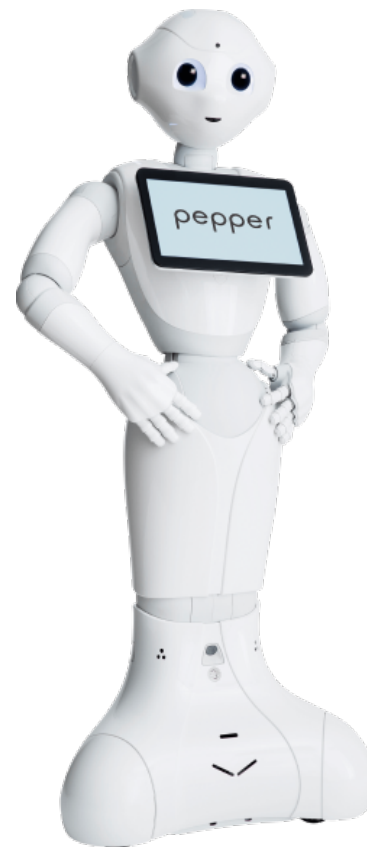


Pepper Pose Mirroring

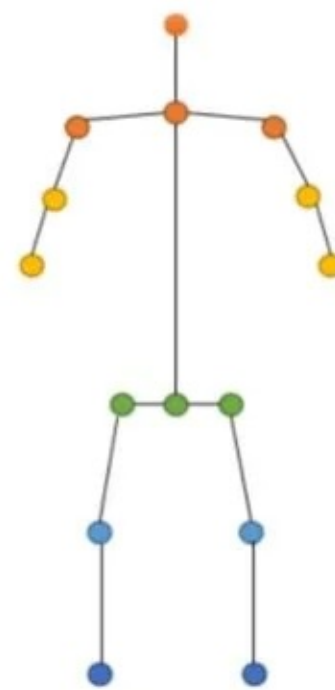
Tomáš Trejdl, Vojtěch Tilhon

KSY 2021/22, FEL ČVUT



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



(a) Kinematic



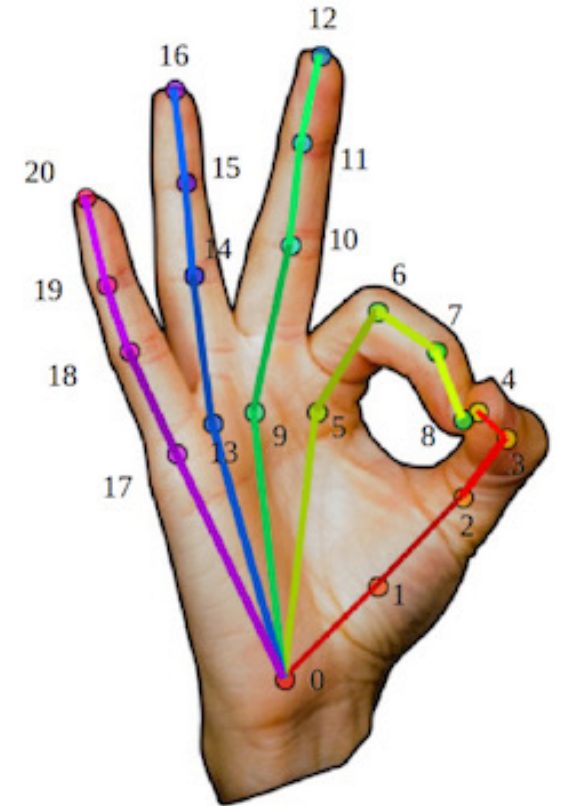
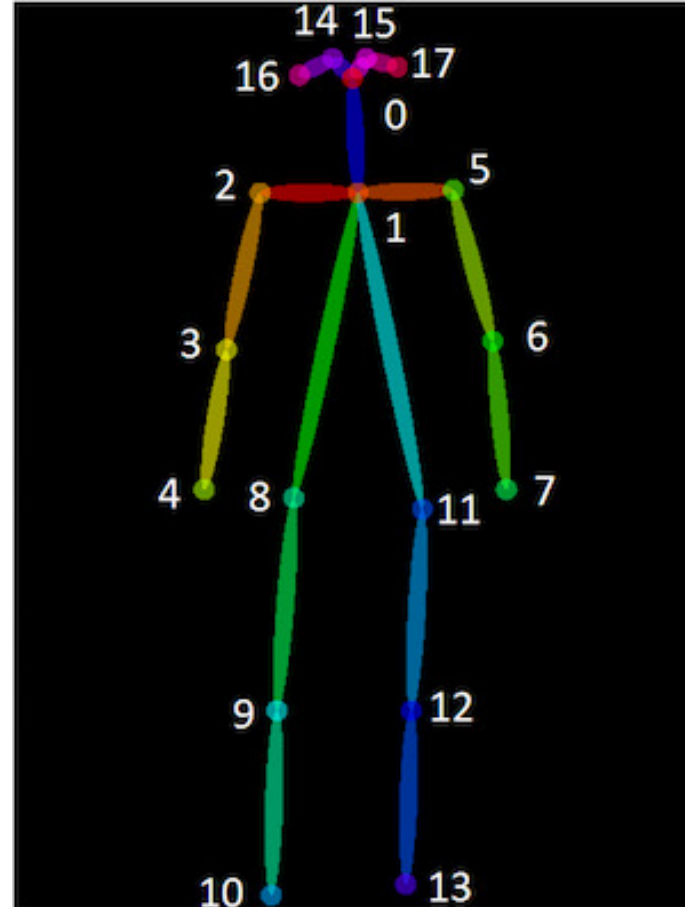
(b) Planar



