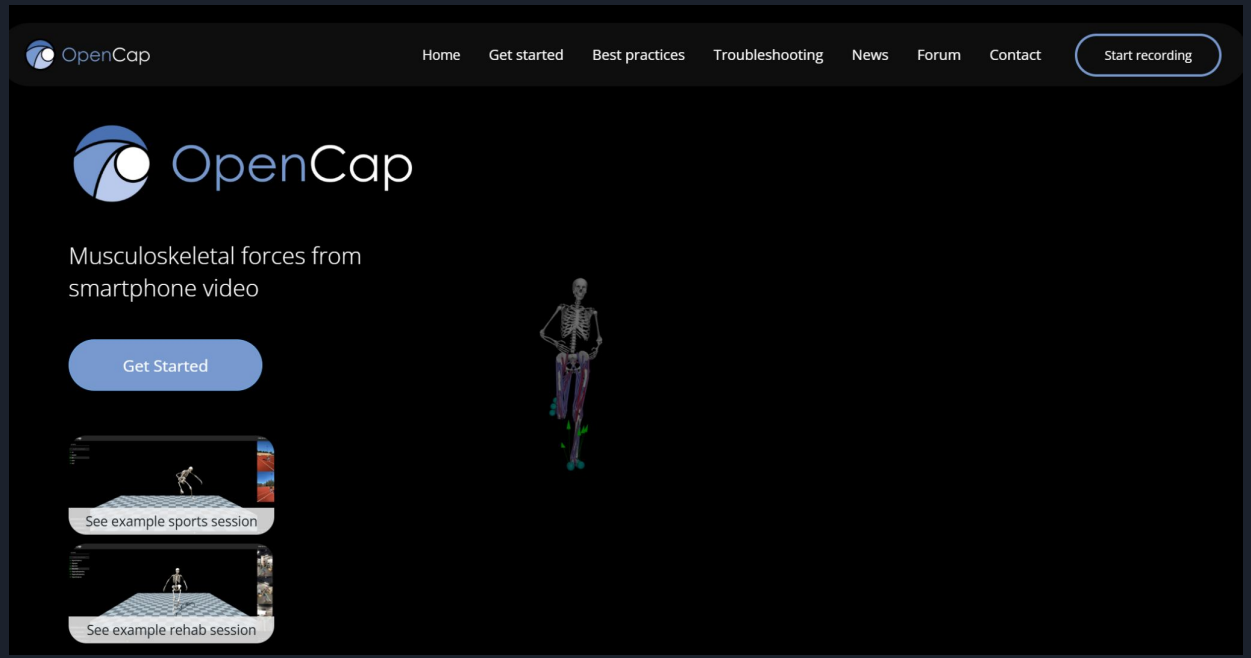
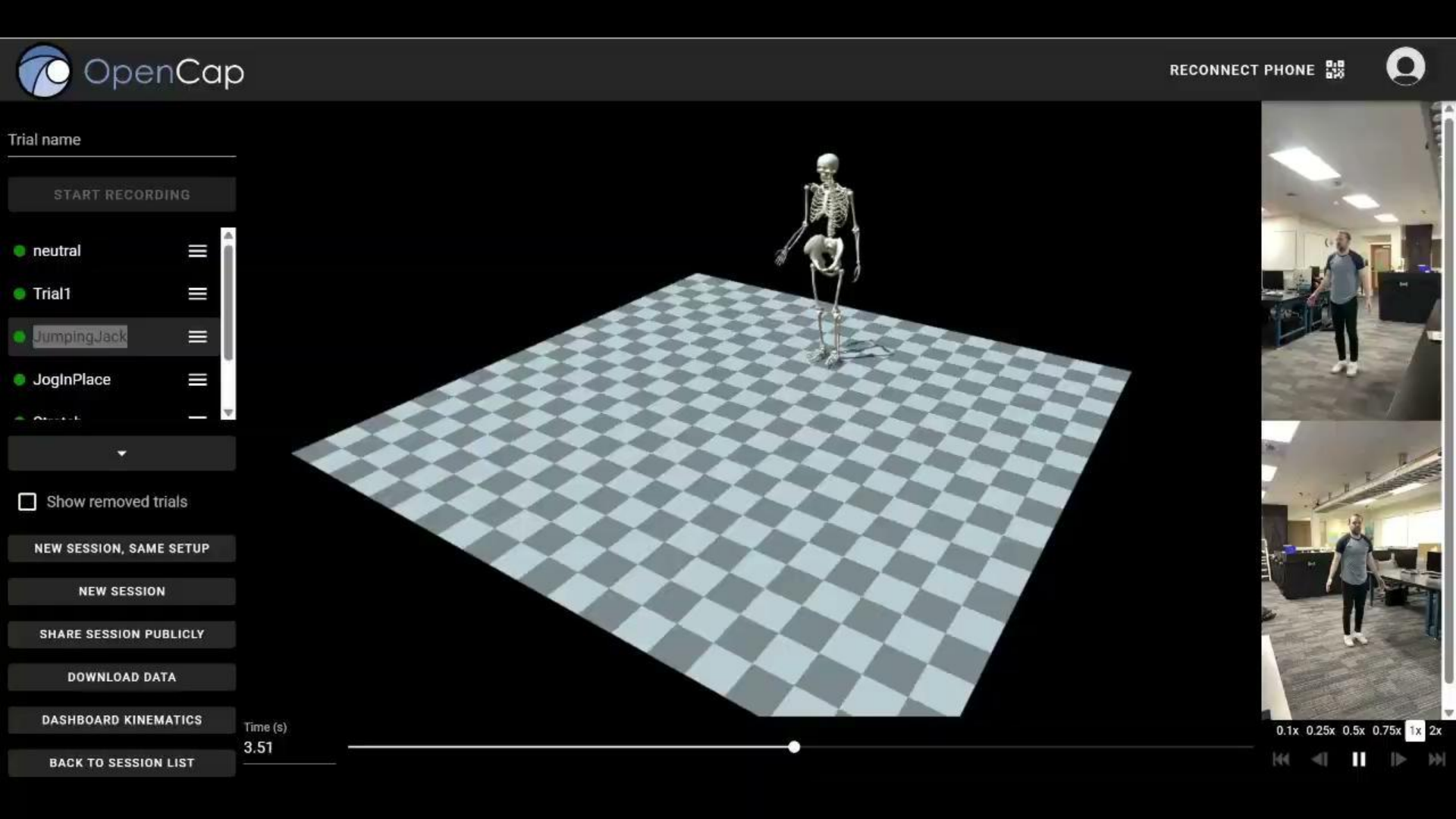
Human Pose Estimation

