
OpenCap Manual

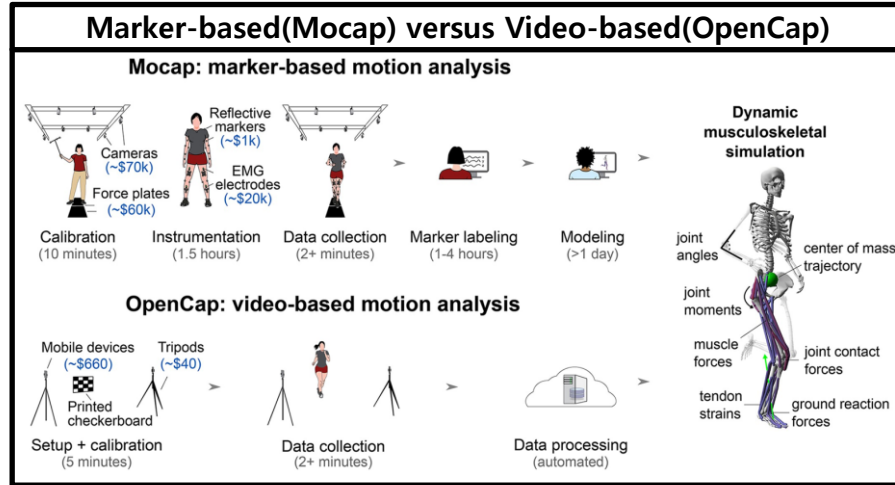
Version : 25.7.9

Author : Dongwoo Kim

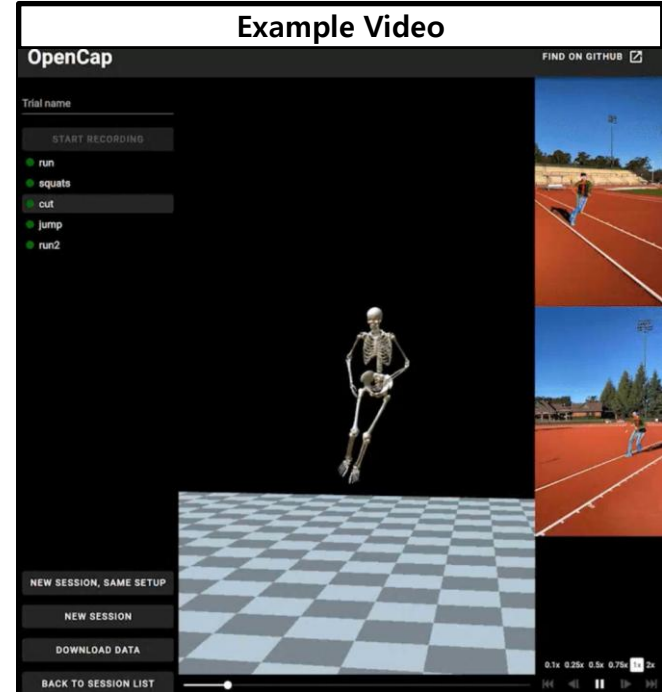
What is OpenCap

What is OpenCap

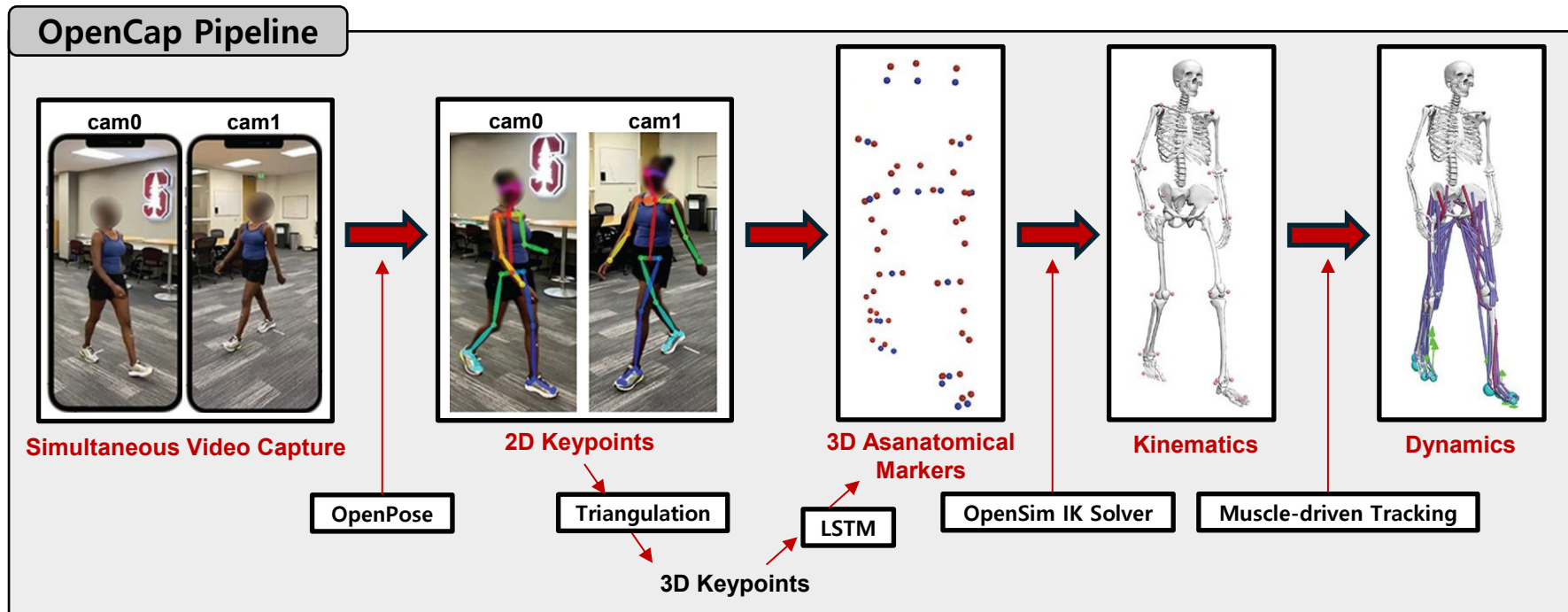
OpenCap : Motion Capture analyzes Human Movement Dynamics from two smartphone videos



OpenCap : Low Cost & Less Time

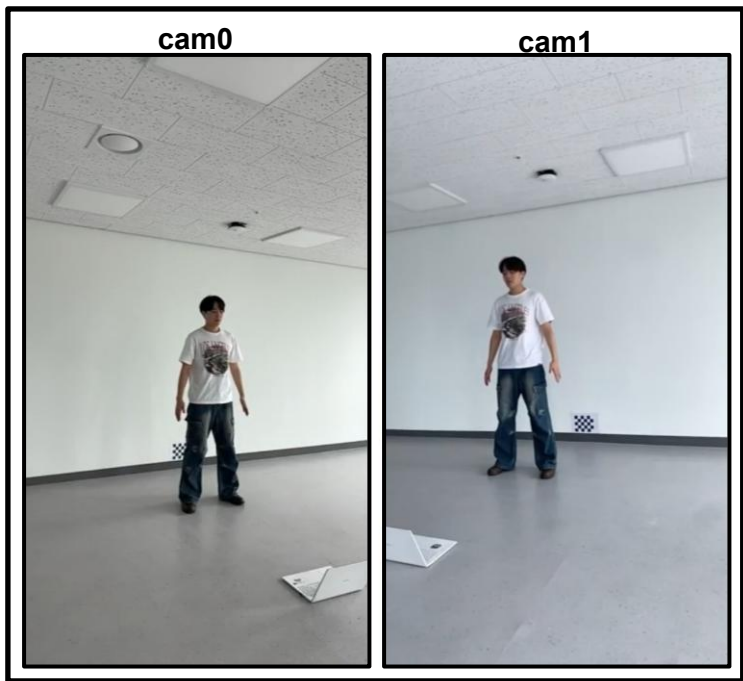


OpenCap Pipeline



OpenCap Experiment

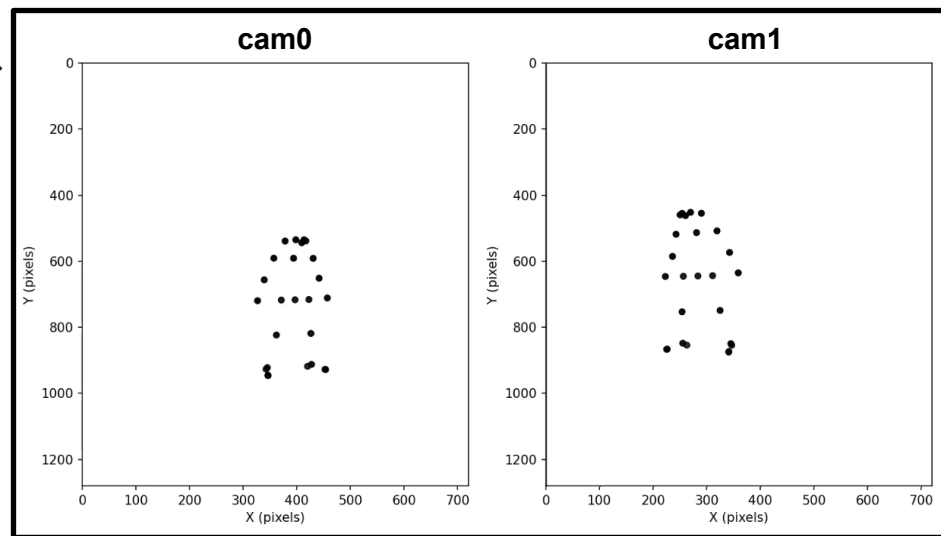
Motion : Squat



Simultaneous Video Capture



OpenPose



2D Keypoints

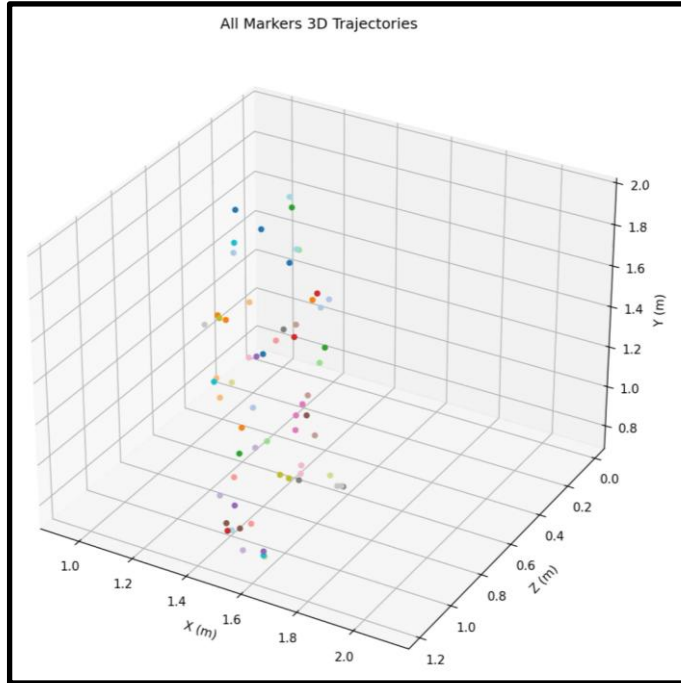
OpenCap Experiment

Motion : Squat

LSTM

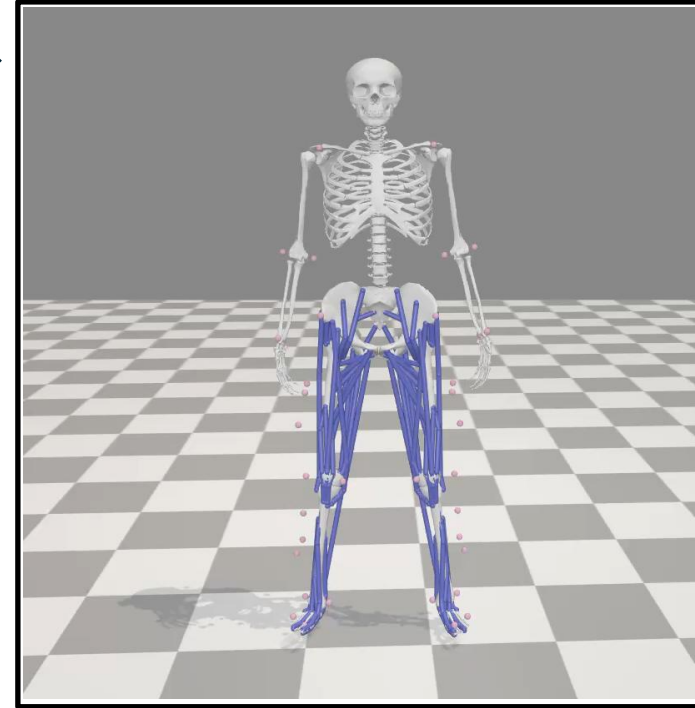
3D Keypoints

Triangulation



3D Anatomical Markers

OpenSim
IK Solver



Kinematics

How to Run OpenCap

OpenCap App Download

Download OpenCap at AppStore



OpenCap (4+)
Measure Human Movement
Model Health, Inc.
★★★★★ 5.0 • 2 Ratings
Free

