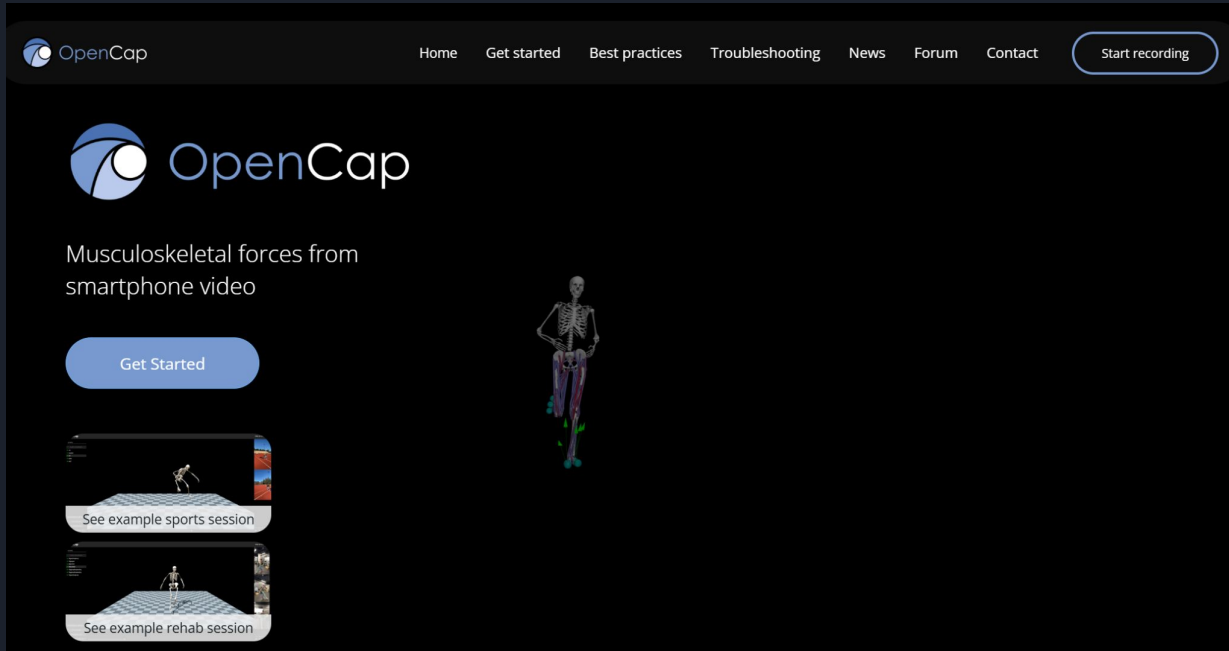


A decorative graphic on the left side of the slide consists of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

