



BCO 609 Uygulamalı Hareket Analizi

Aktör Kalibrasyonu



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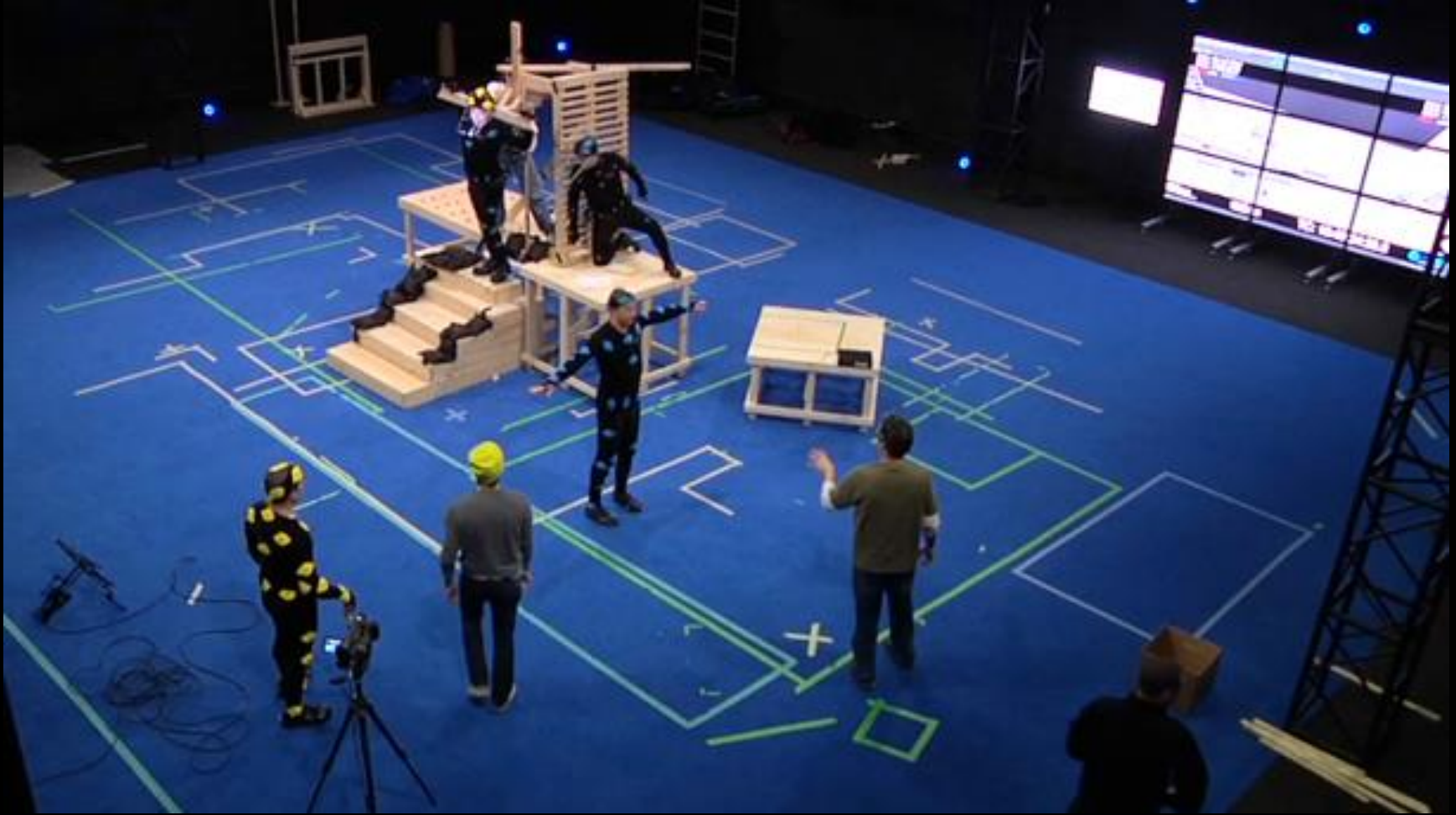


