ShowMorphoDynamics

The sample model “VirtualHuman_forWalkingUnderLimb.isml” is prepared to exemplify the function of “Show Morphology Data” and “Show Morpho-Dynamics” in a context menu appeared by pressing a right mouse button on a module. Please follow the step below.

1. Open Model File
   1) Select [File] - [Open ISML Model], then Open Model File dialog starts. (Fig. 1.1)
   2) Select a model file whose name is “VirtualHuman_forWalkingUnderLimn.isml” in the directory “insilicoIDE/sample/ShowMorphoDynamics/”. (Fig. 1.2)
   3) Click [OK] button on the Open Model File dialog, then the dialog closes and one module named VirtualHuman appears on the insilico canvas. (Fig. 1.3)

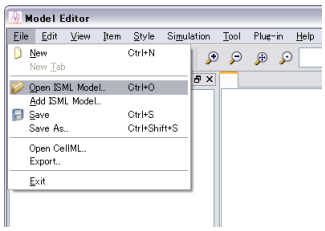


Fig. 1.1 Open Model File Dialog

Fig. 1.2 Select ISML file

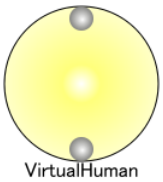


Fig. 1.3 VirtualHuman model on ISIDE

2. Select Context Menu: “Show Morphology Data”
   1) Press a right mouse button on the module “VirtualHuman”, and select a menu [Show Morphology Data] in the context menu. (Fig. 2.1.1) Then, a new window pops up. (Fig. 2.1.2)

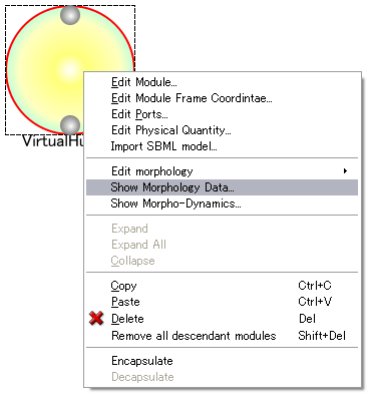


Fig. 2.1.1 Press a right mouse button on a module, and select a menu.

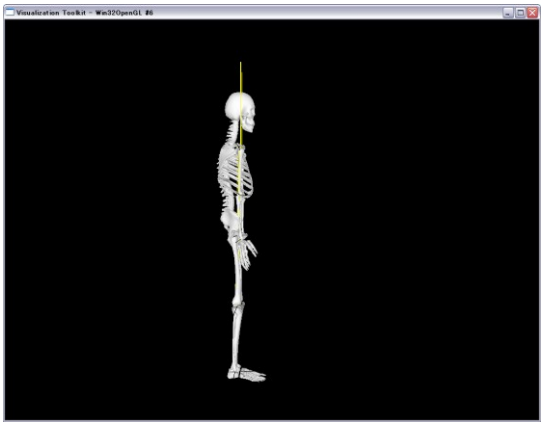


Fig. 2.1.2 Morphology Data Window

2) Press a left mouse button on the window, then the morphology data starts turning. (Fig. 2.2)

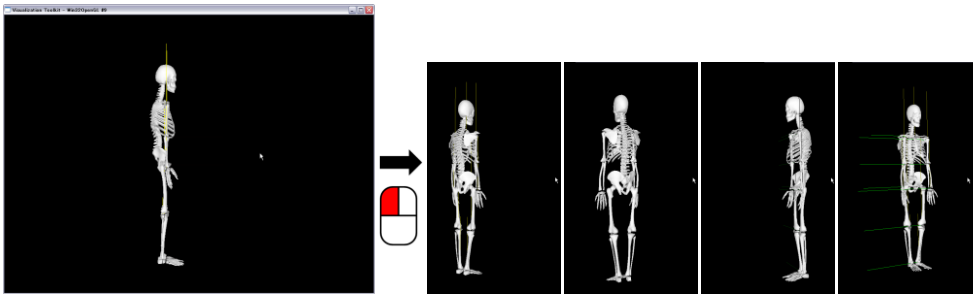


Fig. 2.2 Press a left mouse button on the window.