# Human Pose Estimation

Danny Perkins and Alex Pierce

# OpenCap



- Camera Setup
- Calibration
- Data Collection

Trial name

START RECORDING

- neutral
- Trial1
- JumpingJack
- JogInPlace
- Static

▼

☐ Show removed trials

NEW SESSION, SAME SETUP

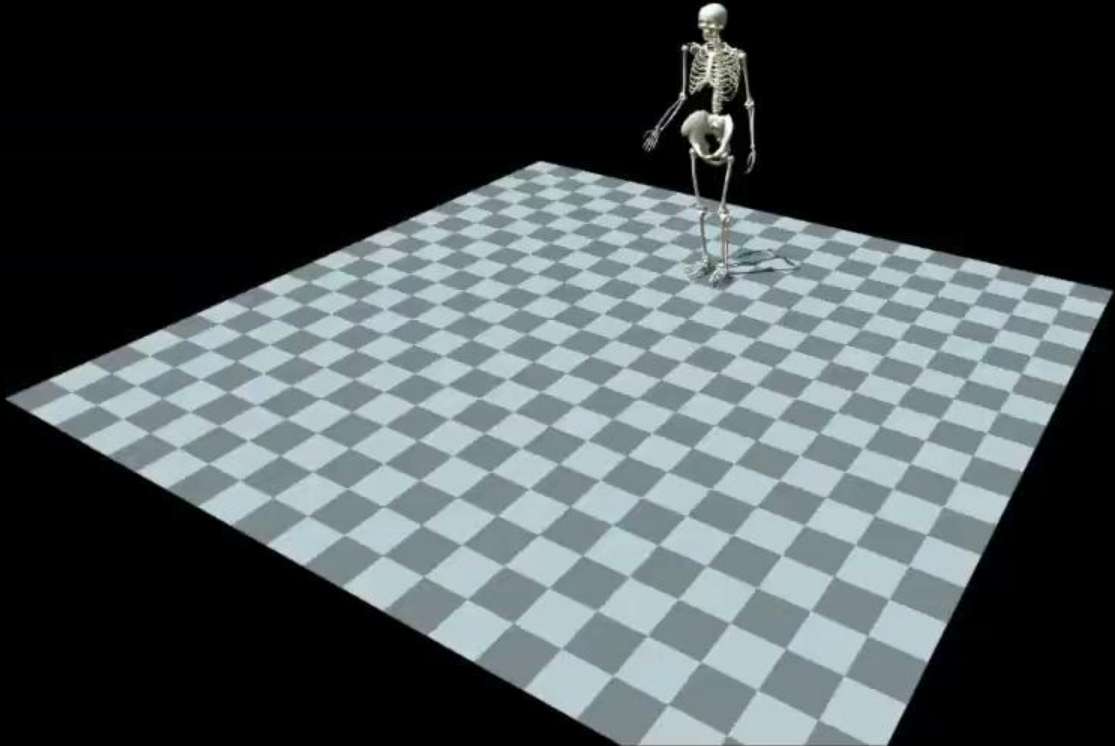
NEW SESSION

SHARE SESSION PUBLICLY

DOWNLOAD DATA

DASHBOARD KINEMATICS

BACK TO SESSION LIST



Time (s)  
3.51



0.1x 0.25x 0.5x 0.75x 1x 2x





Trial name

START RECORDING

☒ neutral☒ Trial1☒ JumpingJack☒ JogInPlace☒ ...☐ Show removed trials

NEW SESSION, SAME SETUP

NEW SESSION

SHARE SESSION PUBLICLY

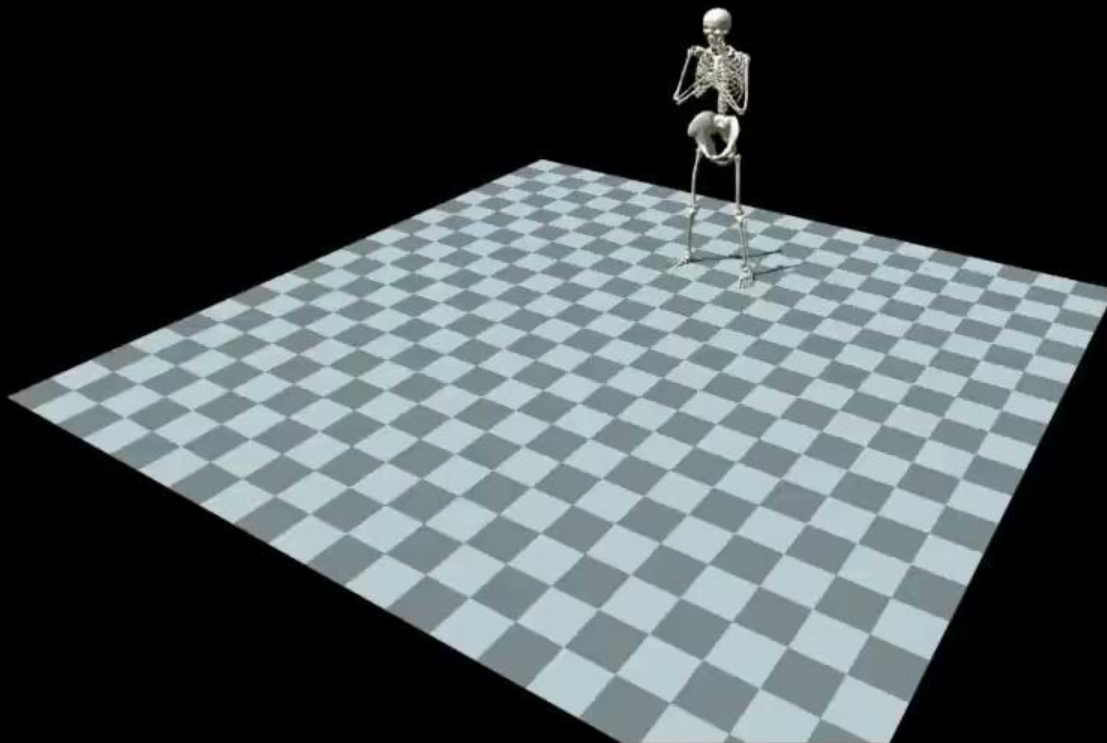
DOWNLOAD DATA

DASHBOARD KINEMATICS

BACK TO SESSION LIST

Time (s)