Screenshots iPhone iPad



Download OpenCap on 2 or more iOS based devices



At least 2 iOS devices

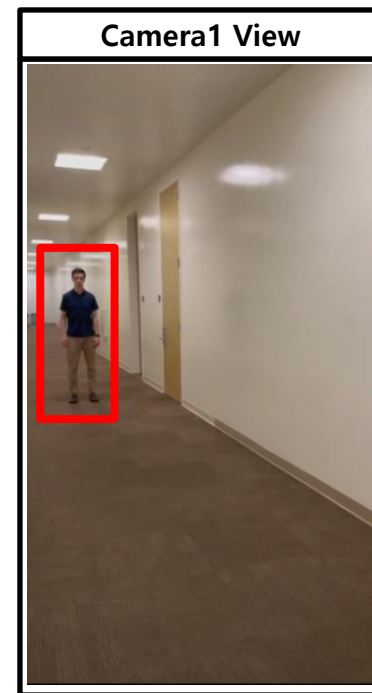
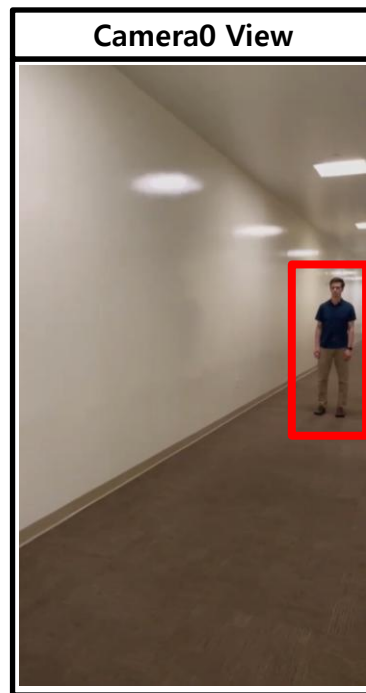
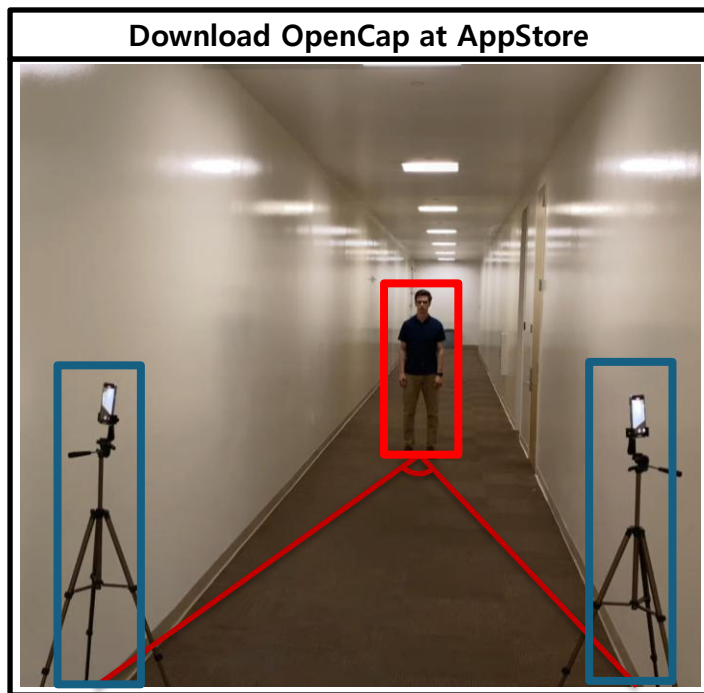
OpenCap supports all iPhones, iPads, and iPods released in 2018 or later.

Scan QR code displayed
on web app
(app.opencap.ai)

Check the App runs properly

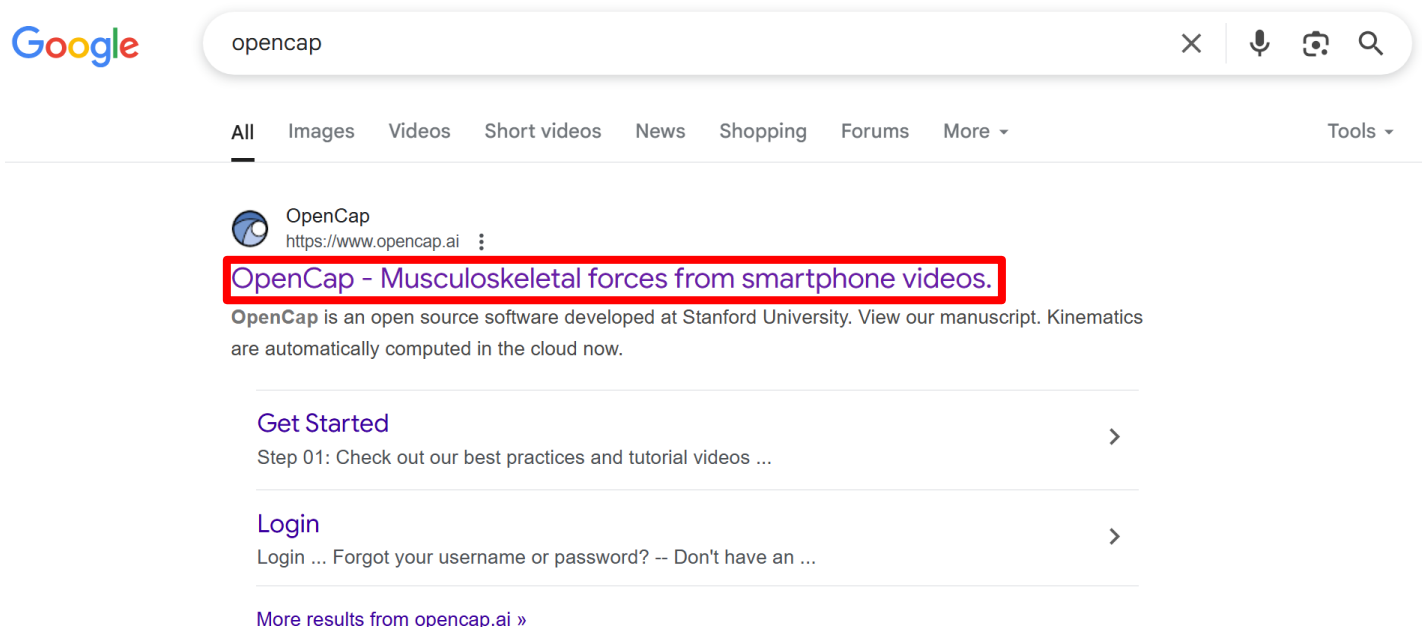
If you want to run OpenCap on more than 3 devices, You can download OpenCap on each device!

Camera Setup



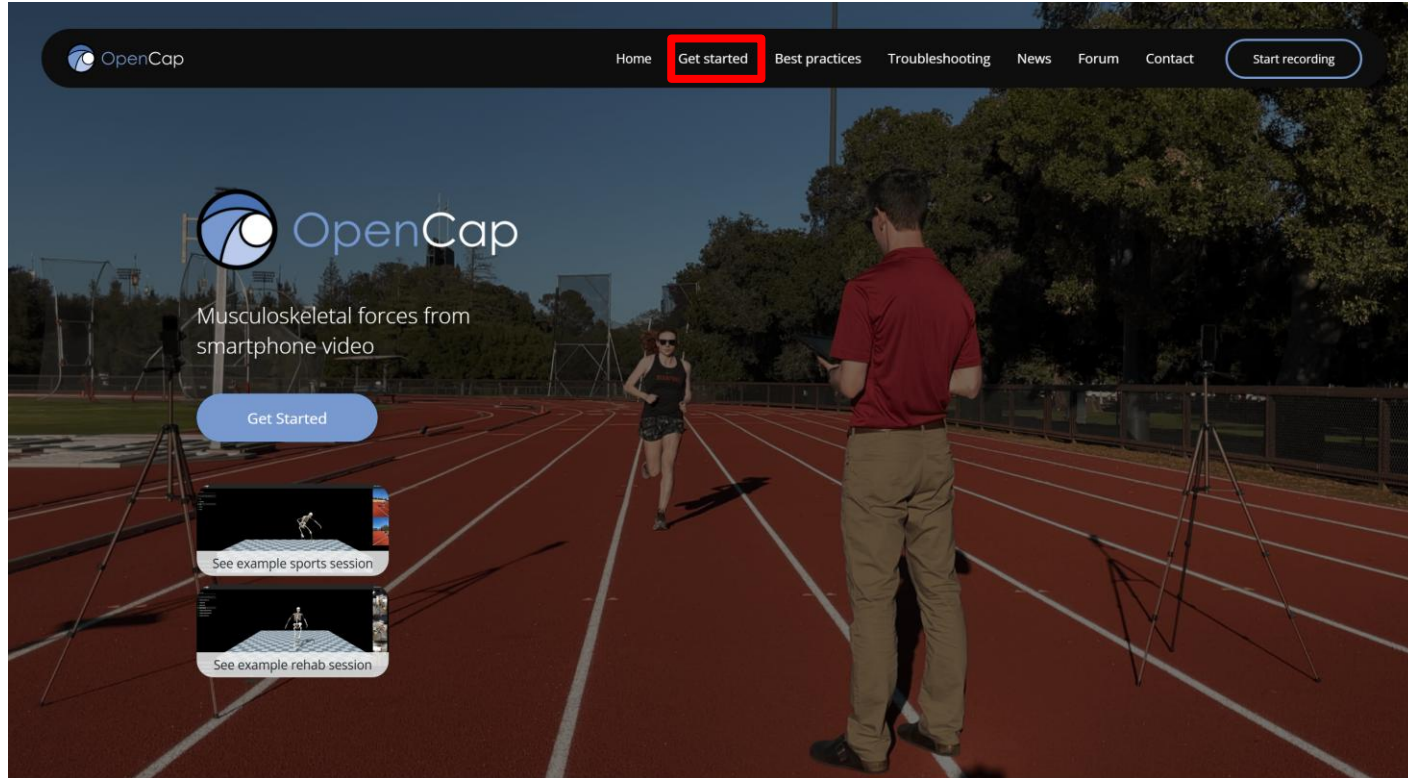
The **camera-person-camera** angle should be around 30~45 degrees, and each camera should clearly show the person.