3) Press a right mouse button on the window, then the view starts zoom in or zoom out. (Fig. 2.3) Zoom in or Zoom out is depending on the position of the mouse.

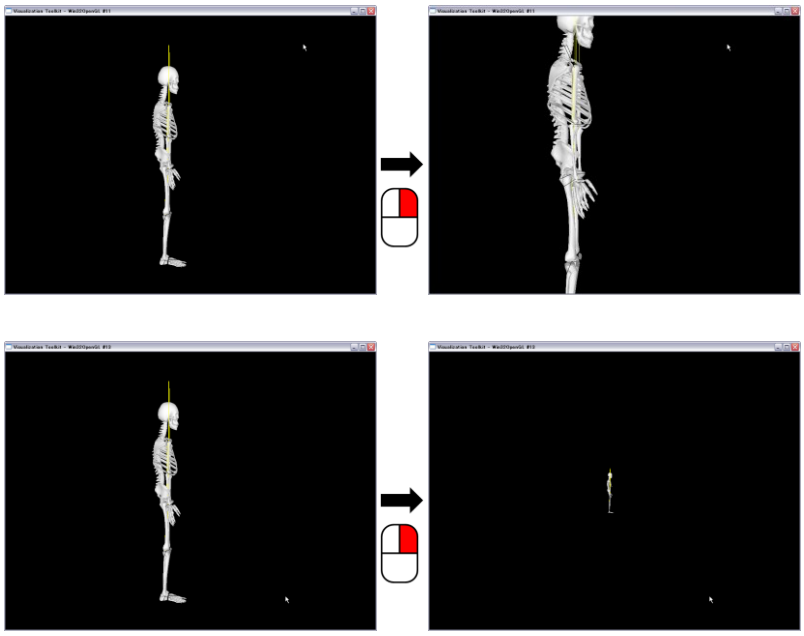


Fig. 2.2 Press a right mouse button on the window.

4) Click [x] button, then the window closes. (Fig. 2.4)

Fig. 2.4 Close window

3. Select Context Menu: “Show Morpho-Dynamics”

1) Press a right mouse button on the module “VirtualHuman”, and select a menu [Show Morpho Dynamics] in the context menu. (Fig. 3.1.1) Then, a new window pops up and morphology data starts to move. (Fig. 3.1.2)

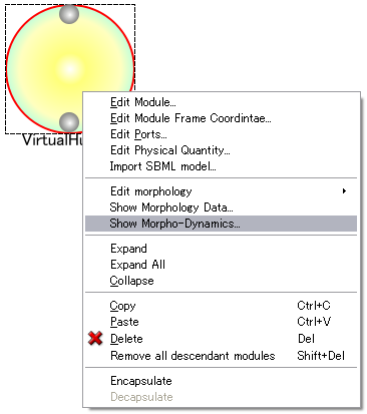


Fig. 3.1.1 Press a right mouse button on a module, and select a menu.

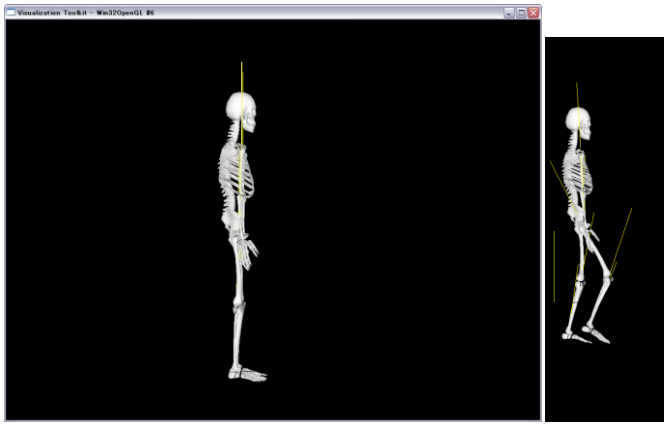


Fig. 3.1.2 MorphoDynamics Window

2) Clock [x] button, then the window closes. (Fig. 3.2)