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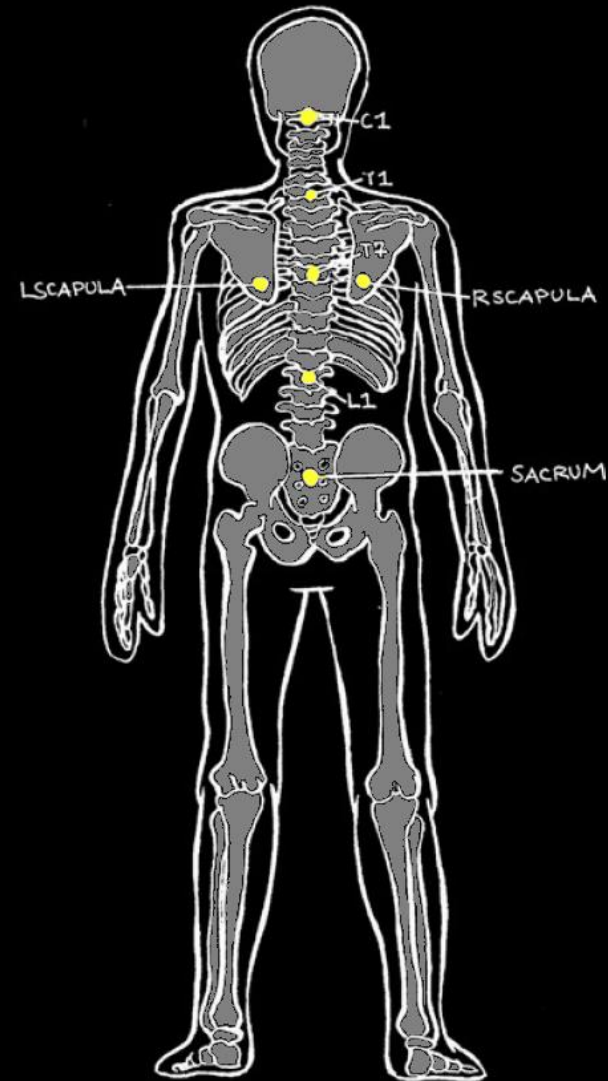
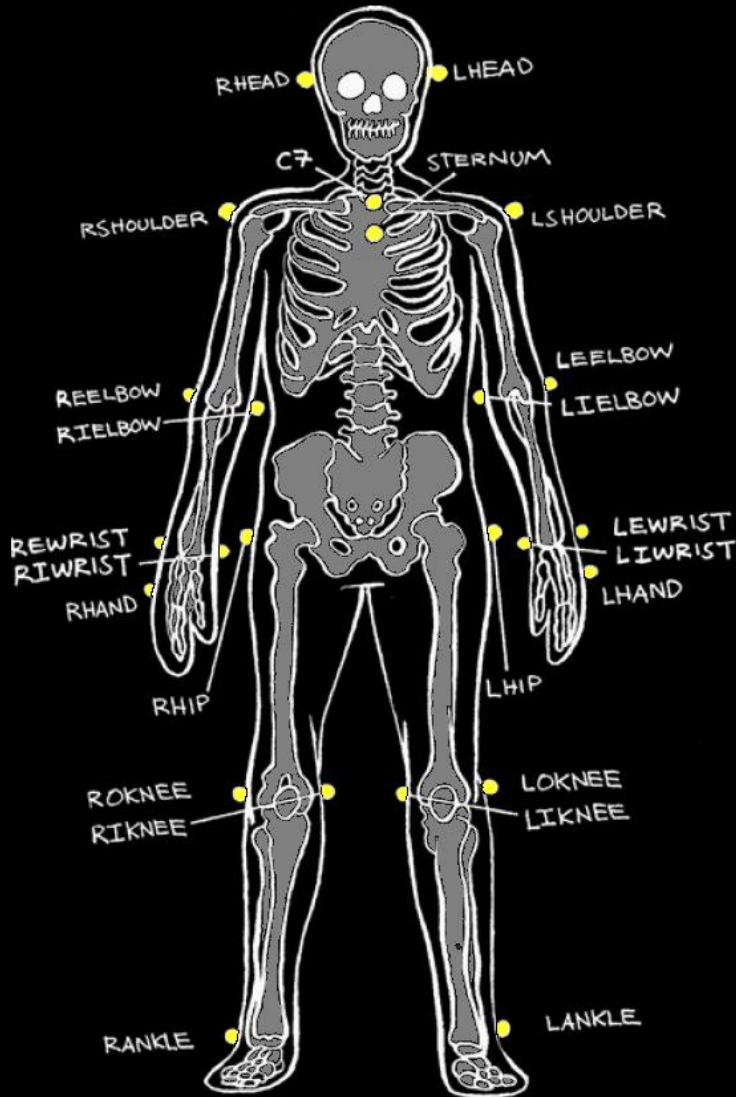




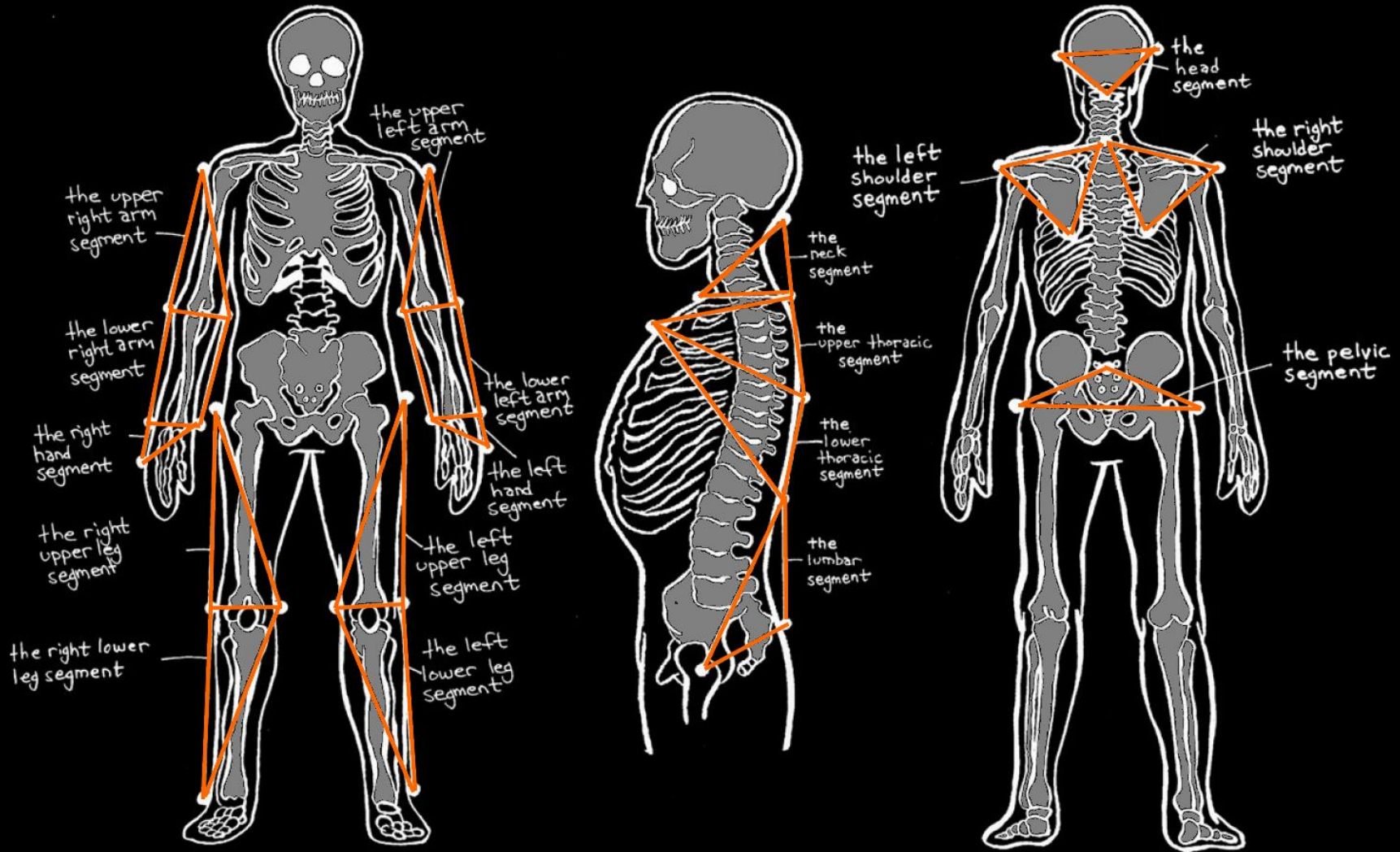
AKTÖR KALİBRASYONU



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Marker placement for the Blade default marker set.