6.62



0.1x 0.25x 0.5x 0.75x 1x 2x



Trial name

START RECORDING

● neutral

● Trial1

● JumpingJack

● JogInPlace

● Shuffle

☐ Show removed trials

NEW SESSION, SAME SETUP

NEW SESSION

SHARE SESSION PUBLICLY

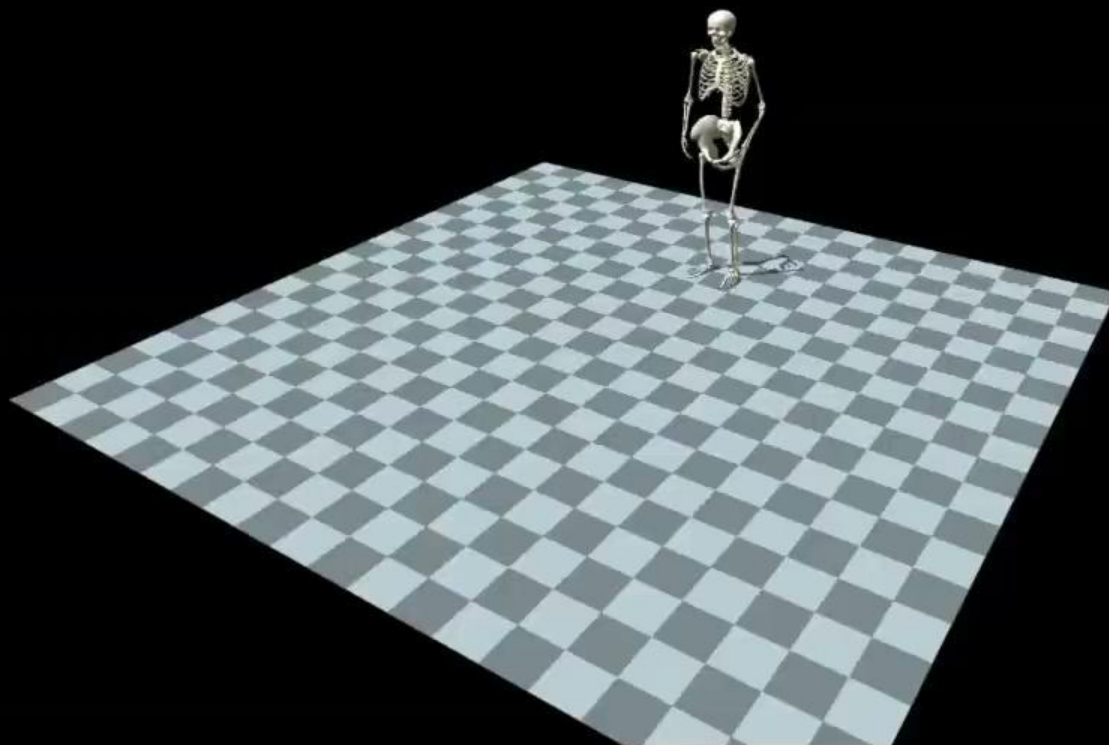
DOWNLOAD DATA

DASHBOARD KINEMATICS

BACK TO SESSION LIST

Time (s)