Preparation Process Before Using OpenCap



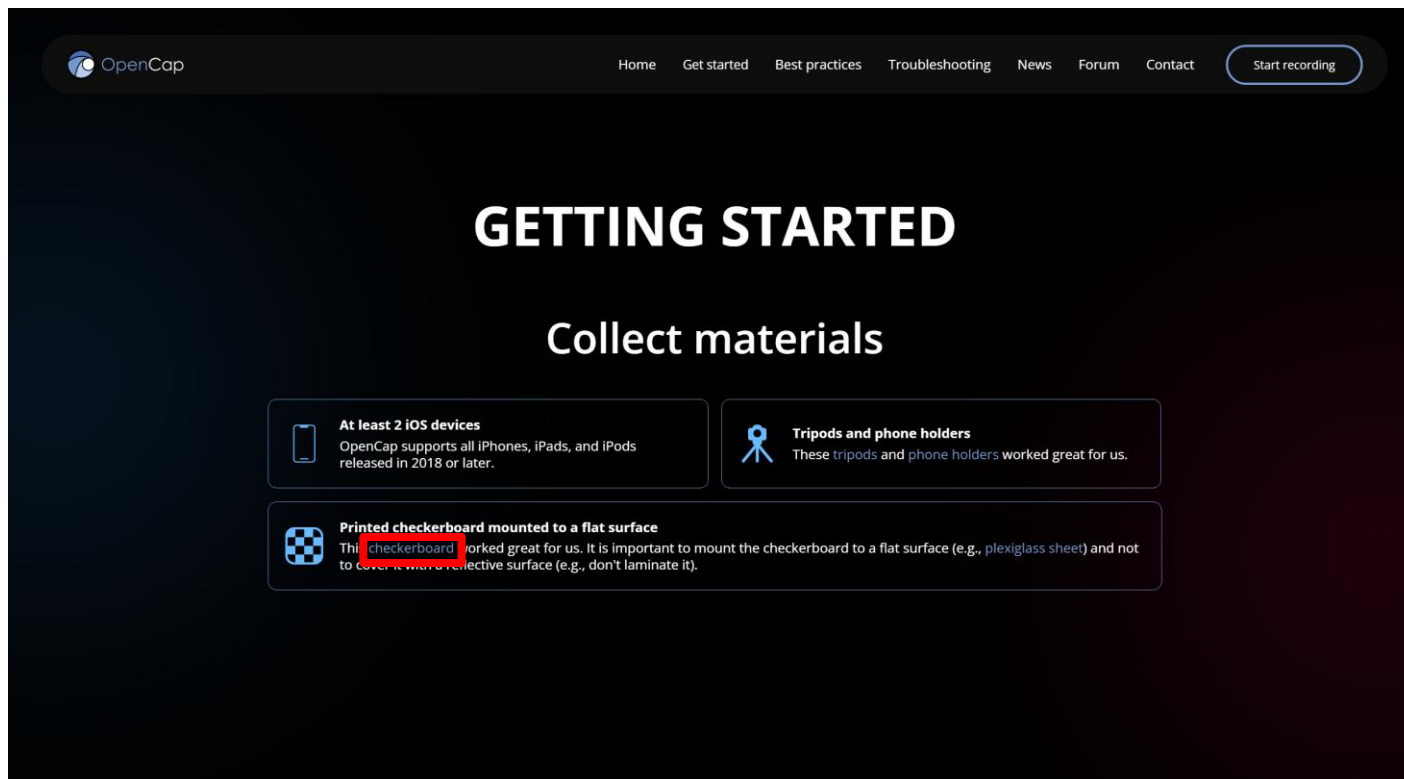
Search for “openCap” on Google and go to the OpenCap website.

Preparation Process Before Using OpenCap



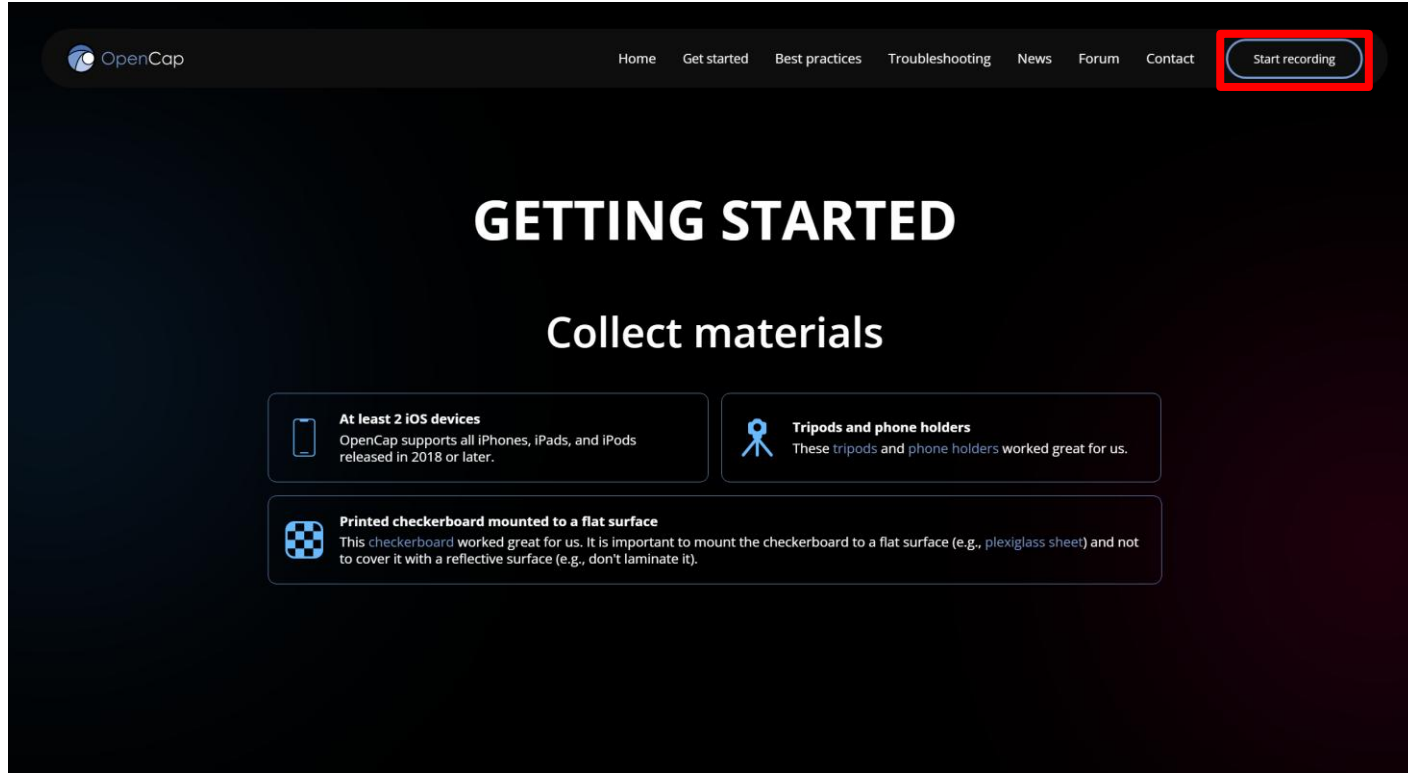
Click the “Get started” Icon.

Preparation Process Before Using OpenCap



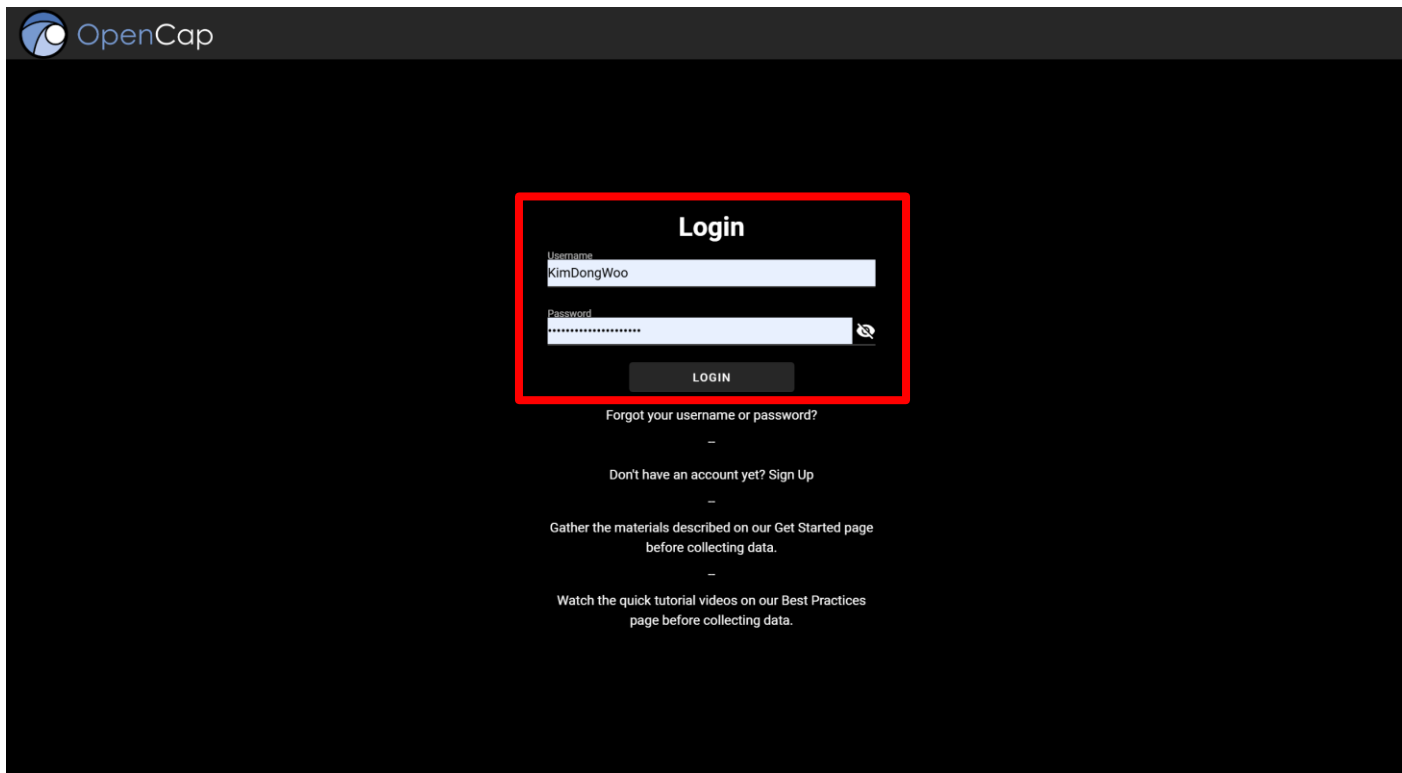
Click the “Checkerboard” Icon and print the checkerboard paper.

Preparation Process Before Using OpenCap



Click the “Start recording” Icon.

Preparation Process Before Using OpenCap



The image shows the OpenCap login interface. At the top left is the OpenCap logo. The main content area is dark gray. In the center, there is a white login form highlighted by a red rectangle. The form has a title 'Login', a 'Username' field with the text 'KimDongWoo', a 'Password' field with masked characters and an eye icon, and a 'LOGIN' button. Below the form, there are links for 'Forgot your username or password?', 'Don't have an account yet? Sign Up', and instructions to 'Gather the materials described on our Get Started page before collecting data.' and 'Watch the quick tutorial videos on our Best Practices page before collecting data.'

OpenCap

Login

Username
KimDongWoo

Password
.....