The Blade default marker set comprises of **53** compulsory markers and optional finger markers (3 on each hand). Mid waist markers are also optional if using the AutoVST MakeVST script.

The .vst files for these marker sets are installed with Blade to the directory:

C:\Program Files\Vicon\Blade1.x\Templates

There are 8 files in total:

BladeDefault.vst – Mid waist at sides, Blade bone names.

BladeDefault_Fingers.vst – Mid waist at sides, finger markers, Blade bone names.

BladeDefault_FrontBackWaist.vst – Mid waist at front/back, Blade bone names.

BladeDefault_FrontBackWaist_Fingers.vst – Mid waist at front/back, finger markers, Blade bone names.

BladeDefault_MBnames.vst– Mid waist at sides, Motion Builder bone names.

BladeDefault_MBnames_Fingers.vst– Mid waist at sides, finger markers, Motion Builder bone names.

BladeDefault_MBnames_FrontBackWaist.vst– Mid waist at front/back, Motion Builder bone names.

BladeDefault_MBnames_FrontBackWaist_Fingers.vst– Mid waist at front/back, finger markers, Motion

Builder bone names.

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Marker names and descriptions.

(A) Auxiliary or Asymmetry markers. Should provide a way to marker up multiple performers differently, and also provide asymmetry between the left and right sides of a performer.

(O) Optional in the AutoVST options.

The four markers should be in the same plane, the fifth (ARIEL) should provide asymmetry and can be placed anywhere on the top of the **head**.

- 1 LFHD – Left Front Head (Left temple)
- 2 LBHD – Left Back Head (Behind and above left ear)
- 3 RFHD – Right Front Head (Right temple)
- 4 RBHD – Right Back Head (Behind and above right ear)
- 5 ARIEL – Top of the head (A)



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Torso

These 4 markers should be in line with the centre of the torso, and be placed on the bony landmarks on the front and back.

6 C7 – 7th Cervical Vertebrae (top of the neck)

7 T10 – 10th Thoracic Vertebrae (Middle of the back)

8 CLAV – Clavicle

9 STRN – Sternum



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Waist

The four main waist markers should be generally in a square or rectangle and placed as far from each other as possible. All waist markers should lie in the same plane which should be parallel to the floor plane in the performer's T-pose.

10 LFWT – Left front waist

11 LBWT – Left back waist

12 RFWT – Right front waist

13 RBWT – Right back waist

14 LMWT – Left mid waist (mid left side of pelvis, or mid front pelvis) – (O)

15 RMWT – Right mid waist (mid right side of pelvis, or mid back pelvis) – (O)

middleWaistMarkersLocation

None – Just LFWT, LBWT, RFWT, RBWT



Sides – LMWT and RMWT are placed mid sides. These can be occluded by swinging arms. Also, using sides can cause swapping with elbow markers, especially with female performers.



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FrontBack – LMWT is Front, RMWT is Back



AutoVST_MakeVST options

Pipeline Operations

- ☒ ReconstructTake
- ☒ AutoVST_MakeVST
- ☒ TposeLabelROM
- ☒ AutoLabelROM
- ☒ CalibrateActor

Parameters

actorName	Colin
sceneUpAxis	Y
boneNamingScheme	MotionBuilder
fingerMarkers	None
middleWaistMarkersLocation	FrontBack
globalPreScaleMethod	None
manualScaleFactor	Sides
labelOrder	FrontBack
markerColorLeft	R: 255 G: 255 B: 0
markerColorMiddle	R: 150 G: 150 B: 0
markerColorRight	R: 0 G: 255 B: 0
stickColorLeft	R: 255 G: 255 B: 0
stickColorMiddle	R: 150 G: 150 B: 0
stickColorRight	R: 0 G: 255 B: 0
boneColor	R: 0 G: 128 B: 0
autoBoneColor	Off
boneColorMult	1.000000

middleWaistMarkersLocation

Specifies if the middle waist markers should go on the front and back, sides, or have none at all.

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Arms

Shoulder, elbow and wrist markers should be placed on the joint axes. The other 2 markers on each arm are auxiliary markers, and can be placed anywhere on the part of the arm they describe.

16 LFSH – Left front shoulder

17 LBSH – Left back shoulder

18 LUPA – Left upper arm – (A) – avoid placing equidistant from shoulder or elbow markers

19 LELB – Left elbow

20 LIEL – Left inner elbow

21 LWRE – Left wrist extra (Forearm) – (A) – avoid placing equidistant from elbow or wrist markers

22 LIWR – Left inner wrist

23 LOWR – Left outer wrist

24 RFSH – Right front shoulder

25 RBSH – Right back shoulder

26 RUPA – (A)– Asymmetric with LUPA

27 RELB – Right elbow

28 RIEL – Right inner elbow

29 RWRE – (A) – Asymmetric with LWRE

30 RIWR – Right inner wrist

31 ROWR – Right outer wrist



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Elbow markers can be placed on the back of the arm slightly above the elbow rather than on the joint centre if you are experiencing problems with occlusion.



RELB – Right elbow
RIEL – Right inner elbow

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Hands

The two non-optional hand markers should be placed on the back of the hand as far apart as possible. Avoid creating a symmetrical quadrilateral with the wrist and hand markers by offsetting one of the hand markers slightly. Try to also create asymmetry between left and right hands.

- 32 LIHAND – Left inner hand
- 33 LOHAND – Left outer hand
- 34 LTHM3 – Left thumb (O) – tip of thumb
- 35 LIDX3 – Left 1st finger (O) – tip of finger
- 36 LPNK3 – Left 4th finger (O) – tip of finger
- 37 RIHAND – Right inner hand
- 38 ROHAND – Right outer hand
- 39 RTHM3 – Right thumb (O) – tip of thumb
- 40 RIDX3 – Right 1st finger (O) – tip of finger
- 41 RPNK3 – Right 4th finger (O) – tip of finger





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AutoVST_MakeVST options

fingerMarkers








None – LIHAND, LOHAND, RIHAND, ROHAND only

Simple3marker – Hand and finger markers.

Use only if you need finger markers to animate from.