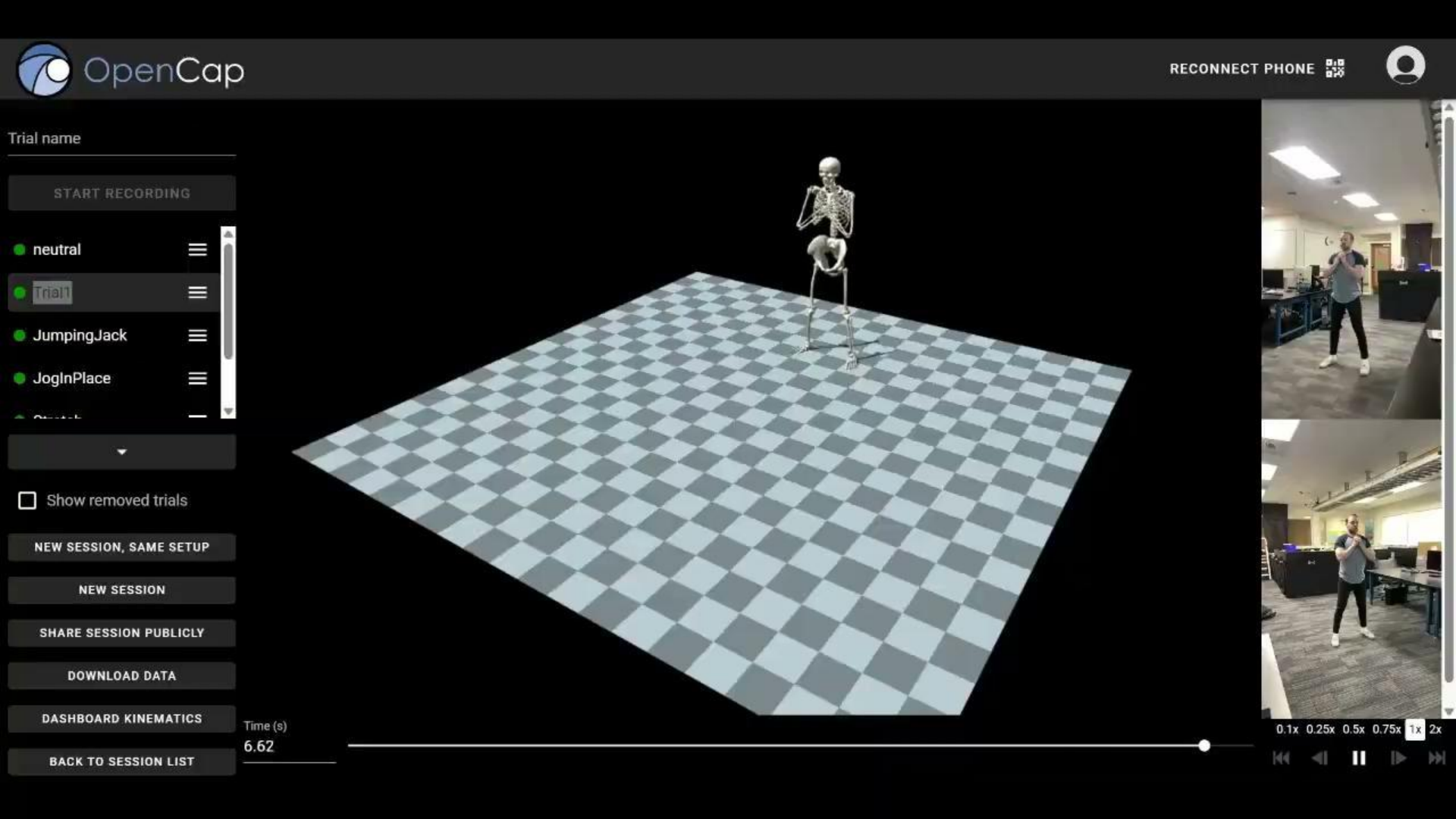
Danny Perkins and Alex Pierce