0.15



0.1x 0.25x 0.5x 0.75x 1x 2x





Trial name

START RECORDING

- ☒
JumpingJack
- ☒
JogInPlace
- ☒
Stretch
- ☒
NinjaMoves

☐ Show removed trials

NEW SESSION, SAME SETUP

NEW SESSION

SHARE SESSION PUBLICLY

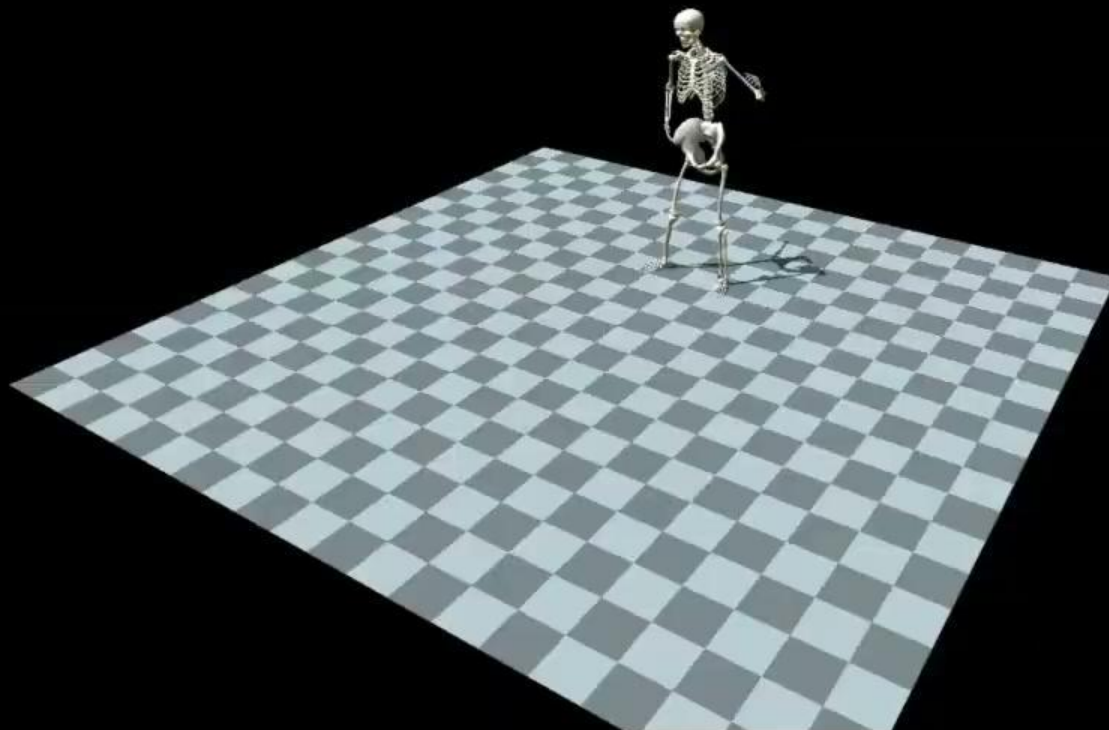
DOWNLOAD DATA

DASHBOARD KINEMATICS

BACK TO SESSION LIST

Time (s)