Note: the finger markers do not influence bone solving

Pipeline Operations	
<input checked="" type="checkbox"/>	ReconstructTake
<input checked="" type="checkbox"/>	AutoVST_MakeVST
<input checked="" type="checkbox"/>	TposeLabelROM
<input checked="" type="checkbox"/>	AutoLabelROM
<input checked="" type="checkbox"/>	CalibrateActor
<input type="checkbox"/>	
<input type="checkbox"/>	

Parameters	
actorName	Colin
sceneUpAxis	Y
boneNamingScheme	MotionBuilder
fingerMarkers	None
middleWaistMarkersLocation	Simple3marker
globalPreScaleMethod	None
manualScaleFactor	100.000000
labelOrder	ARIEL,LFHD,LBHD,RFHD,...
markerColorLeft	 R: 255 G: 255 B: 0
markerColorMiddle	 R: 150 G: 150 B: 0
markerColorRight	 R: 0 G: 255 B: 0
stickColorLeft	 R: 255 G: 255 B: 0
stickColorMiddle	 R: 150 G: 150 B: 0
stickColorRight	 R: 0 G: 255 B: 0
boneColor	 R: 0 G: 128 B: 0
autoBoneColor	Off
boneColorMult	1.000000
fingerMarkers	
Specifies if a simple set of finger markers should be present.	

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Legs

Knee markers should be placed on the joint axis. The other two markers on each leg are auxiliary markers, and can be placed anywhere on the part of the leg they describe.

42 LHIP – Left hip (upper leg) – (A) – Avoid placing equidistant from knee markers or waist markers

43 LKNE – Left knee (outer knee)

44 LKNI – Left knee inner

45 LSHN – Left Shin (lower leg) – (A) – Avoid placing equidistant from knee markers

46 RHIP – Right hip (upper leg) (A) – Asymmetric with LHIP

47 RKNE – Right knee (outer knee)

48 RKNI – Right knee inner

49 RSHN – Right Shin (lower leg) (A) – Asymmetric with LSHN



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Knee markers can be placed forward on the knee rather than the Joint centre to avoid swapping between inner knee markers and Help if you are experiencing problems with occlusion.



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Feet

The ankle marker should be placed on the ankle bone on the joint axis, the other 4 markers on the foot should be in the same plane, which should be parallel to the floor when the foot is flat.

50 LANK – Left ankle

51 LHEL – Left Heel

52 LMT5 – Left 5th metatarsal (outside of the foot)

53 LMT1 – Left 1st metatarsal (inside of foot)

54 LTOE – Left toe (front of the foot)

55 RANK – Right ankle

56 RHEL – Right Heel

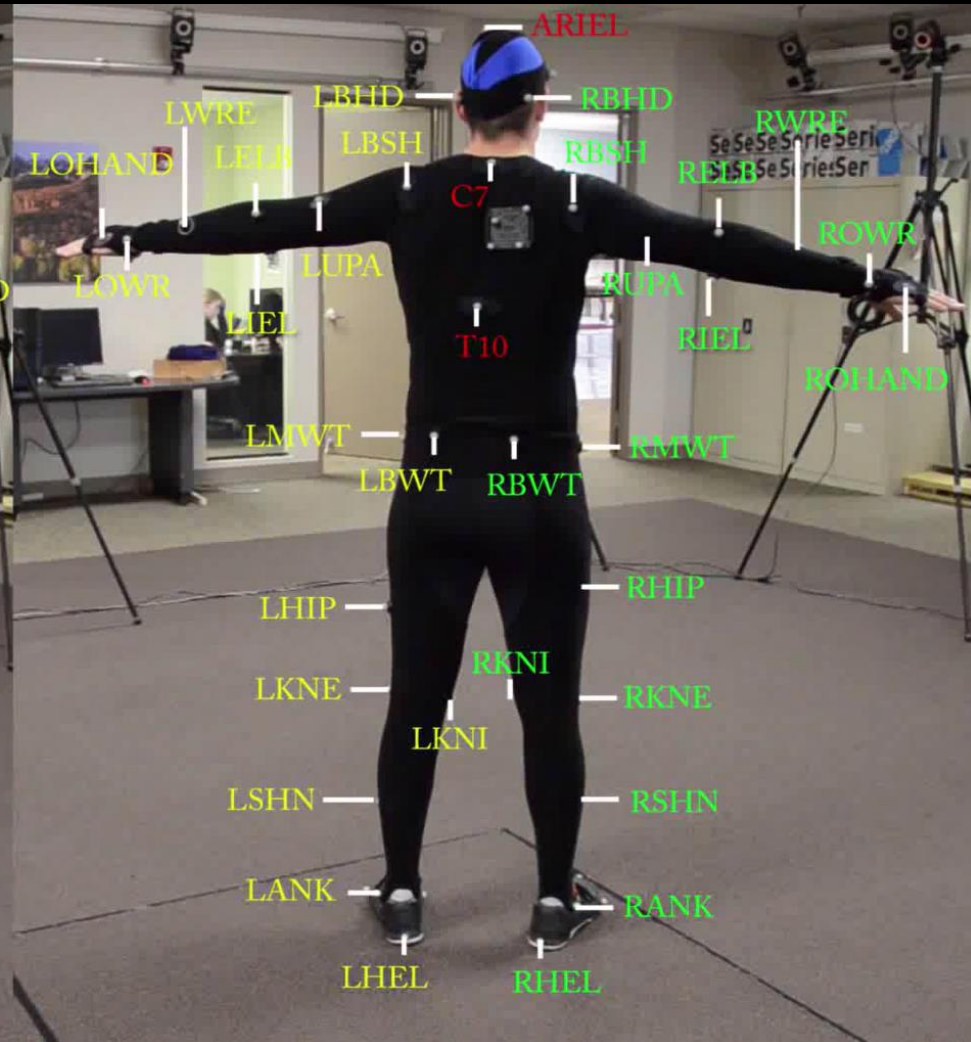
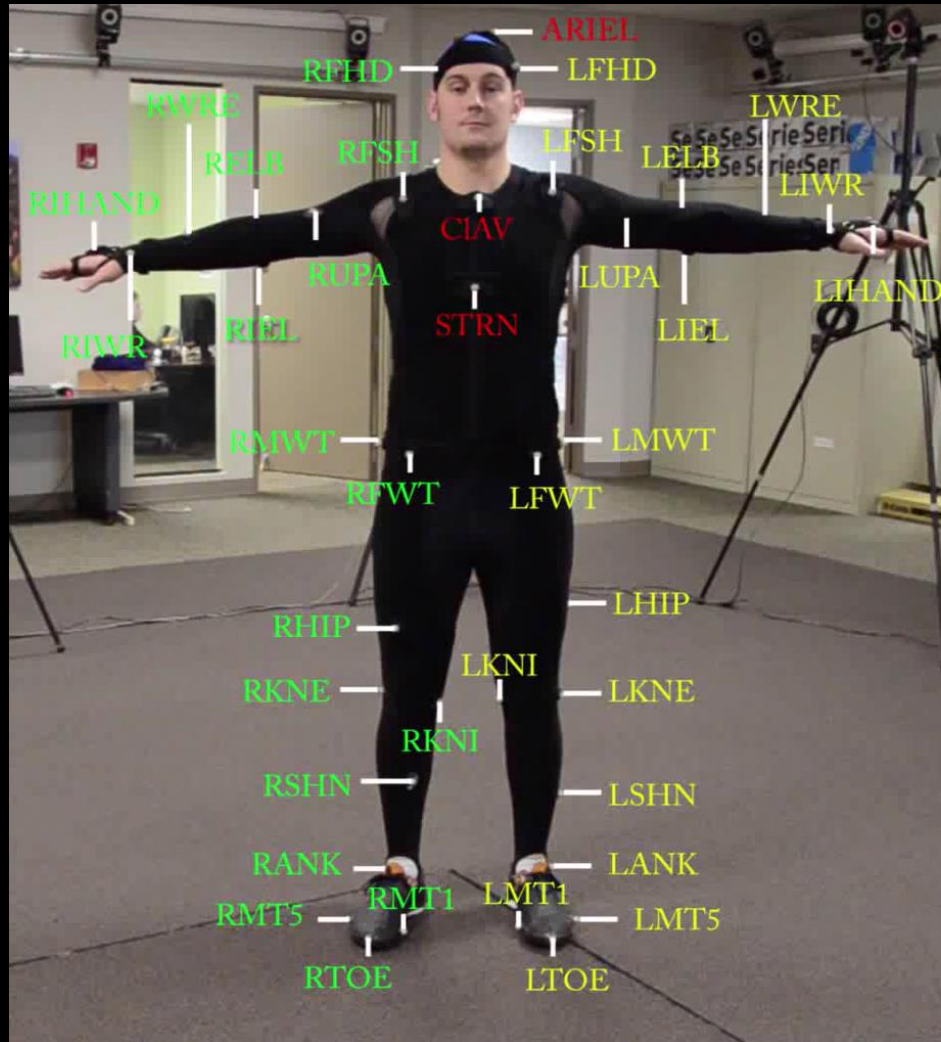
57 RMT5 – Right 5th metatarsal (outside of the foot)