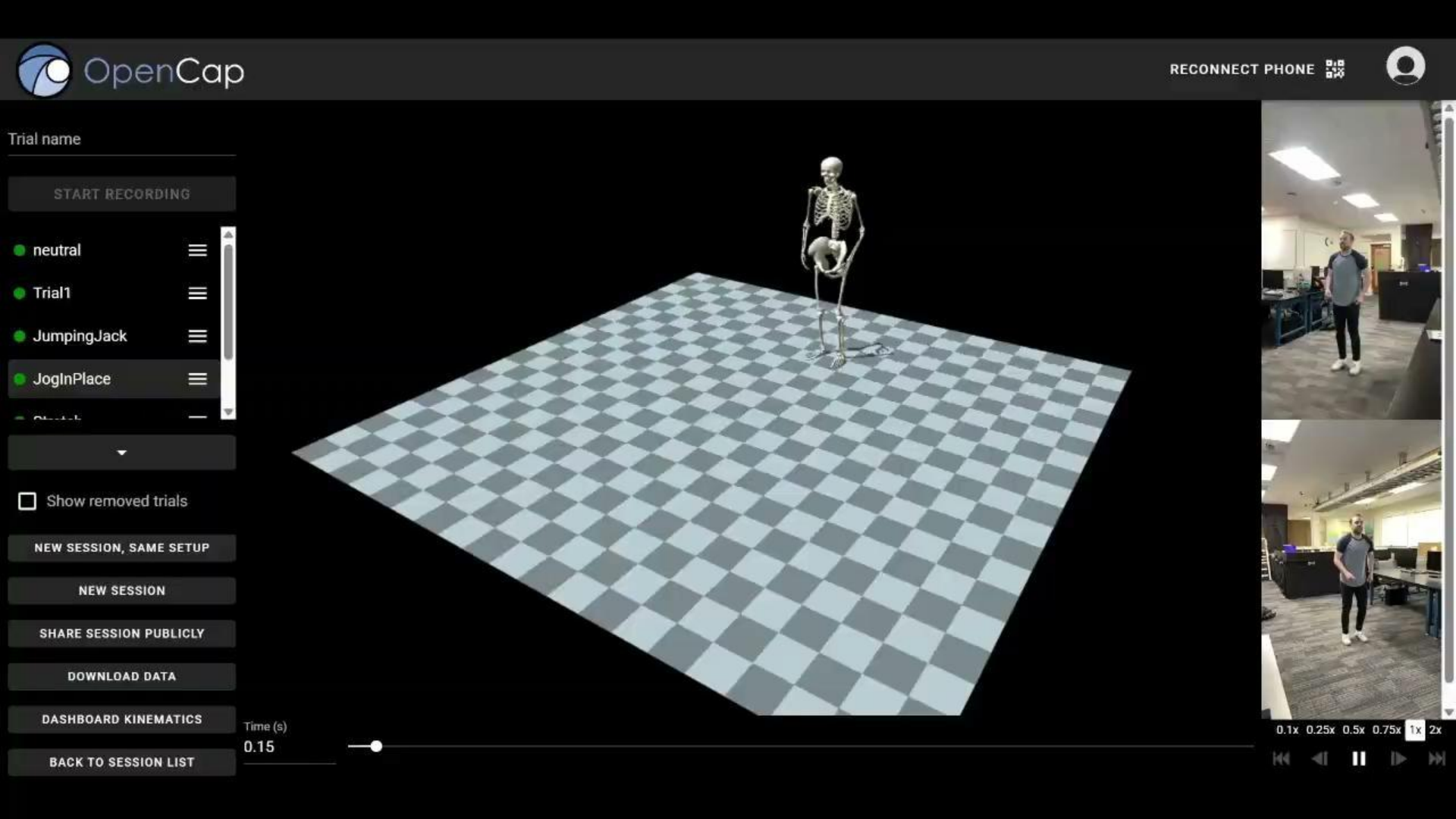
OpenCap