LOGIN

[Forgot your username or password?](#)

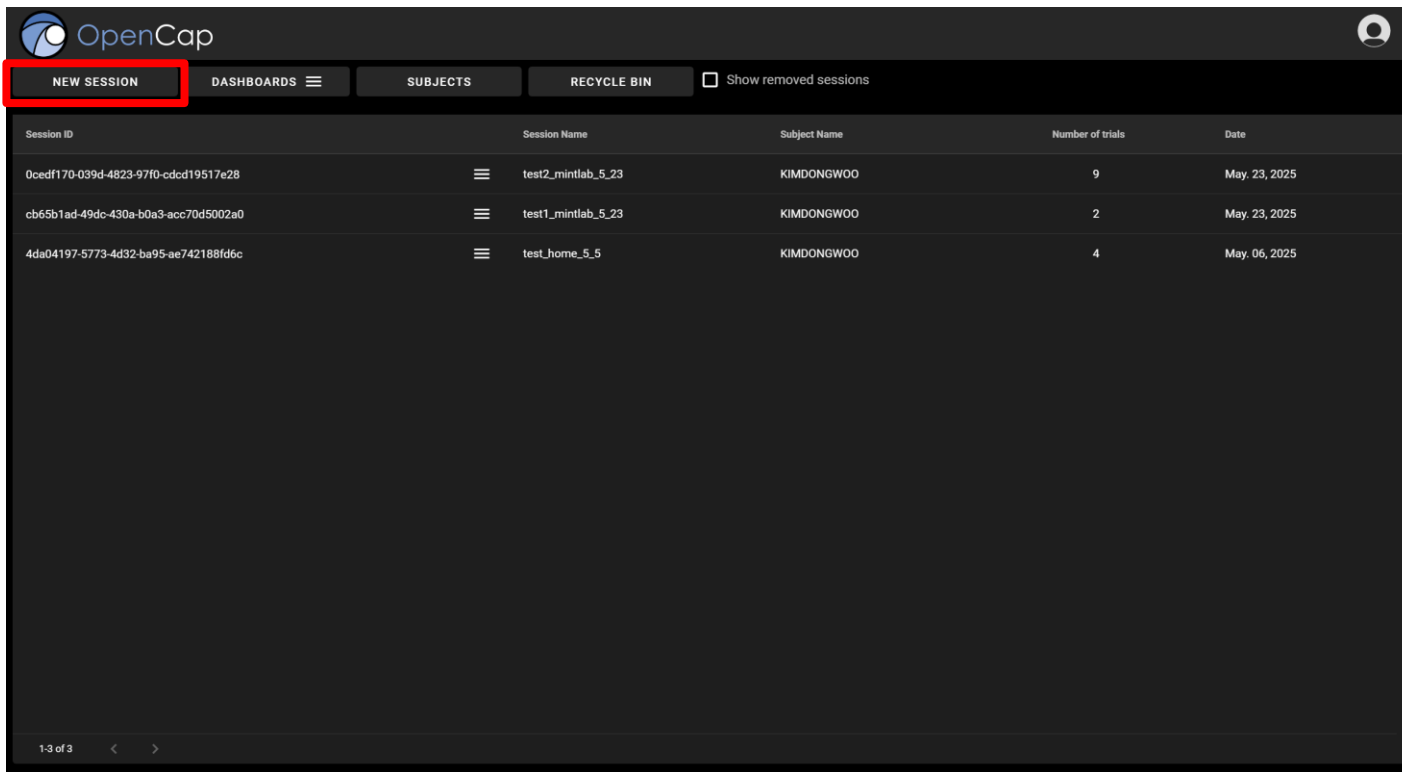
[Don't have an account yet? Sign Up](#)

Gather the materials described on our Get Started page before collecting data.

Watch the quick tutorial videos on our Best Practices page before collecting data.

Register and Log In.

Preparation Process Before Using OpenCap




The screenshot displays the OpenCap web application interface. At the top, the OpenCap logo is on the left, and a user profile icon is on the right. Below the logo, a navigation bar contains several buttons: 'NEW SESSION' (highlighted with a red box), 'DASHBOARDS' (with a hamburger menu icon), 'SUBJECTS', and 'RECYCLE BIN'. To the right of these buttons is a checkbox labeled 'Show removed sessions'. Below the navigation bar is a table with the following columns: 'Session ID', 'Session Name', 'Subject Name', 'Number of trials', and 'Date'. The table contains three rows of data. At the bottom left of the interface, there is a pagination indicator showing '1-3 of 3' with left and right arrow icons.


Session ID	Session Name	Subject Name	Number of trials	Date
0cedf170-039d-4823-97f0-cdd19517e28	test2_mintlab_5_23	KIMDONGWOO	9	May. 23, 2025
cb65b1ad-49dc-430a-b0a3-acc70d5002a0	test1_mintlab_5_23	KIMDONGWOO	2	May. 23, 2025
4da04197-5773-4d32-ba95-ae742188fd6c	test_home_5_5	KIMDONGWOO	4	May. 06, 2025

Click the “NEW SESSION” Icon.

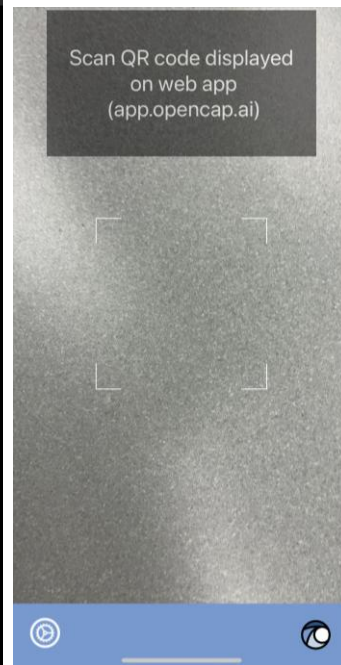
Camera Calibration

 OpenCap

1. Open the OpenCap app on your phone
2. Scan the QR code
3. Mount your phone vertically or horizontally (unlock portrait orientation) on a tripod
4. Position the tripod and camera to capture the volume of interest
5. Repeat 1-4 for all phones you want to connect
6. Have the person practice the activity and verify that they are fully in view of at least 2 cameras



NEXT

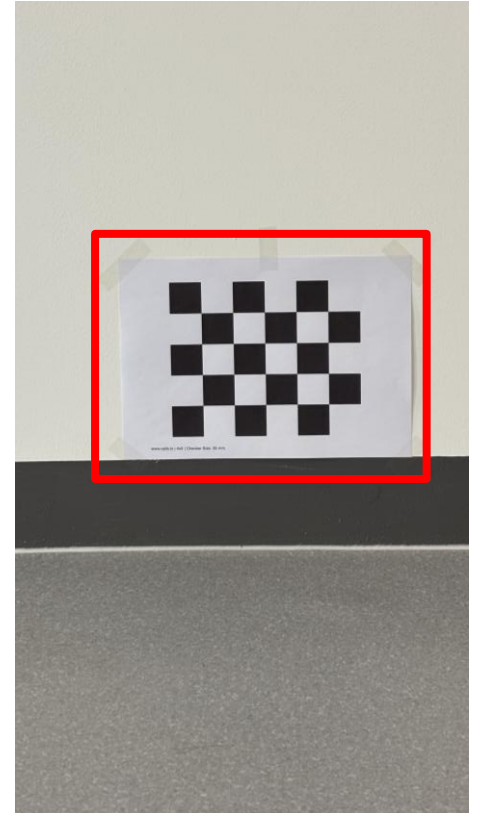


Scan the QR code displayed on web with your iOS devices.




Camera Calibration



The **checkerboard** should be set perpendicular to the ground,
And the **camera** should be set to look at the checkerboard.




Camera Calibration

RECONNECT PHONE  

0 of 0 videos uploaded.

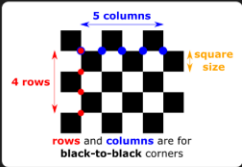
Place a checkerboard in the scene

- It should be visible by all cameras (nothing in the way of cameras' view when hitting Calibrate)
- It can be either perpendicular to the floor (default) or lying on the floor (beta feature; select Lying placement below)
- If perpendicular to the floor, then:
 - Place it horizontally (longer side on the floor)



Provide the checkerboard details

Rows	Columns	Square size (mm)	Placement on the floor	
4	5	35	Perpendicular	?

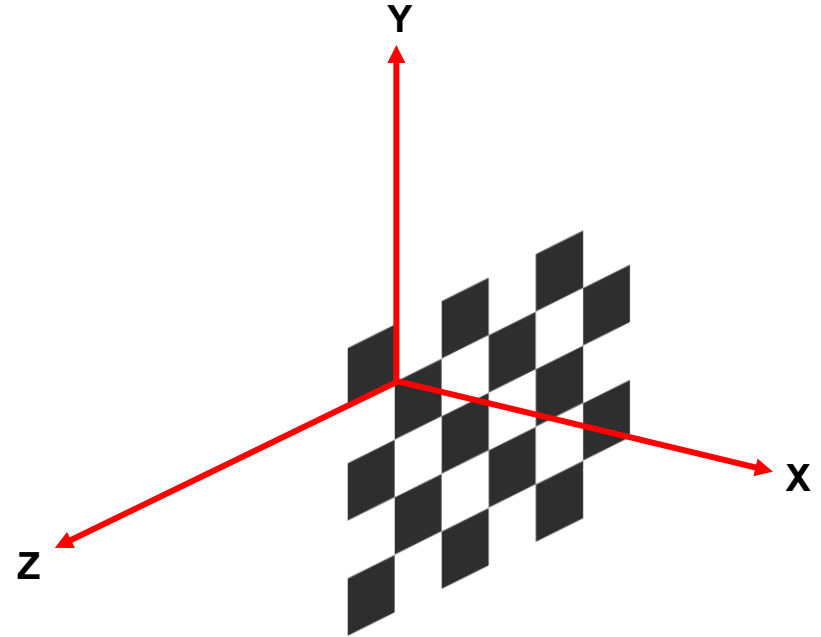
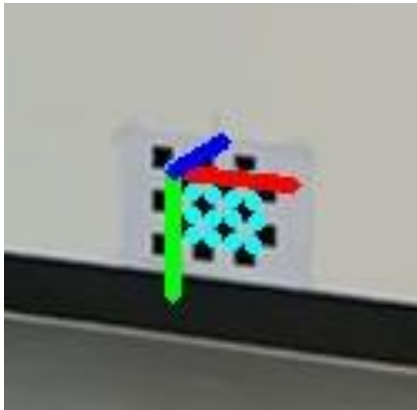
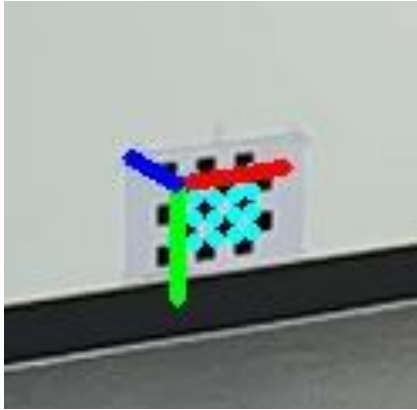


BACK

CALIBRATE




Click the “CALIBRATE” Icon. Calibration will take a few minutes.

After Camera Calibration



After calibration, a new world coordinate system is completed.
(Ignore the coordinate system in the photos, it is for calibration purposes.)

Record Neutral Pose

RECONNECT PHONE  

Session Info

Subject

KIMDONGWOO (72.0 Kg, 1.81 m, 2002)

+

Session Name (optional)

Data sharing agreement

The subject understands that the recorded identified videos and processed data are stored in secure PHI-compliant storage and agrees to share them with the OpenCap development team for algorithm development. We may use this data in scientific publications, but will only publicly share the data that the subject agrees to share below.

☒ ☐

Please select which data the subject is willing to share publicly, we encourage the subject to share as much as they feel comfortable.