0.05



0.1x 0.25x 0.5x 0.75x 1x 2x







Trial name

START RECORDING

▼

● JumpingJack

● JogInPlace

● Stretch

● NinjaMoves

☐ Show removed trials

NEW SESSION, SAME SETUP

NEW SESSION

SHARE SESSION PUBLICLY

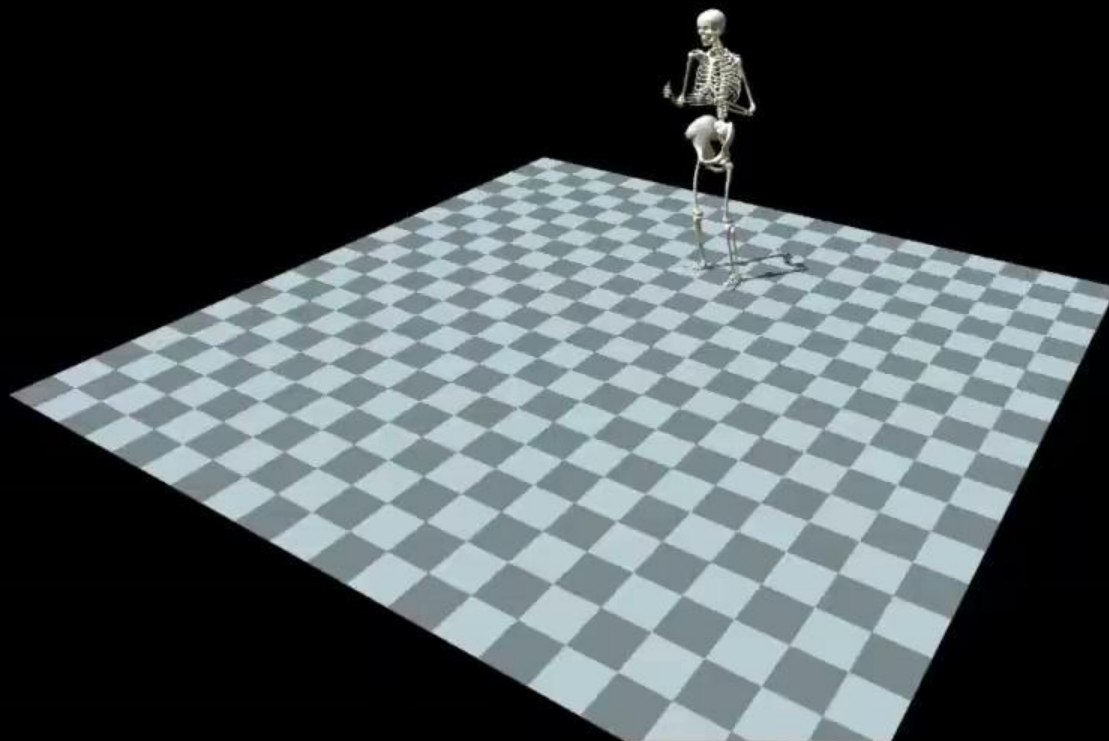
DOWNLOAD DATA

DASHBOARD KINEMATICS

BACK TO SESSION LIST

Time (s)