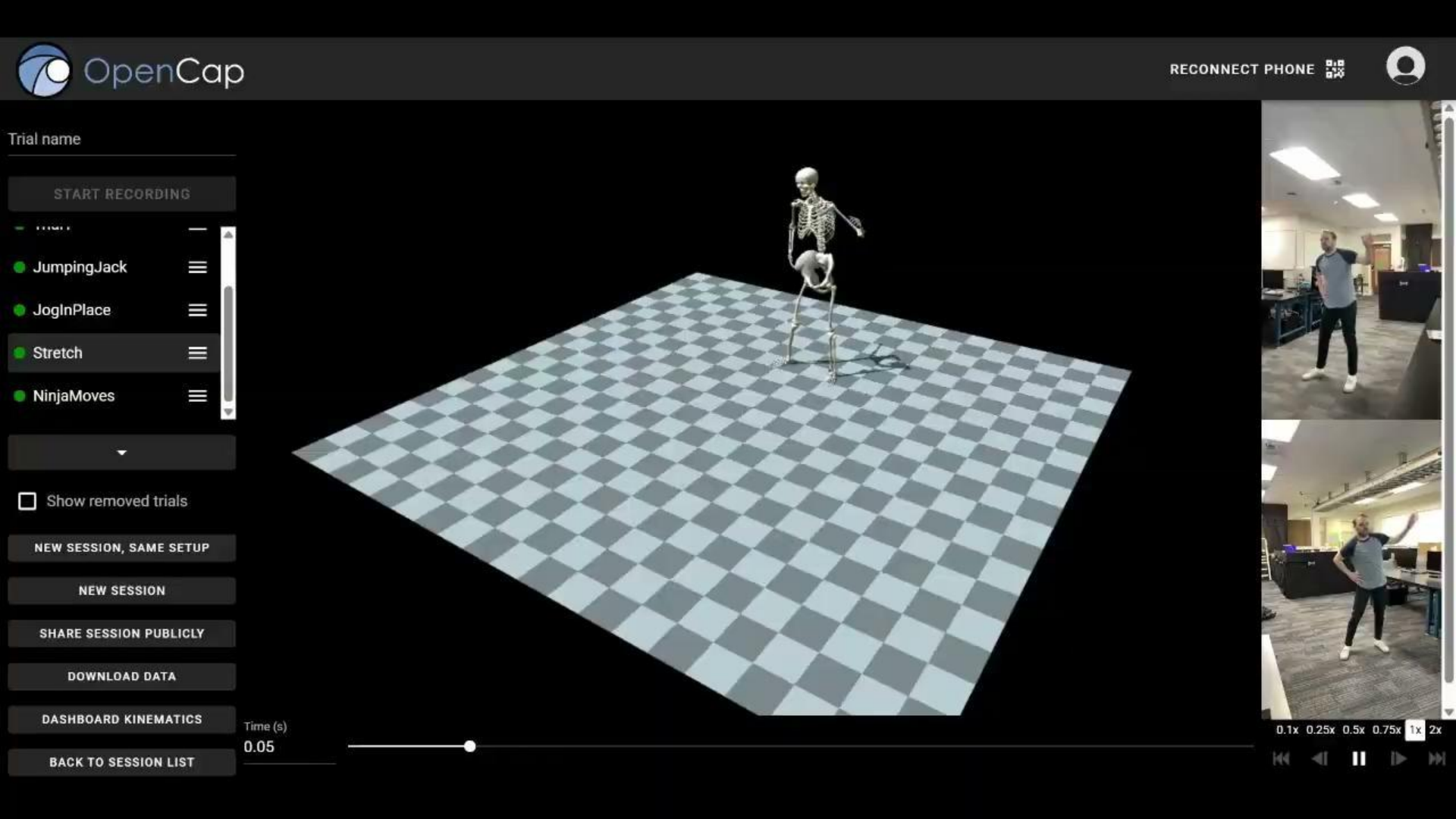


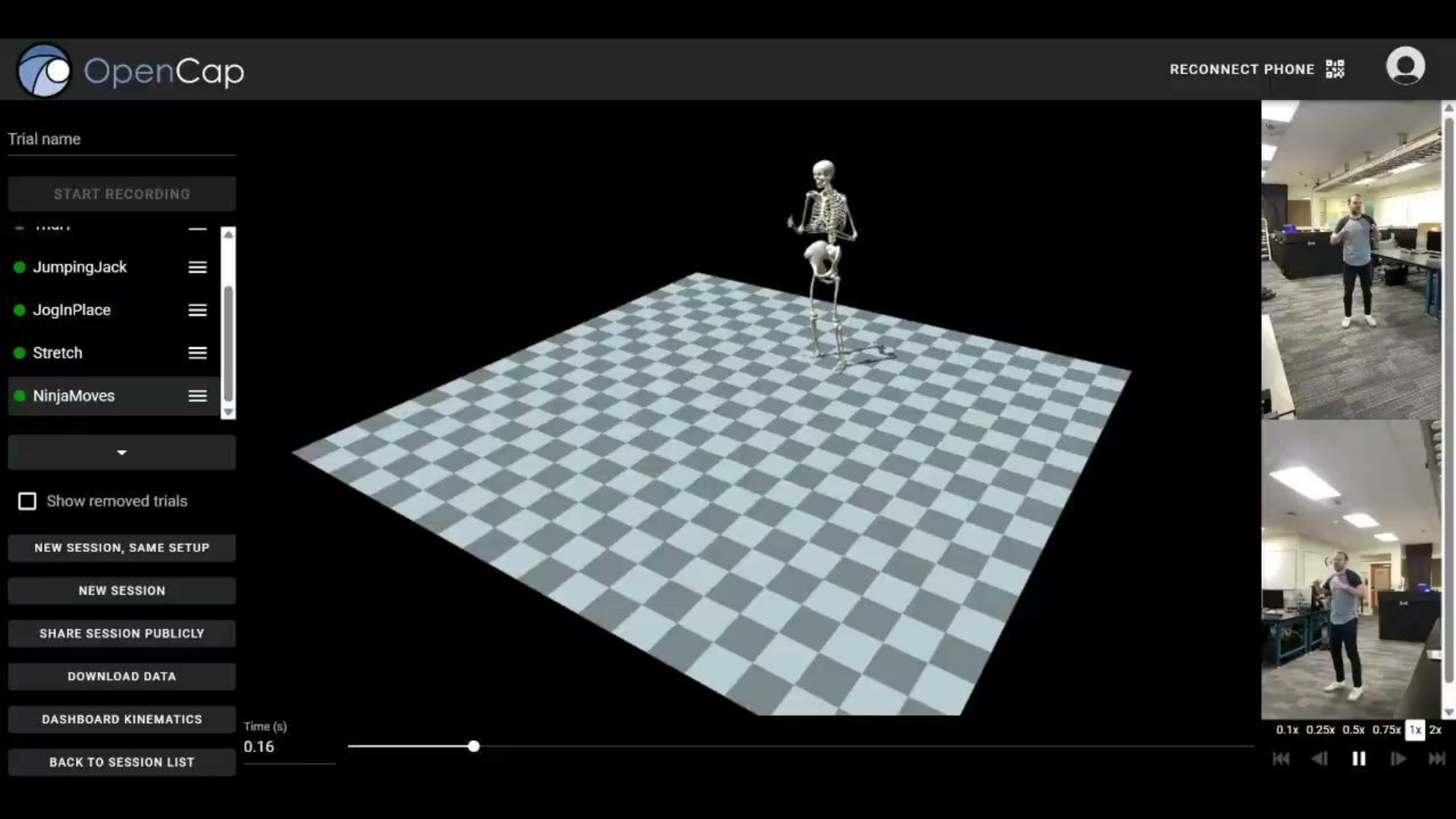
- Camera Setup
- Calibration
- Data Collection