Share no data


ADVANCED SETTINGS

0 of 2 videos uploaded

Record neutral pose

- The subject should adopt the example neutral pose
 - Upright standing posture with feet pointing forward
 - Straight back and no bending or rotation at the hips, knees, or ankles
- The subject should stand still
- The subject should be visible by all cameras
 - Nothing in the way of cameras view when hitting Record

Example neutral pose



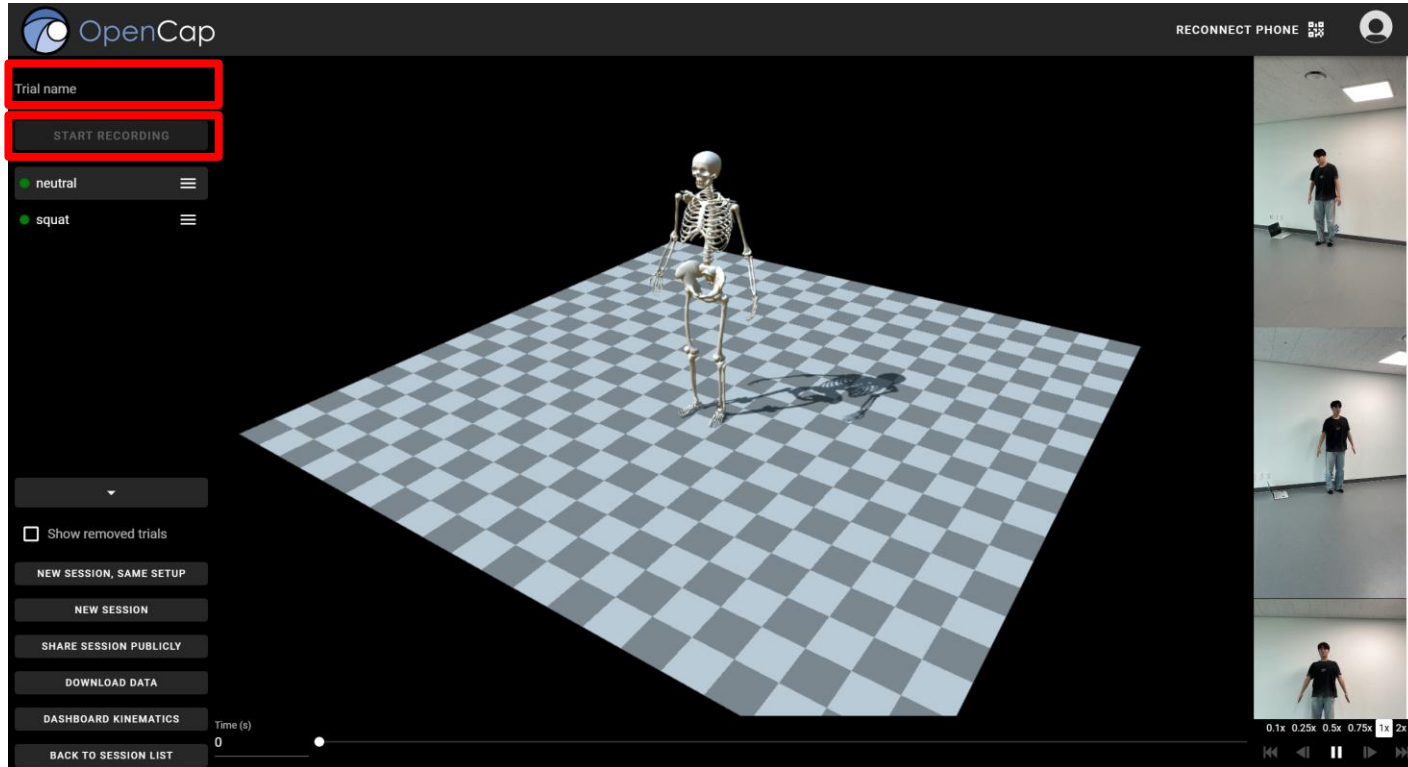
If the subject cannot adopt the example neutral pose, select "Any pose" scaling setup under Advanced Settings

BACKRECORD



Enter your body information and Check the “Data sharing agreement”.
Take a neutral pose and Click the “RECORD” Icon.

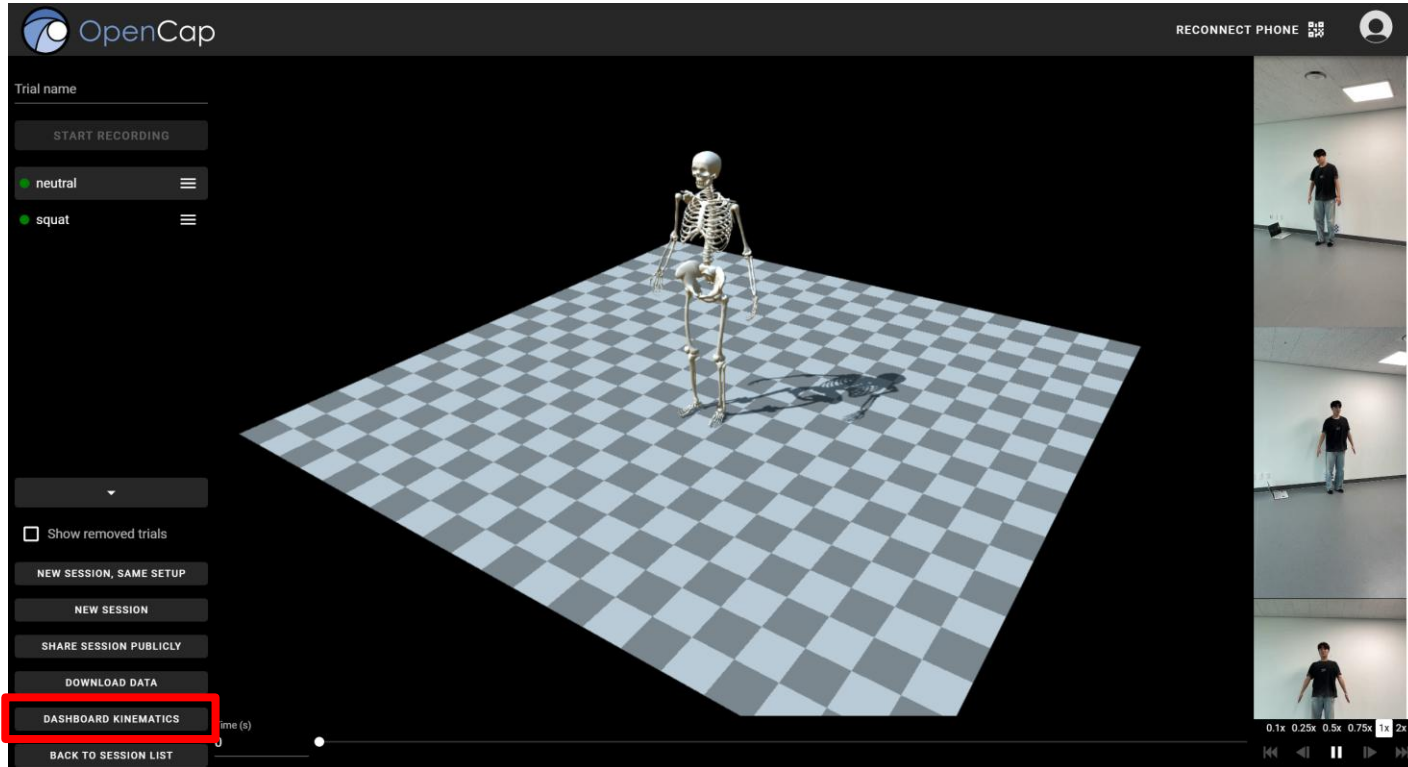
Record Action



Enter an action name in "Trial name" and Click the "START RECORDING" Icon to record the action. You can record multiple actions.

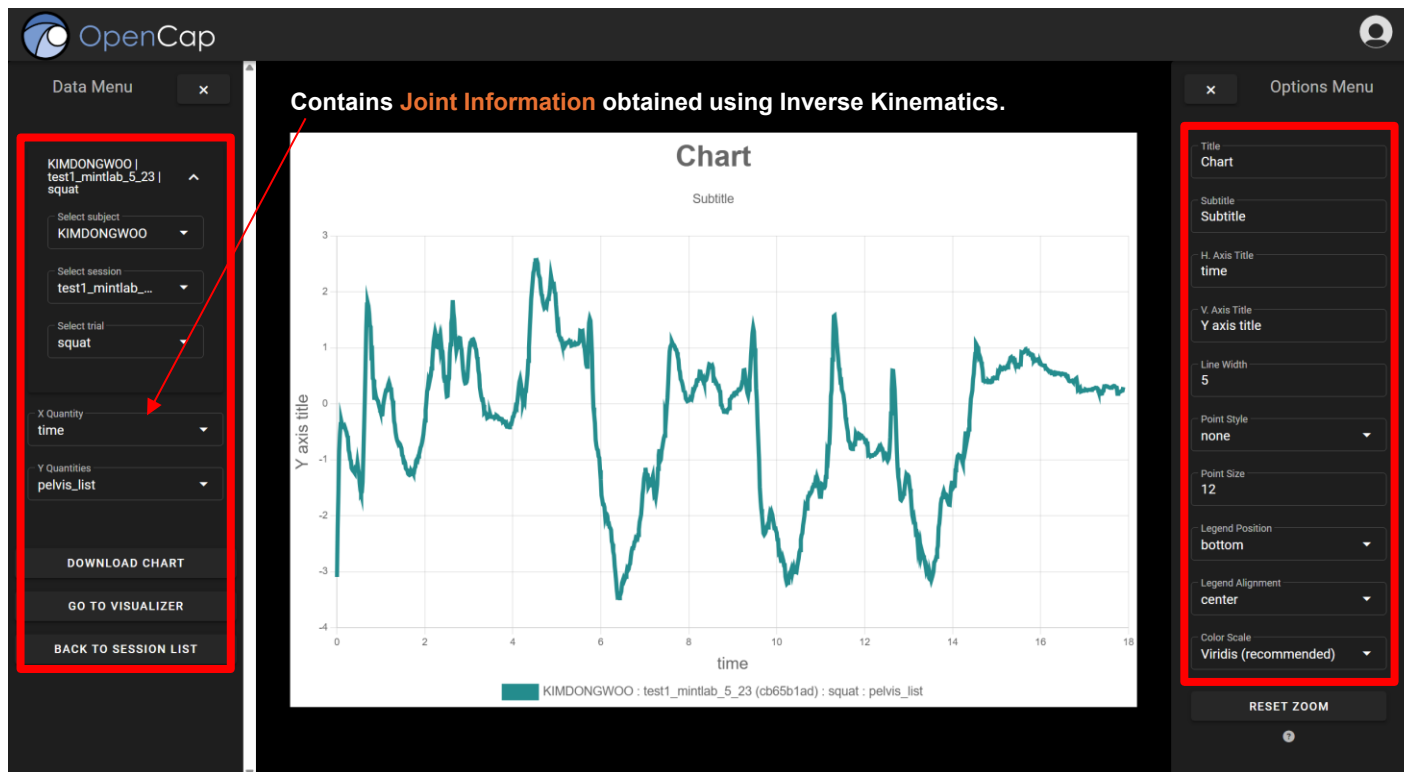
Analyzing Results on the Website

Analyzing Results on the Website



After Recording Action, you can analyze the results on the web by clicking the "DASHBOARD KINEMATICS" Icon.