(c) Volumetric

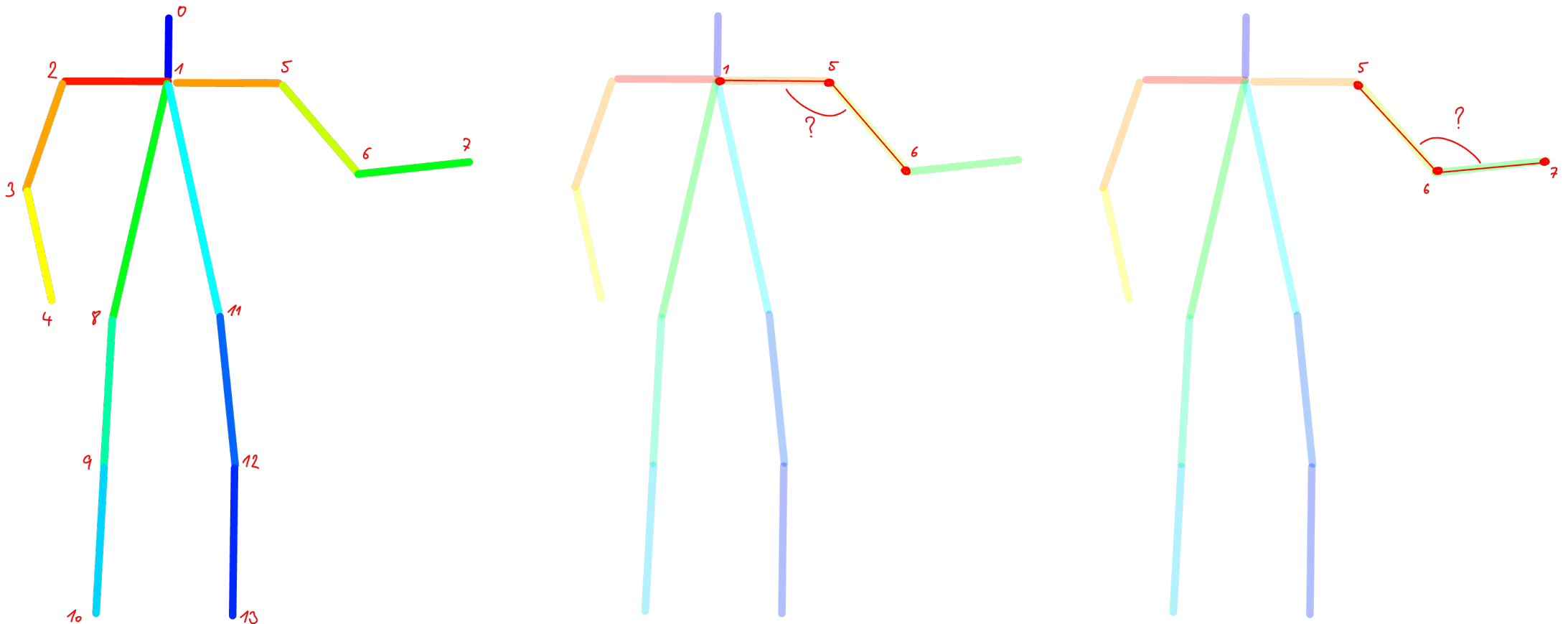
Pose estimation

- [pytorch-openpose](#)
 - open-source implementation of [OpenPose](#)
- Body pose is estimated by 18 keypoints
- Each hand is estimated by 21 keypoints