OpenCap
RECONNECT PHONE
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)
3.51
0.1x 0.25x 0.5x 0.75x 1x 2x

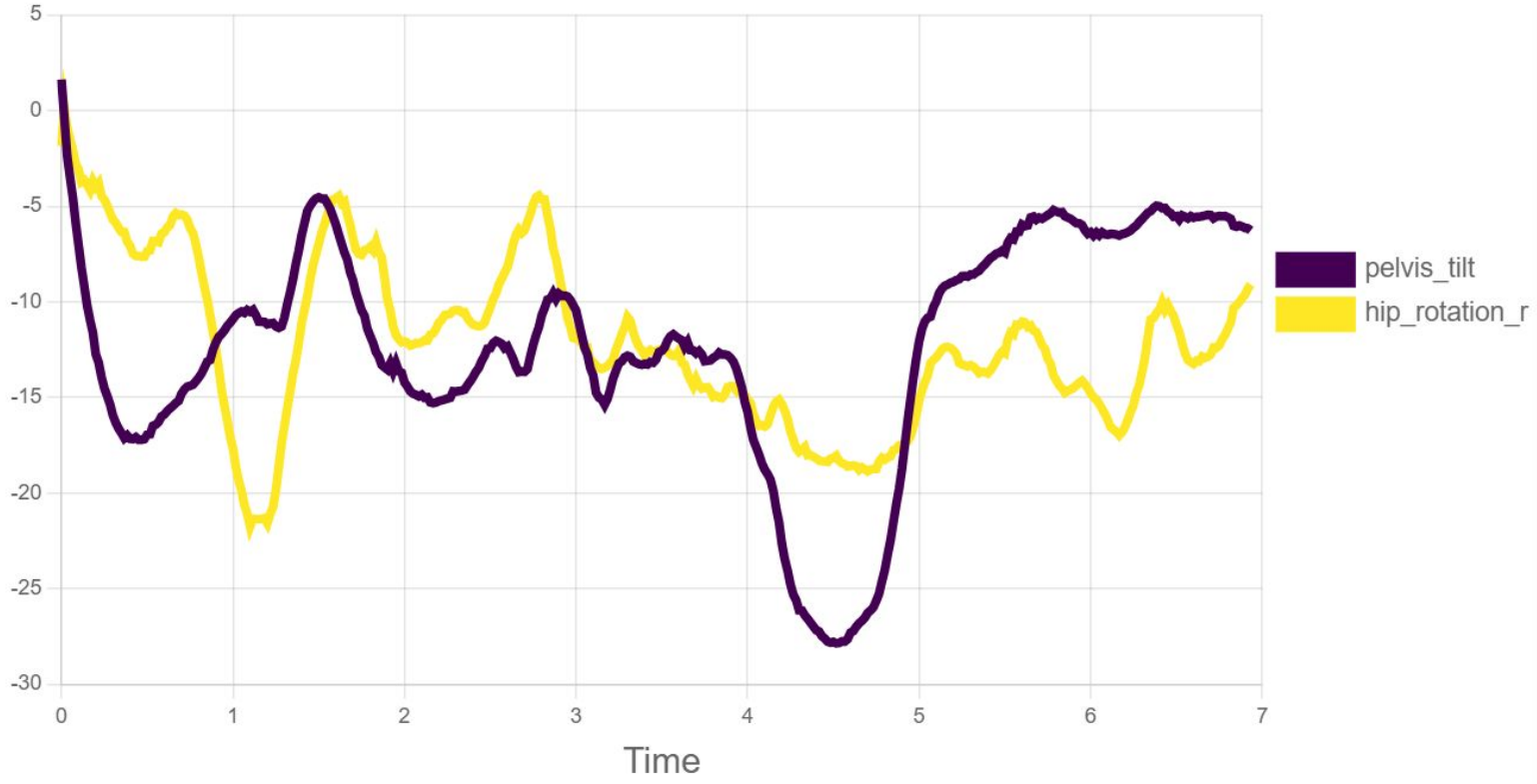

OpenCap
RECONNECT PHONE
Trial name
START RECORDING
neutral
Trial1
JumpingJack
JogInPlace
Show removed trials
NEW SESSION, SAME SETUP
NEW SESSION
SHARE SESSION PUBLICLY
DOWNLOAD DATA
DASHBOARD KINEMATICS
BACK TO SESSION LIST
Time (s)
6.62