58 RMT1 – Right 1st metatarsal (inside of foot)

59 RTOE – Right toe (front of the foot)



AKTÖR KALİBRASYONU



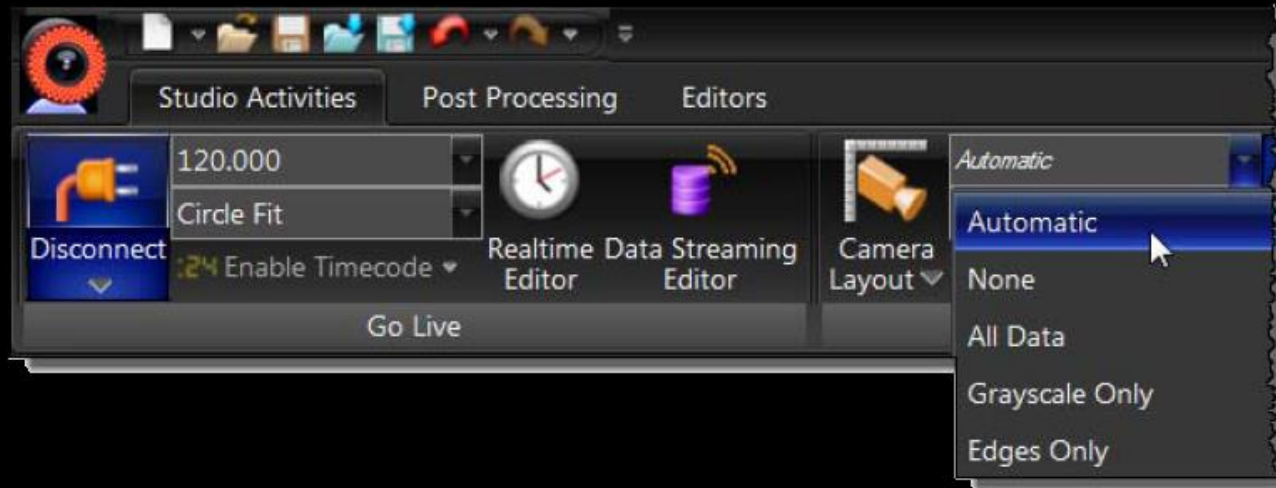
Before you begin capturing data, create a database in which to store your captures.

1. Click the Blade button and on the menu, click **Data Management**.



2. The **Data Management** pane opens at the bottom of the Blade window.
3. Click the **New** button (the first button on the left of the **Data Management** pane), and in the **New Database** dialog box, browse to or enter a location and supply a name and description for the new database, and then click **Create** and **Open**.
4. In the **Data Management** pane, create the structure in which Blade will store your preliminary take:
 - a. Right-click in the window, point to **New** and then click **Project** and supply a suitable name for your project.
 - b. Right-click on the project line you just created, point to **New** and then click **Capture day**.
 - c. Right-click the new **Capture day** node, point to **New** and then click **Session**.
5. You now have an active session, ready to store your preliminary capture.

Before you begin capturing data, ensure that the **Grayscale mode** for the cameras is not set to **All Data**. To quickly check this, look at the **Grayscale mode** list on the Blade ribbon. If any of the cameras is not in the selected mode, the text is italic. To change the **Grayscale mode** setting for all cameras, click on the text and then click the required setting, for example, **Automatic**.



On the **Studio Activities** tab, in the **Capture Takes** group, click **Capture Layout** to display the view panes and editors you will use for capturing takes.





Process the Range of Motion

After you have captured a ROM, the steps for processing it are:

- *Reconstruct a ROM*
- *Detect labeling clusters (if used)*
- *Create the labeling setup template (VST)*
- *Label the ROM*
- *Calibrate the labeling setup*
- *Create the solving setup*

You can then load the character into the live scene.