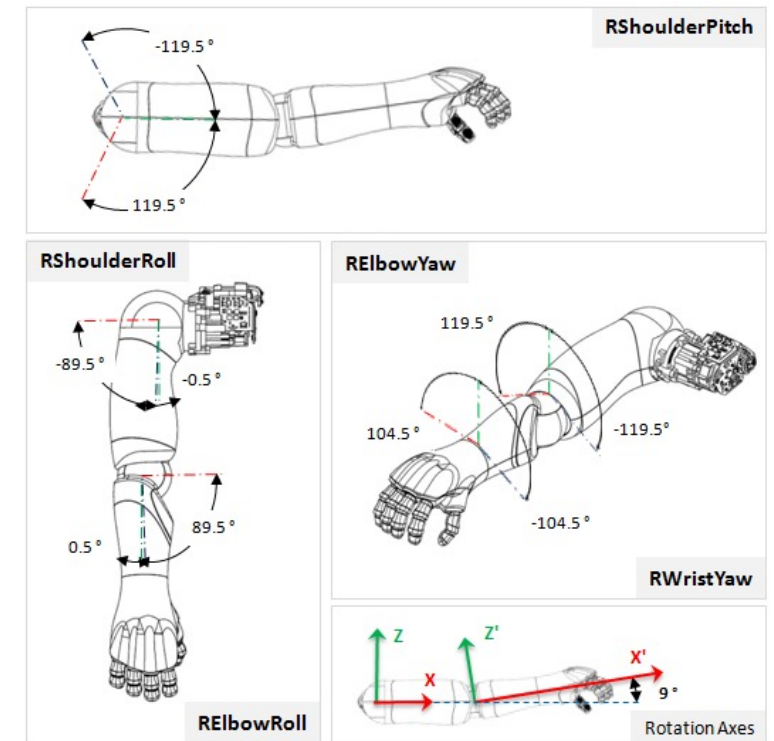
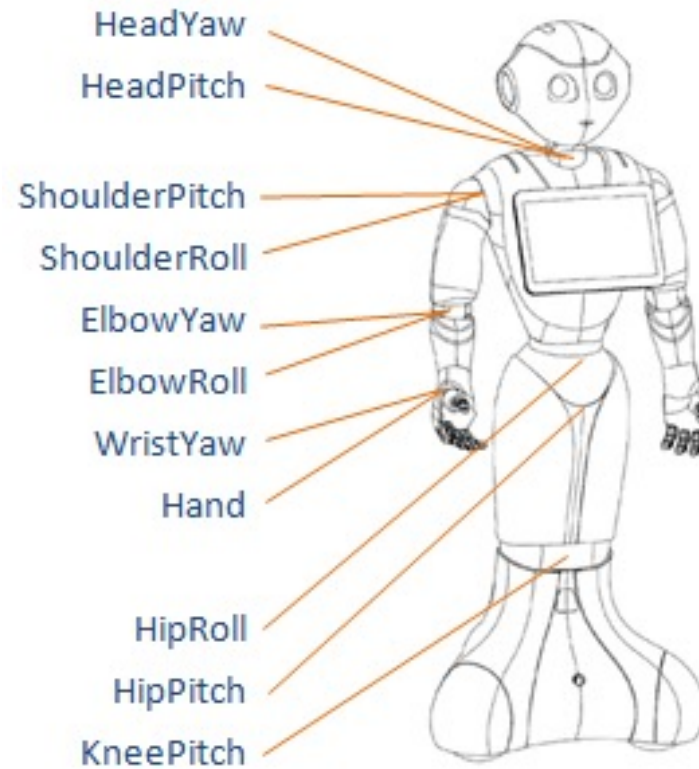
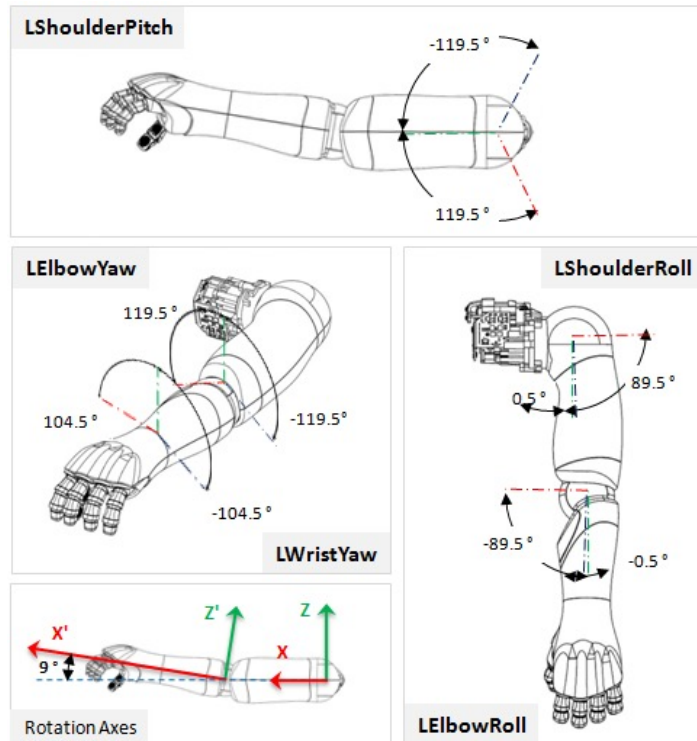
Transforming pose to commands for Pepper

- We assume the person is only 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



Demo