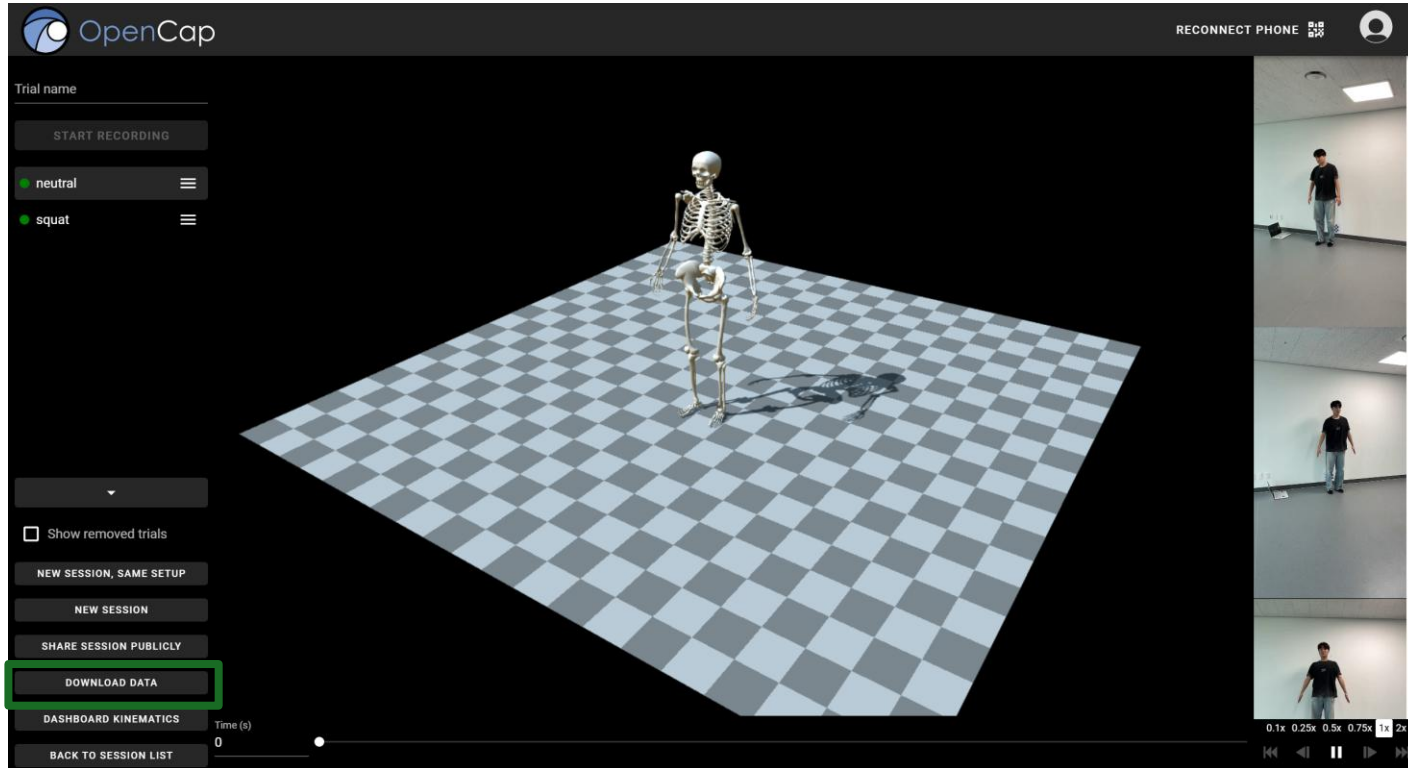
Analyzing Results on the Website



You can Analyze the Results by selecting the data you want to see from the Left & Right Icon Bars.

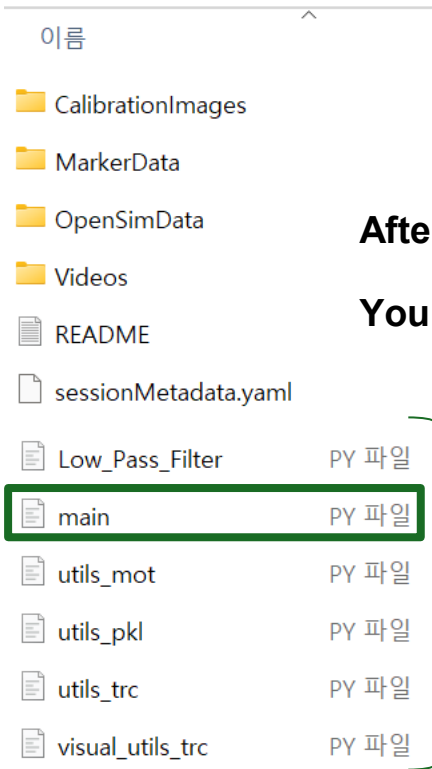
Analyzing Results on the Local

Analyzing Results on the Local



You can download the data and Analyze the Results on the Local.

Analyzing Results on the Local



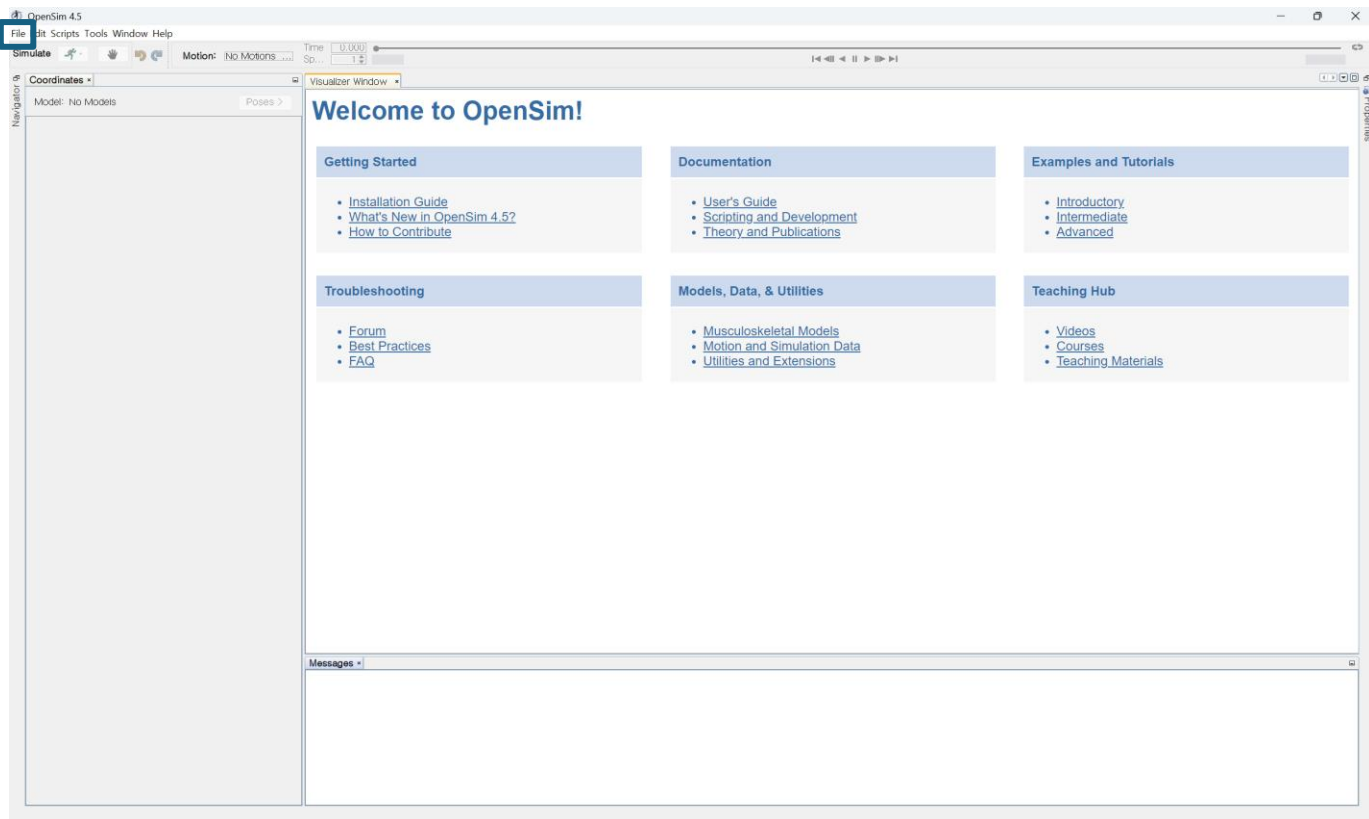
After unzipping **Analyzing_Results_Utils.zip** to the **Results** folder, Run **main.py**.

You can analyze the **2D Keypoints** / **3D Anatomical Markers** / **Kinematics** Data.

Please read the comments on **main.py** carefully.