0.1x 0.25x 0.5x 0.75x 1x 2x


OpenCap
RECONNECT PHONE
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)
0.15
0.1x 0.25x 0.5x 0.75x 1x 2x


OpenCap
RECONNECT PHONE
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


OpenCap
RECONNECT PHONE
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

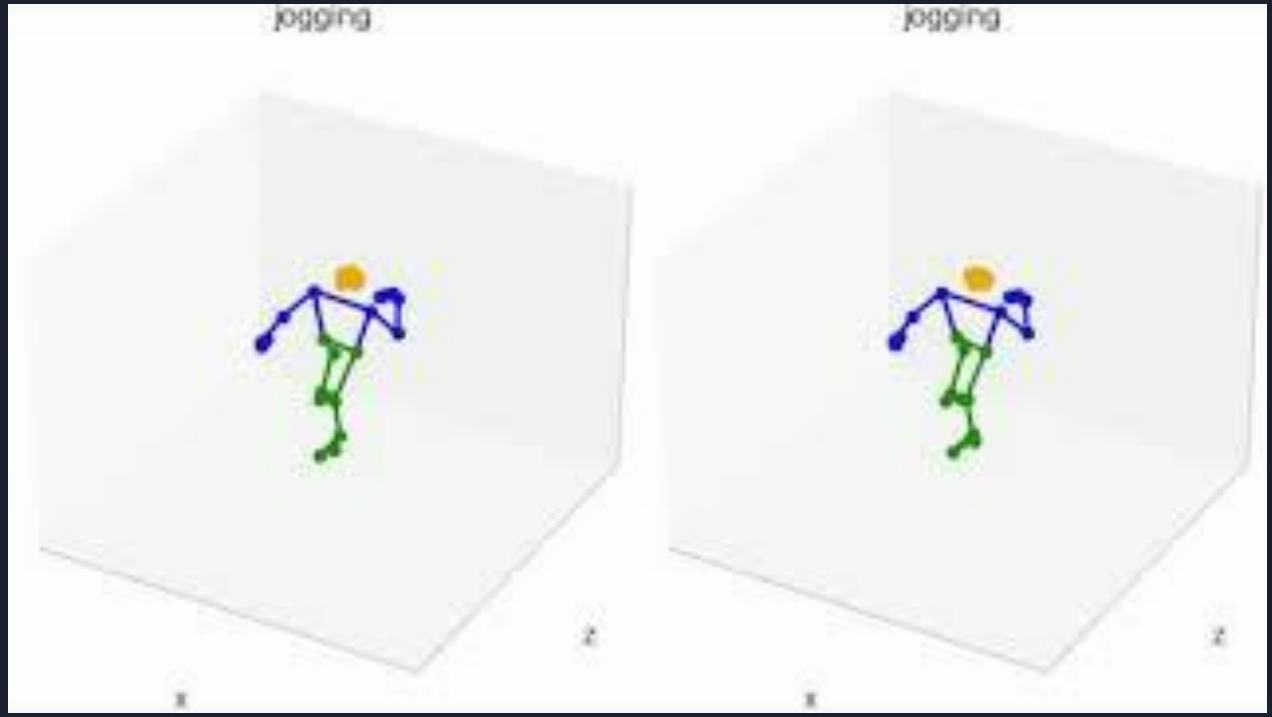


Our Model

- 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!