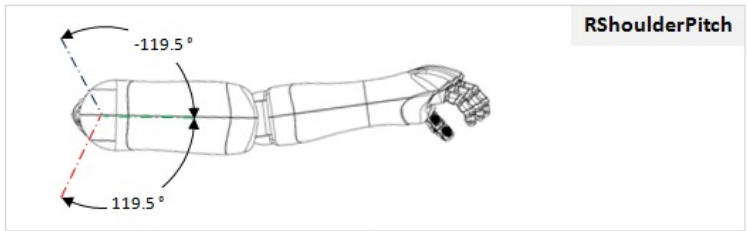


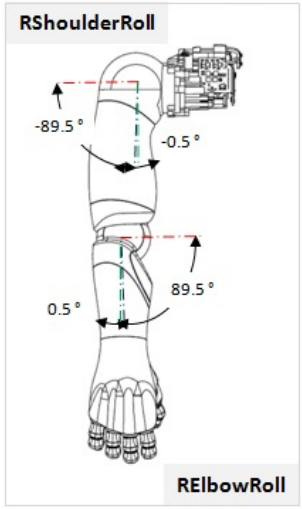


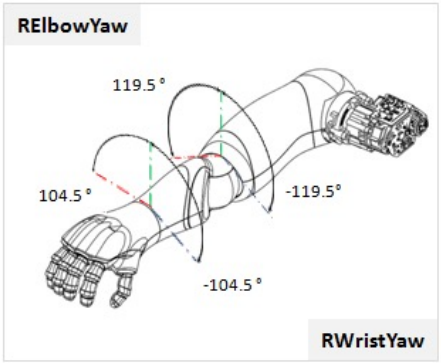


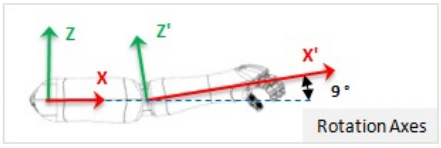












Demo