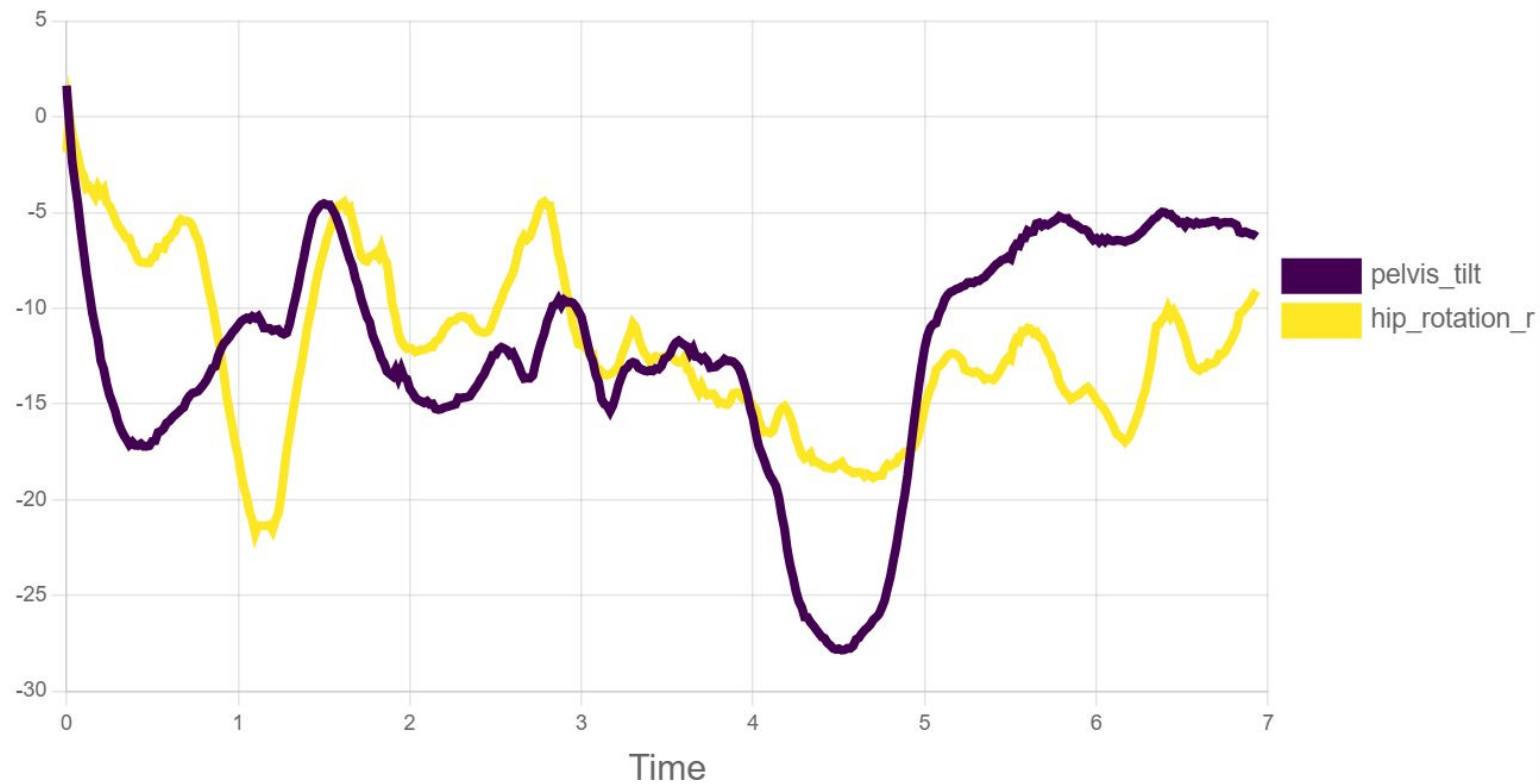
0.16



0.1x 0.25x 0.5x 0.75x 1x 2x



# Jumping Jacks



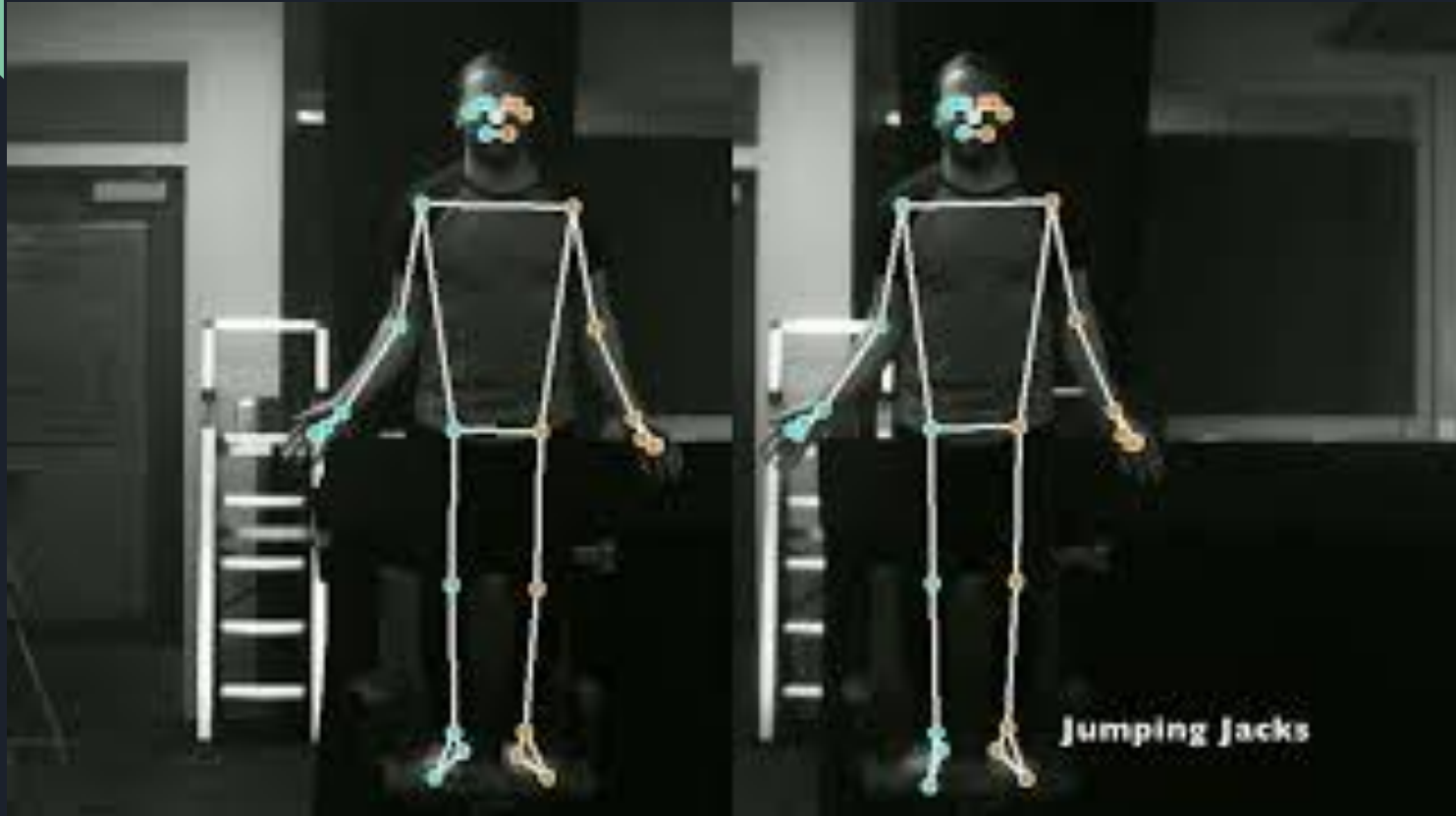


# Our Model

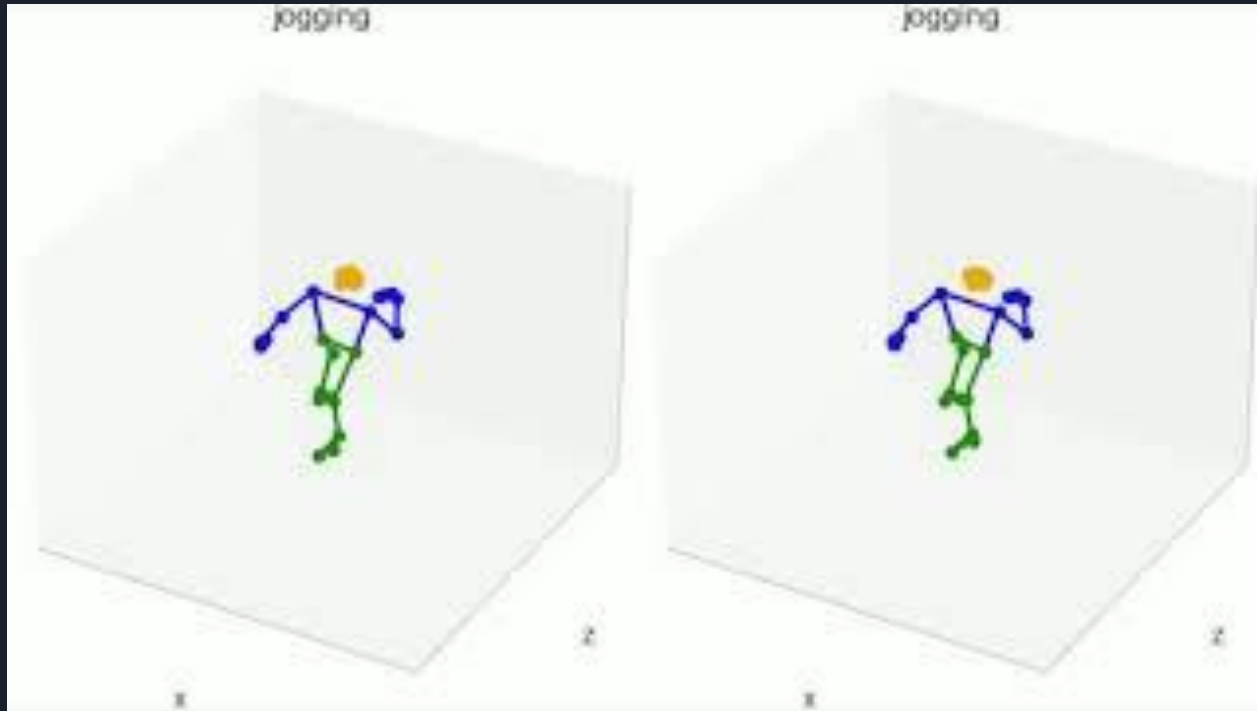


- Get 2-D Pixel Coordinates
  - MediaPipe (Google)
  - Find the region of interest
  - Use deep neural network to get pixel coordinates of each joint
- Get 3-D Coordinates
  - Calibrate the stereo system
  - Undistort the points - `undistortPoints()`
  - Triangulation - `triangulatePoints()`
- Smooth the coordinates, with a Gaussian filter

# Right and Left Camera Videos for Actions



# 3-D coordinates (both with gaussian and without gaussian noise)





2D Demo time!



Thank You!