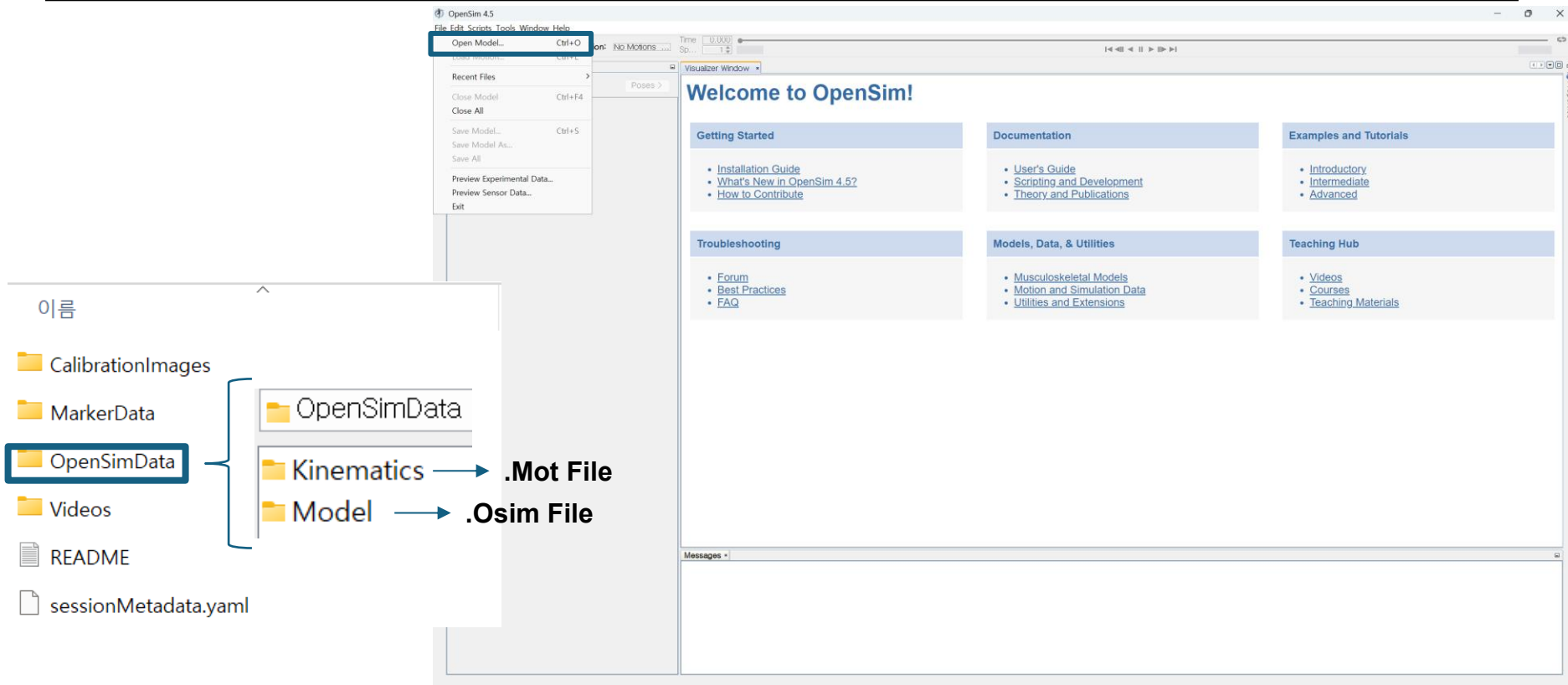
Analyzing Results on the OpenSim

Analyzing Results on the OpenSim



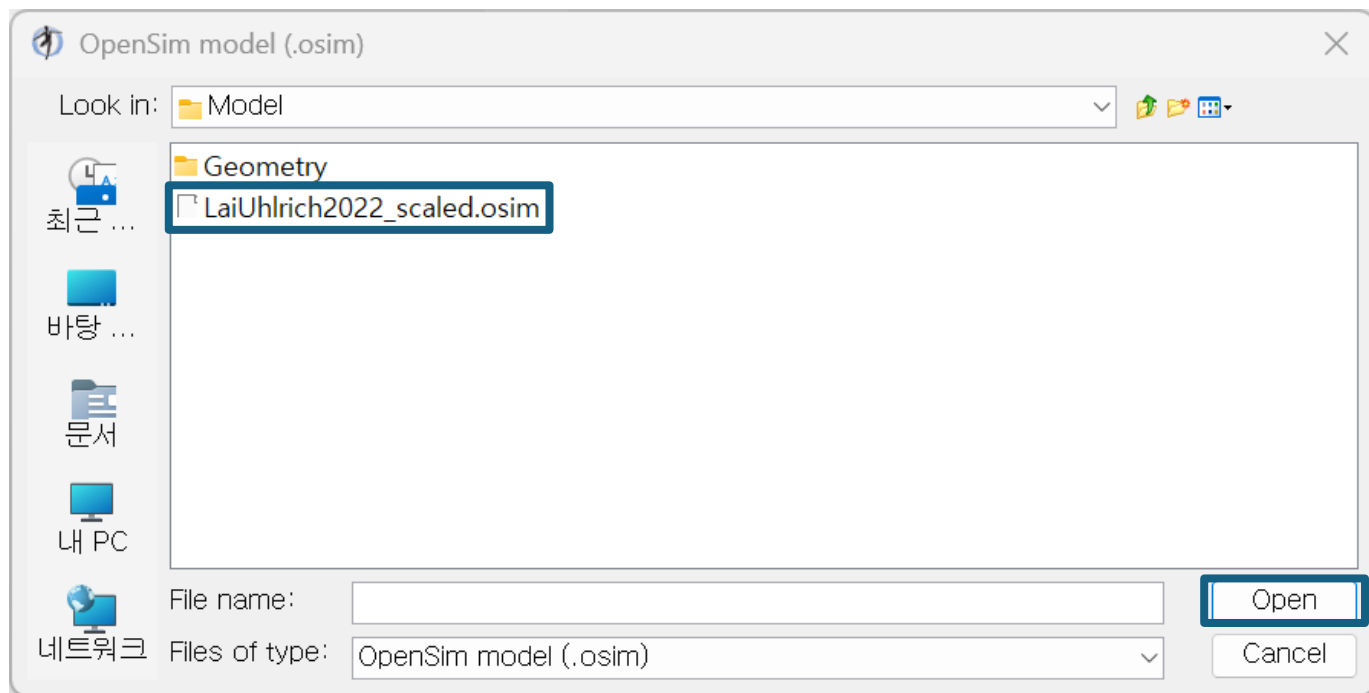
Click the “File” Icon.

Analyzing Results on the OpenSim



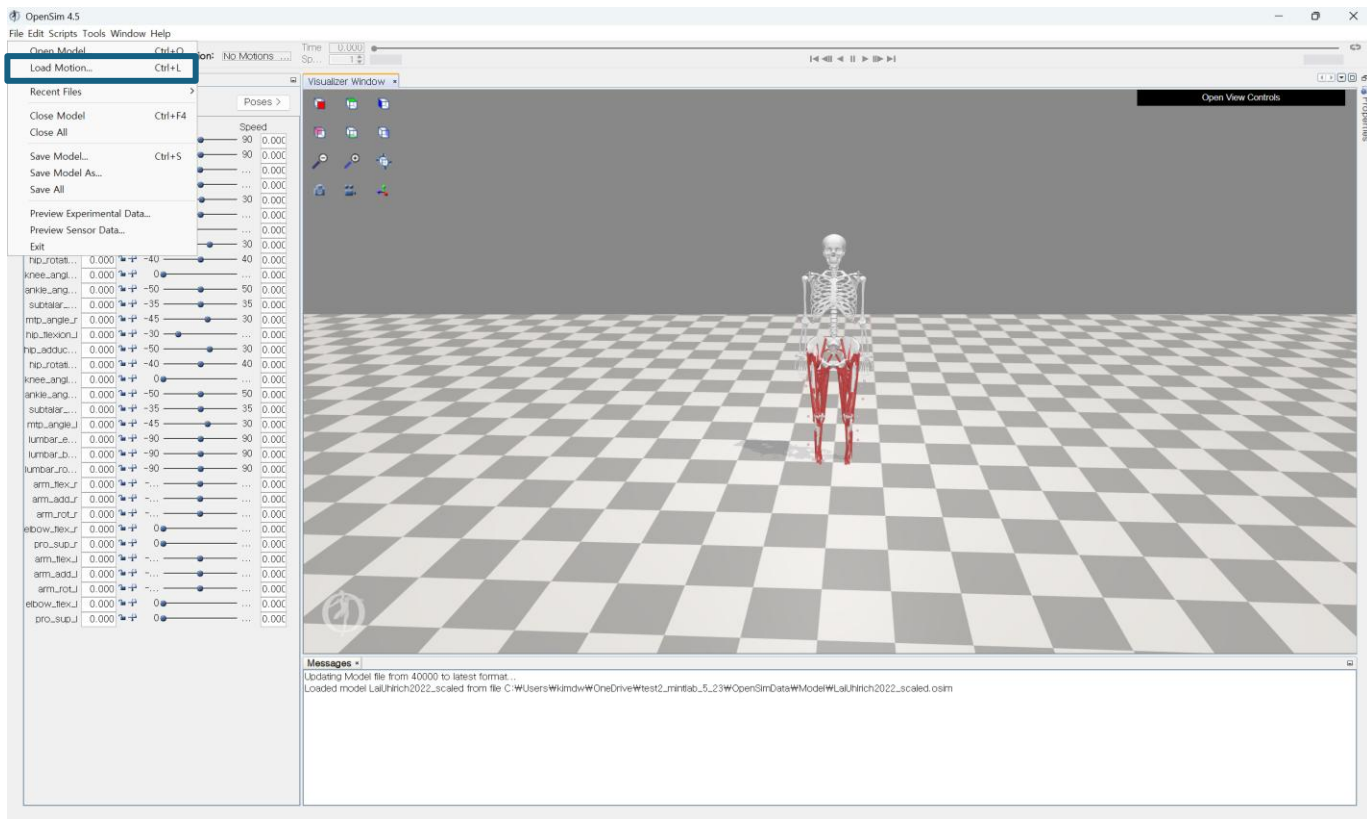
Click the “Open Model” Icon to load the osim file.

Analyzing Results on the OpenSim



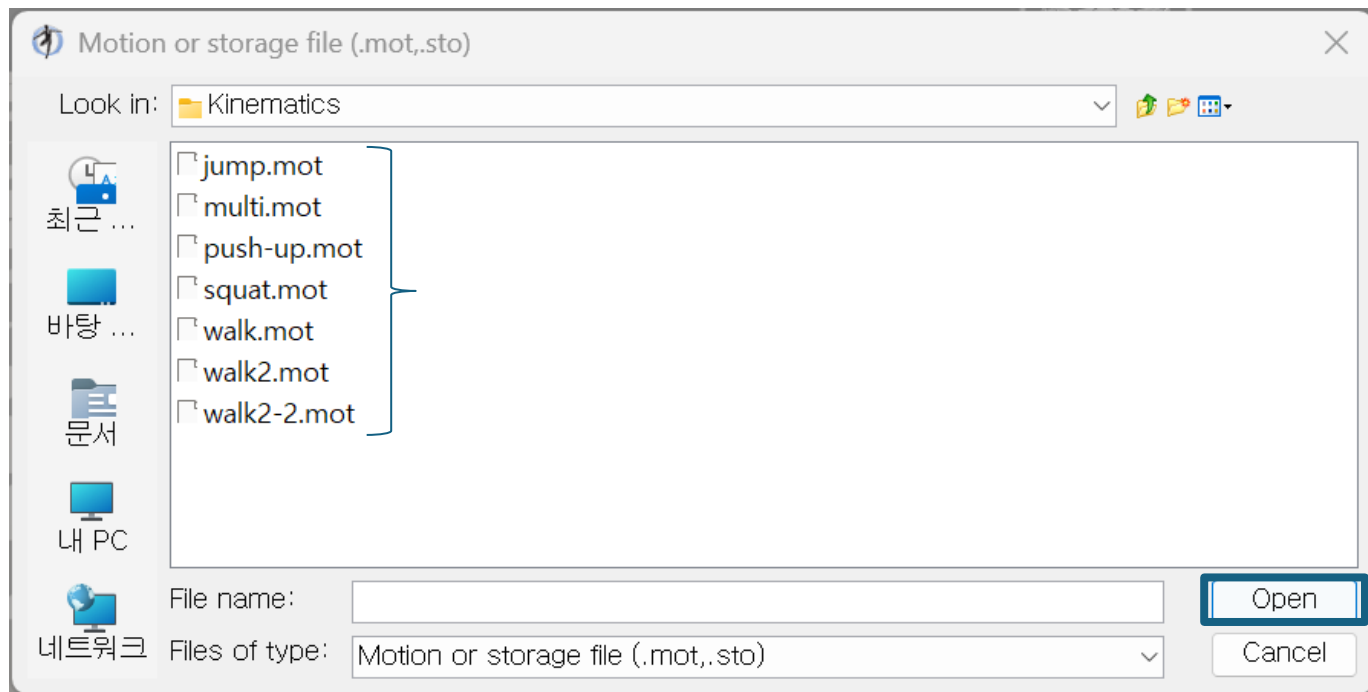
Select the osim file in OpenSimData/Model and click the "Open" Icon.

Analyzing Results on the OpenSim



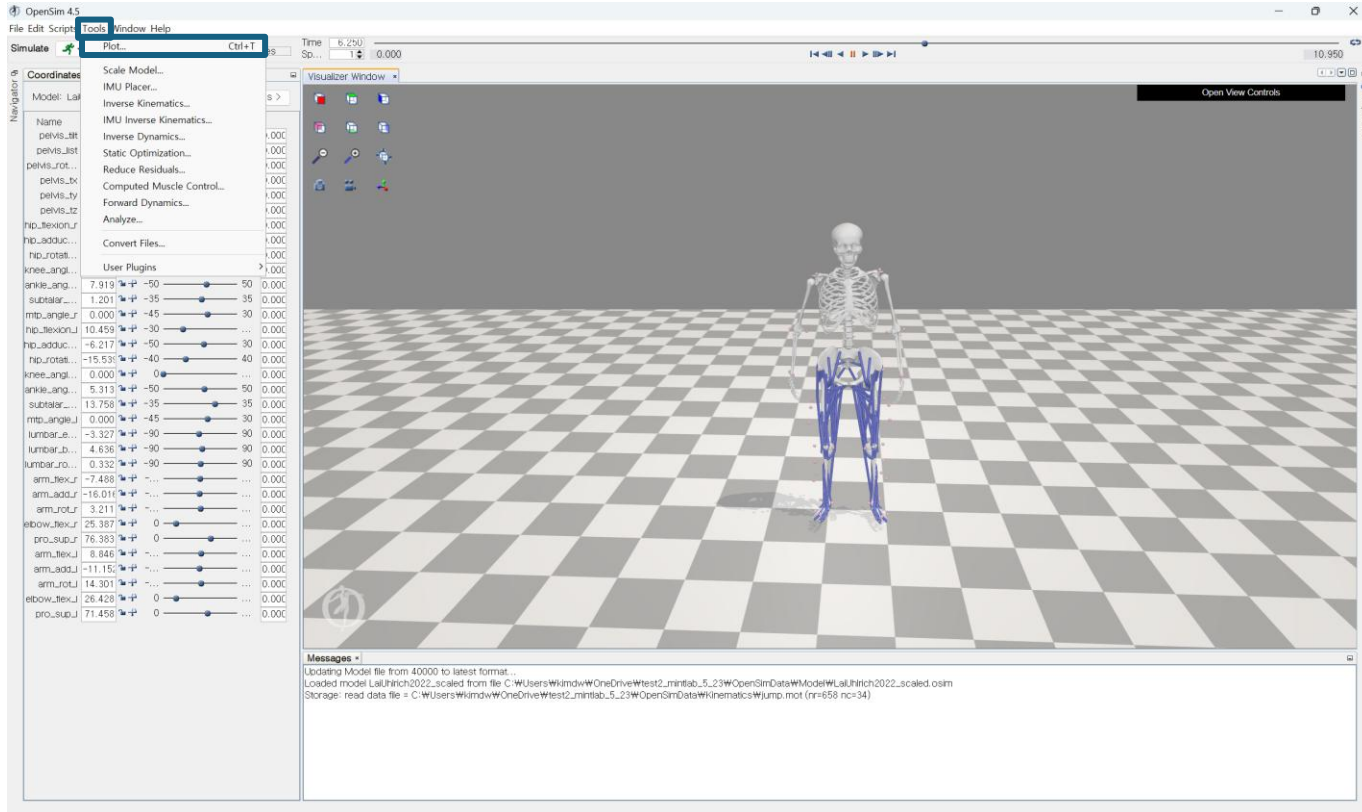
Click the “Load Motion” Icon to load the mot file.