Create the labeling setup template (VST)

Having reconstructed a ROM and detected any labeling clusters used, you must now repeat each of the following steps for each actor.

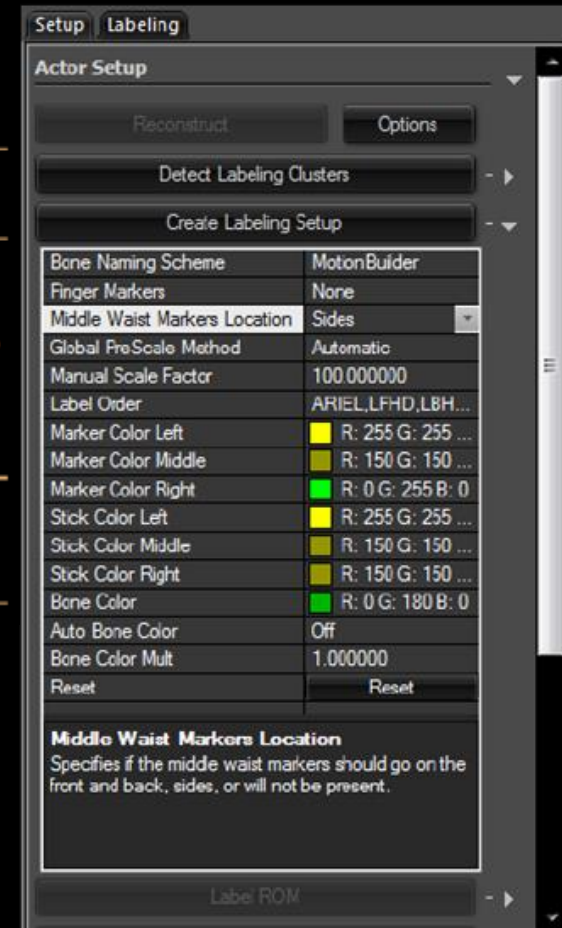
Note

You can also use your real time labeling setup for all your offline labeling.

1. To edit the options for the labeling setup, on the **Setup** tab of the **Labeling** editor, expand the **Create Labeling Setup** section and make any changes necessary.

Tip

Set **Finger Markers** and **Middle Waist Markers Location** to reflect the way in which the markers are placed on the actor.

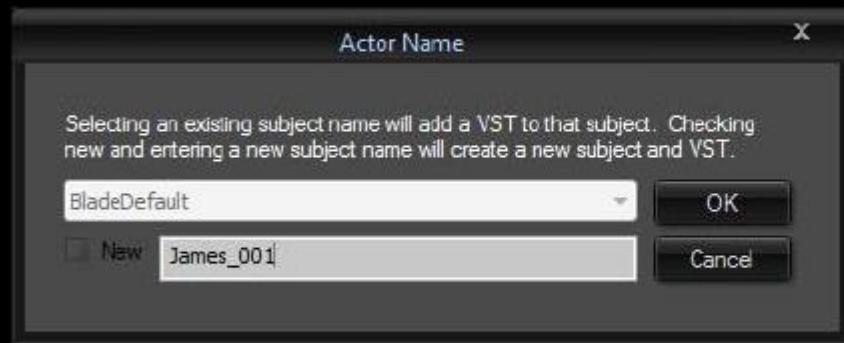


2. To scale the skeleton to the cloud of unlabeled markers selected, ensure **Global PreScale Method** is set to **Automatic**.

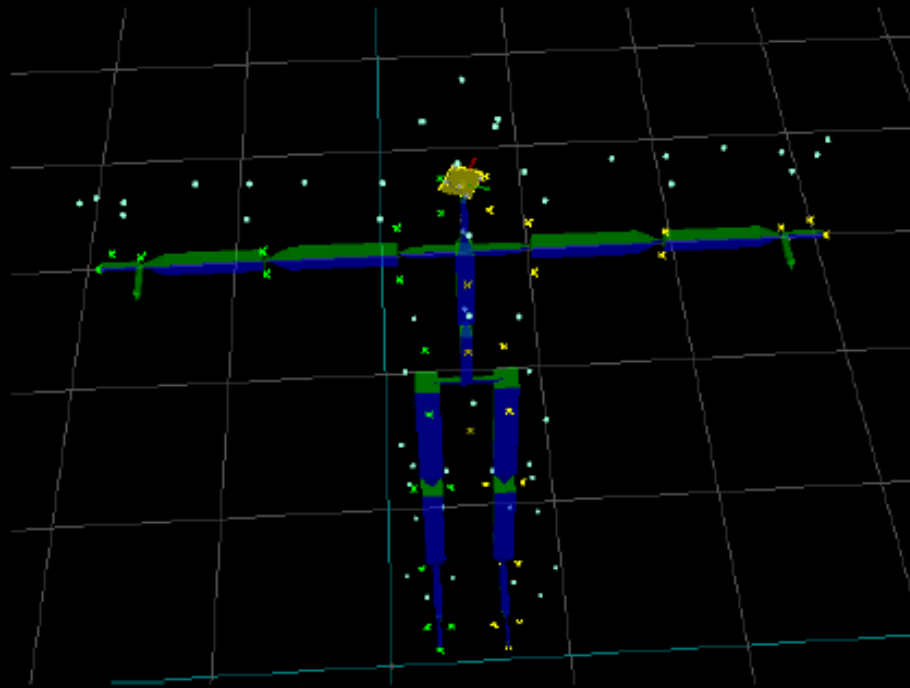
Tip

If necessary, change the color options to distinguish between different characters in the Blade scene.

3. Set the current frame to a good T-pose for the actors, where all of their markers are visible.
4. Select the markers that represent an actor.
5. Click **Create Labeling Setup** and in the **Actor Name** dialog box, select or enter the name of the actor and click **OK**.



The labeling setup is created and the skeleton is positioned in the base pose with the hips in roughly the correct location.



The crosses shown in the illustration are LabelingConstraints; they show the default position of the markers in the labeling setup prior to calibration.

The carton-style bones are LabelingBones.



To remove a marker from a labeling setup, either:

1. Right-click on the **LabelingConstraint** of the unwanted marker, then click **Select Marker**; or

Use the **VPL** or **Selection** editor to select the marker (as it will not normally be visible in the scene)

2. On the **Labeling** tab of the **Labeling** editor, under **Manual Actor Setup Tools**, click the **Remove Marker** button.

The marker and its constraint and parameters are safely removed.

Label the ROM

After you have created the labeling setup template for an actor, you can label the ROM.

1. On the **Setup** tab of the **Labeling** editor, expand the **Label ROM** section and ensure the **AutoLabel** option is selected.

Label ROM	
Standard deviation	50.000000
Separation distance	750.000000
Current Frame Only	<input type="checkbox"/>
AutoLabel	<input checked="" type="checkbox"/>
Reset	Reset
AutoLabel Automatically label all trajectories.	

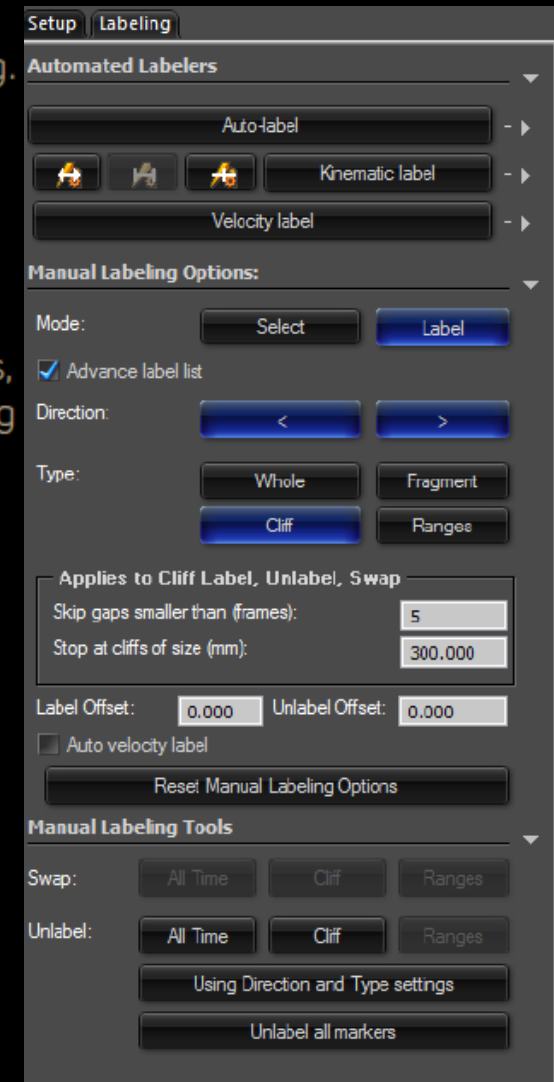
2. Click **Label ROM**.

This uses the base pose and preferred pose of the labeling skeleton, and assumes the pose of the actor and the pose of the bones of the VST is the same. For the default setup, this is a T-pose. This roughly determines the marker positions and automatically labels the entire ROM, if **AutoLabel** is selected as in Step 1.

Tip

Use **Label ROM** for an uncalibrated setup only. If you are importing a VSK file to recalibrate it, use **AutoLabel** instead.

3. If the T-pose label is incorrect, you may need to do some pre-labeling. For example, the finger markers may sometimes be swapped. To remedy this:
 - a. Undo the incorrect T-pose label.
 - b. Manually label the incorrect markers and re-run **Label ROM**.
4. Scrub through the ROM to check for unlabeled markers, mislabels, or swaps. If necessary, you may need to do some manual fine-tuning of the labels.
5. To adjust the labeling, on the **Labeling** tab, modify the required values.



The screenshot shows the 'Labeling' tab of a software interface. It is divided into several sections:

- Setup** and **Labeling** tabs are at the top.
- Automated Labelers** section includes:
 - Auto-label**: A button with a right-pointing arrow.
 - Knematic label**: A button with a right-pointing arrow, preceded by three small icons (a person, a person with a stick, and a person with a stick and a person).
 - Velocity label**: A button with a right-pointing arrow.
- Manual Labeling Options:** section includes:
 - Mode:** Two buttons, 'Select' and 'Label'.
 - ☒ **Advance label list**
 - Direction:** Two buttons, '<' and '>'.
 - Type:** Four buttons: 'Whole', 'Fragment', 'Cliff', and 'Ranges'.
 - Applies to Cliff Label, Unlabel, Swap** section:
 - Skip gaps smaller than (frames):** A text box with the value '5'.
 - Stop at cliffs of size (mm):** A text box with the value '300,000'.
 - Label Offset:** A text box with the value '0,000'.
 - Unlabel Offset:** A text box with the value '0,000'.
 - ☐ **Auto velocity label**
 - Reset Manual Labeling Options**: A button.
- Manual Labeling Tools** section includes:
 - Swap:** Three buttons: 'All Time', 'Cliff', and 'Ranges'.
 - Unlabel:** Three buttons: 'All Time', 'Cliff', and 'Ranges'.
 - Using Direction and Type settings**: A button.
 - Unlabel all markers**: A button.

Calibrate the labeling setup

After you have created the labeling setup template for an actor and labeled the ROM, the next step is to calibrate the labeling setup.

1. On the **Setup** tab of the **Labeling** editor, expand the **Calibrate** section.

You are recommended to use the default options.

Calibrate	
Mode	Full
Stats Mode	Merge TemplatesAn...
Rest Importance	0.100000
Marker Importance	0.100000
Bone Importance	0.100000
Quality	Normal
Active Frames	250
LC Min Marker Deviation	0.500000
LC Motion Coherence Threshold	600.000000
Overwrite template ranges	<input type="checkbox"/>
Save VSK after calibration	<input checked="" type="checkbox"/>
Reset	Reset
LC Motion Coherence Threshold Specifies how similar the motion of a LabelingCluster must be to a LabelingBone in the actor for it to be associated.	

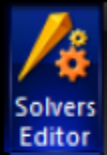
Important

The calibration of the labeling setup is very important. It optimizes all the parameters in the Labeling Setup Template, from which the unique setup for each actor is defined (bone lengths, default marker constraint offsets).