Analyzing Results on the OpenSim



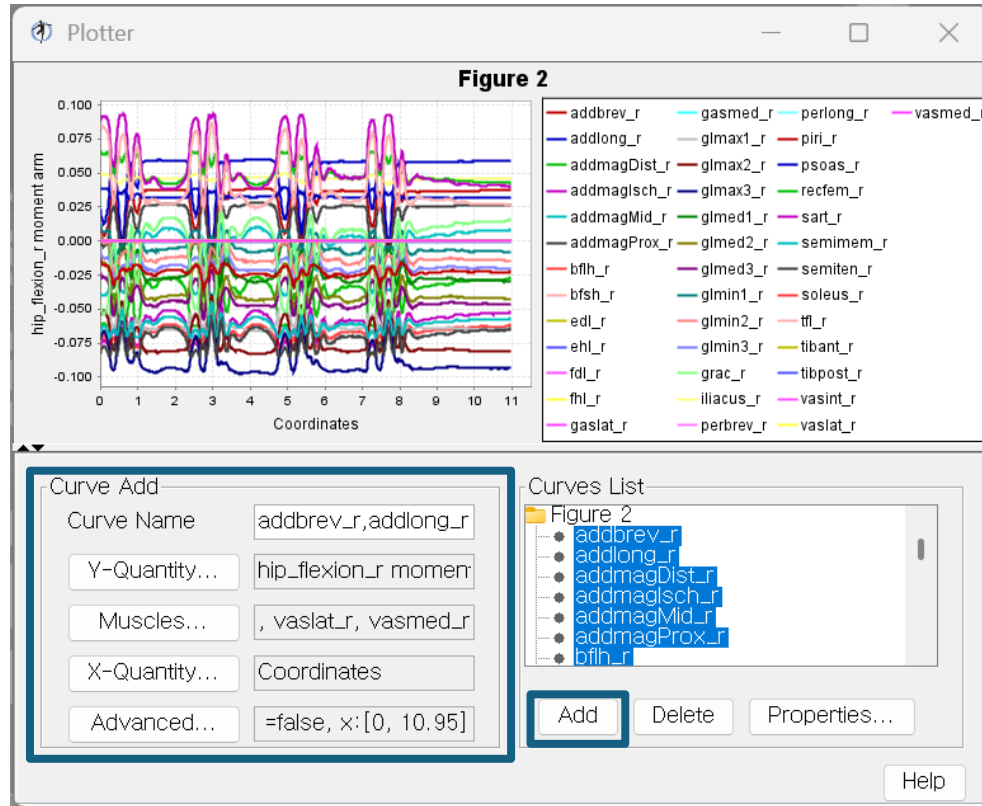
Select the mot file of the desired motion from OpenSimData/Kinematics and click the "Open" Icon. 33

Analyzing Results on the OpenSim



Click the “Tools” Icon and Click the “Plot” Icon

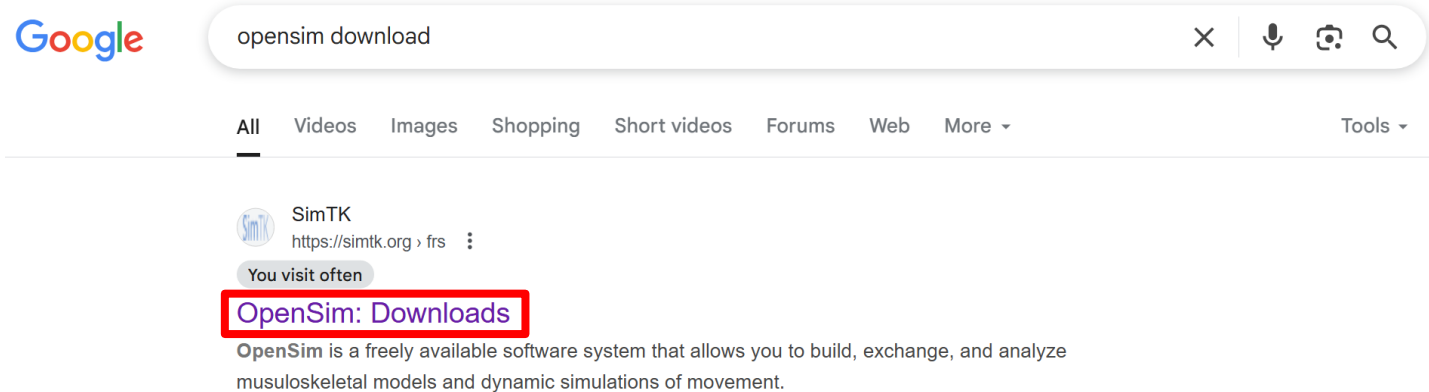
Analyzing Results on the OpenSim



Enter the desired information in “Curve Add” and click the “Add” Icon.

How to Download OpenSim

How to Download OpenSim



Search for “opensim download” on Google and go to the OpenSim Downloads website.

How to Download OpenSim



OpenSim

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OpenSim

OpenSim is a freely available software system that allows you to build, exchange, and analyze musculoskeletal models and dynamic simulations of movement.

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OpenSim 4.5

JAN 10, 2024

We are pleased to announce the following new features, bug fixes, and other improvements in OpenSim 4.5. The new software includes improvements to the look and feel of the GUI, published Conda and Docker packages, additional Moco functionality, and the introduction of FunctionBasedPath for function-based muscle wrapping. We also now distribute a version of the Rajagopal model with the OpenSim resources folder included in the OpenSim application. Release notes are provided below along with links to full change logs for more detail. [Notes](#) [View License](#)

[Download Links](#)

OpenSim-4.5-win64.exe

MAR 29, 2024

285 MB Windows Application/binary

Installer for OpenSim 4.5 application on Windows (Only x64 Windows machines are supported)

851,052

downloads

25188

forum posts

314

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Last updated

Jun 17, 2025

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Scott Delp




Jennifer Hicks

Linux version **X** →

Click on “Download Links” for OpenSim 4.5 and Click on “OpenSim-4.5-win64.exe”.

How to Download OpenSim



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SimTK is maintained through Grant R01GM124443 01A1 from the National Institutes of Health (NIH). It was initially developed as part of the Simbios project funded by the NIH as part of the NIH Roadmap for Medical Research, Grant U54 GM072970.

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Please describe how you expect to use this software:

It is intended to be used with [OpenCap](#).

License Agreement:

OpenSim is a toolkit for musculoskeletal modeling and simulation, developed as an open source project by a worldwide community. Development and support is coordinated from Stanford University, with funding from the U.S. NIH and DARPA. See <http://opensim.stanford.edu> and the README file for more information including specific grant numbers.

Copyright (c) 2005-2022 Stanford University and the Authors

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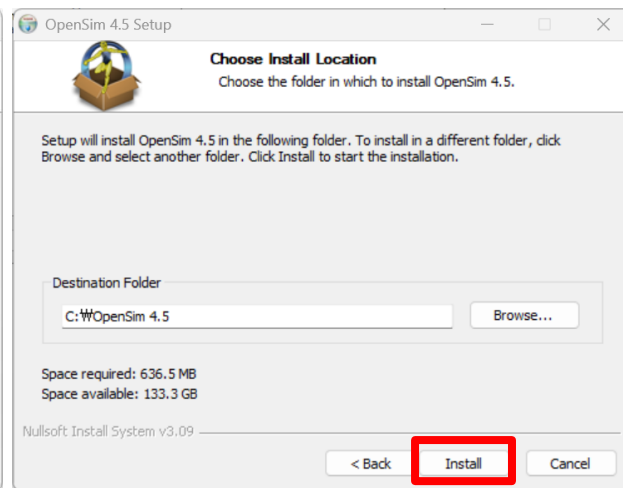
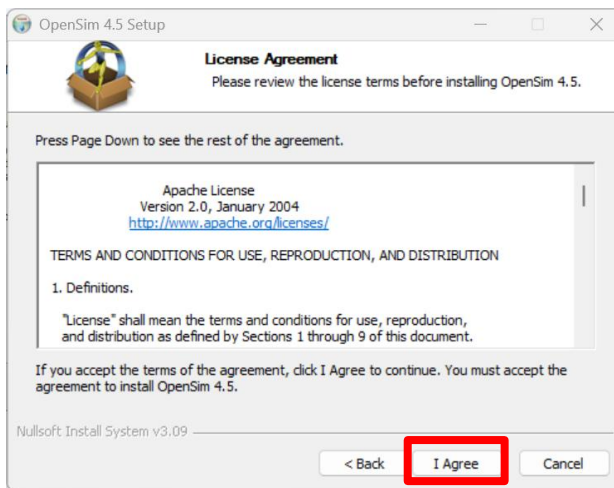
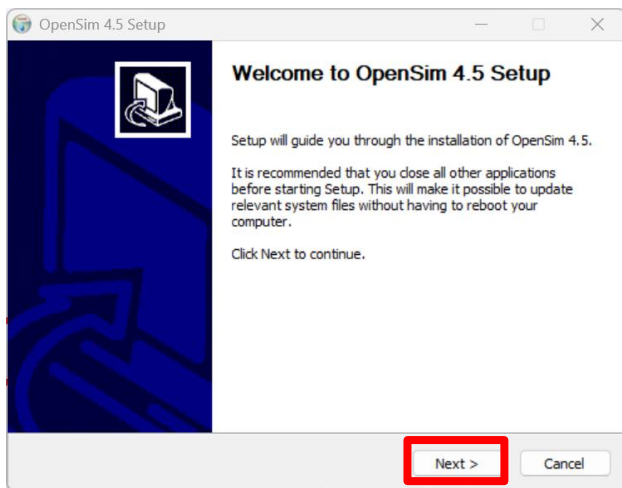
Click the “I Agree & Download Now” Icon to start downloading.

How to Download OpenSim

이름	수정한 날짜	유형	크기
▼ 오늘			
 OpenSim-4.5-win64	2025-06-23 오후 1:25	응용 프로그램	290,494KB

Run the executable file.

How to Download OpenSim



Thank You

Author : Dongwoo Kim

If you have any questions, please email me at dnehd4331@naver.com