2. Click **Calibrate**.

To create a solving setup:

1. Launch the **Solvers** editor from any of the ribbons:

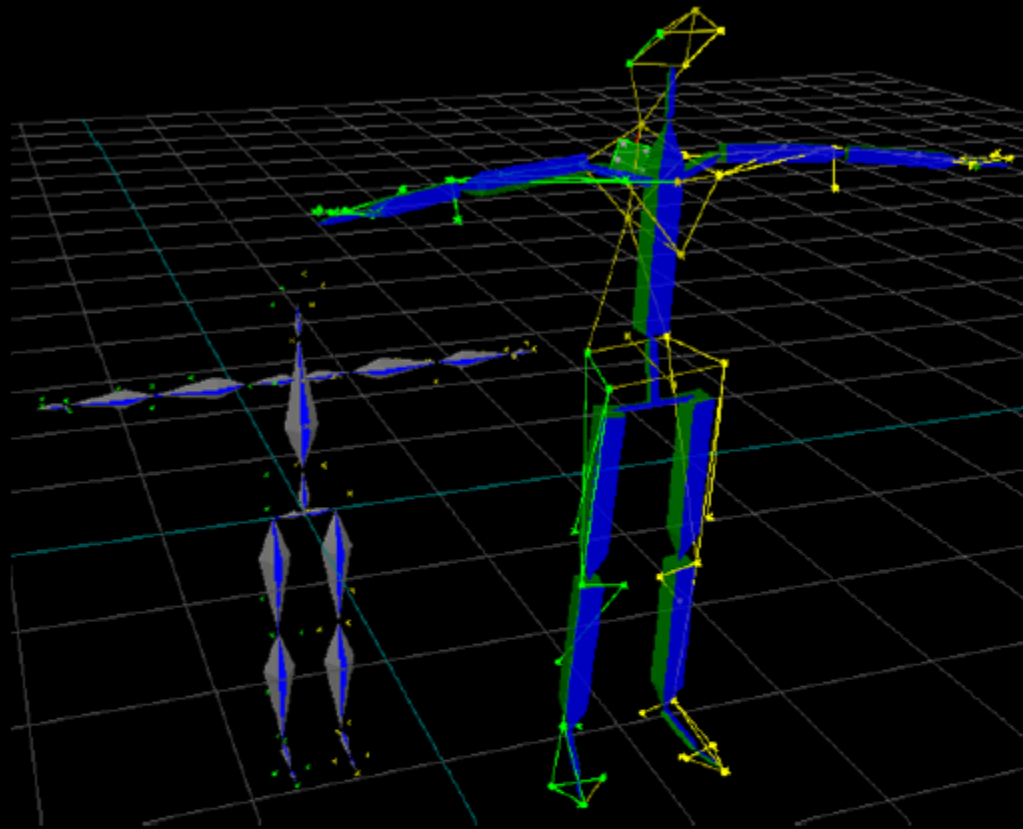


2. In the **Solvers** editor, make the appropriate selections:
 - a. In the **Solving Setup** list, click the character for which to create a solving setup.
 - b. At the top of the **Actor Setup** section, in the **Setup type** area, select the operation to automatically create a solving setup.

The default settings for creating a solving setup are:

Copy from Labeling Setup

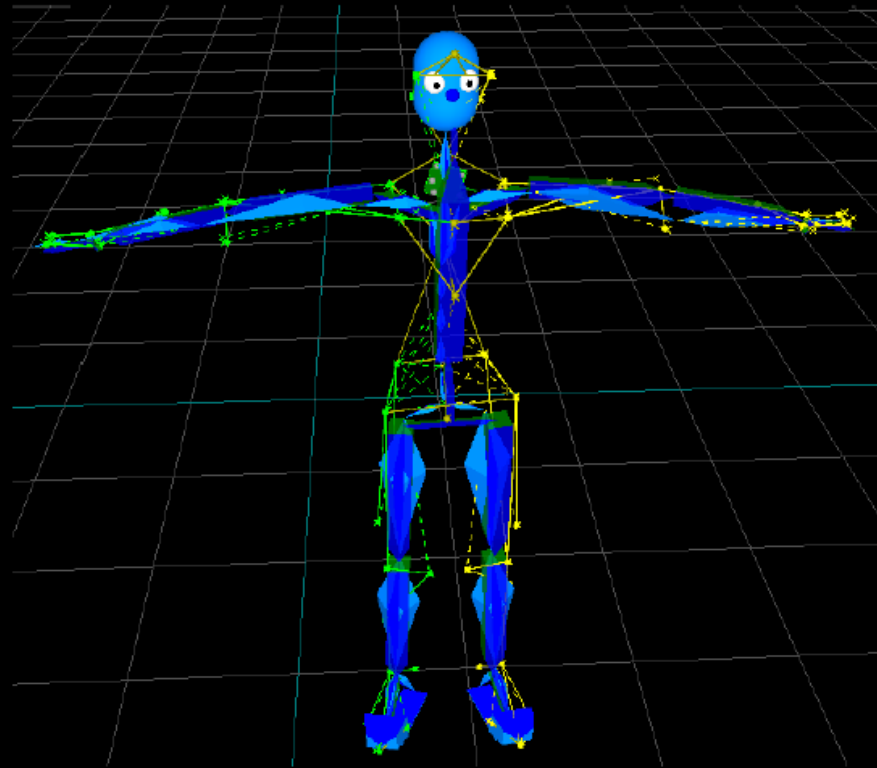
This creates a Solving Setup with identical bones and constraints to the current Labeling Setup. This operation can be run with any labeled frame; it does not rely on a T-pose to pose the skeleton.



Production

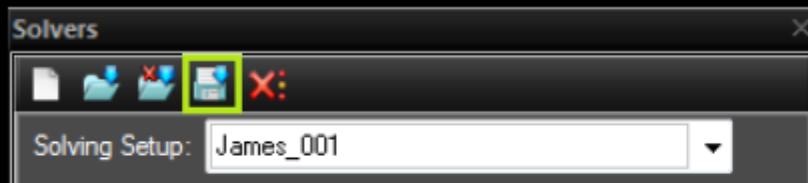
This creates a more complex skeleton, notably in the spine and neck. You can also create roll bones. Also, multiple constraints with varying weight are set up for some markers.

This operation needs a T-pose to be in the current frame so that bones can be initially scaled and posed.



SolvingBones by default have the tetra-stripe style to distinguish them from LabelingBones. The **Copy from Labeling Setup** has just been created with hips at the origin. The **Production Setup** has been posed in the first frame (or solved for the take if **Solve Motion** was selected in the **Create Solving Setup** options).

3. To export the solving setup as a VSS file, in the **Solvers** editor, click the **Save As** button and enter an appropriate name.



You can now use the solving setup in real time and post processing. However, to achieve the desired solving behavior, you will probably need to manipulate the solving skeleton.