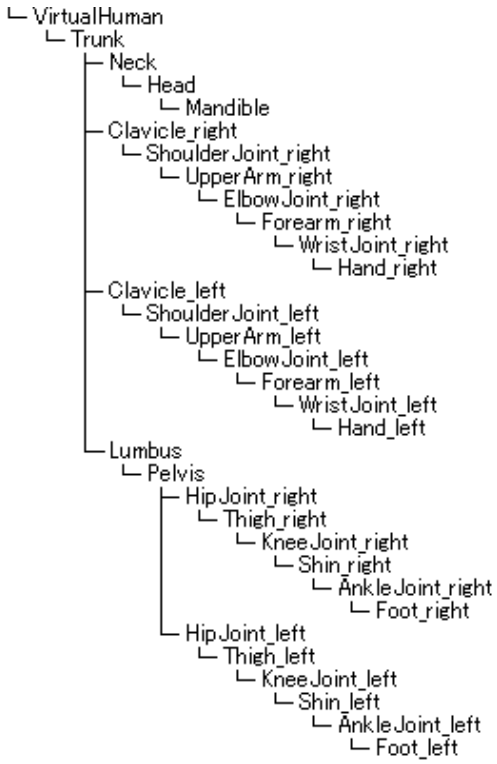
Fig. 3.2 Close window

Model

This model consists of following modules.

VirtualHuman / Trunk / Neck / Head / Mandible / Clavicle_left / Clavicle_right / ShoulderJoint_left / ShoulderJoint_right / UpperArm_left / UpperArm_right / ElbowJoint_left / ElbowJoint_right / Forearm_left / Forearm_right / WristJoint_left / WristJoint_right / Hand_left / Hand_right / Lumbus / Pelvis / HipJoint_left / HipJoint_right / Thigh_left / Thigh_right / KneeJoint_left / KneeJoint_right / Shin_left / Shin_right / AnkleJoint_left / AnkleJoint_right / Foot_left / Foot_right

These modules have following structural relationship. (Tree View)



Each module has a frame, and information about position and posture of the frame. Relationships of the frames are depending on structural relationship among modules. For example, position of the frame of Forearm indicates position of the origin of the frame of Forearm in frame coordinate of ElbowJoint, and position of the frame of ElbowJoint indicates position of the origin of the frame of ElbowJoint in frame coordinate of UpperArm. This recursive relationship is applied to posture of frame, too. This information is not changed even if position or posture of belonging frame is changed, i.e. when posture of only ElbowJoint changed for UpperArm, posture of Forearm for ElbowJoint does not change (posture of Forearm for UpperArm changes).

By using morphology data and time-series data which are associated to modules, ISIDE can show the morphology data and morpho-dynamics as you tried above. Morphology data and time-series data are external files. On this sample file, following external data are used.

morphology data(These external files are in the directory “MorphologyModels”):

SkeletonModel_Sternum.wrl	->	Trunk
SkeletonModel_Cervicalspine.wrl	->	Neck
SkeletonModel_Skull.wrl	->	Head
SkeletonModel_Mandible.wrl	->	Mandible
SkeletonModel_ClavicleL.wrl	->	Clavicle_left
SkeletonModel_ClavicleR.wrl	->	Clavicle_right
SkeletonModel_HumerusL.wrl	->	UpperArm_left
SkeletonModel_HumerusR.wrl	->	UpperArm_right
SkeletonModel_ForearmL.wrl	->	Forearm_left
SkeletonModel_ForearmR.wrl	->	Forearm_right
SkeletonModel_HandL.wrl	->	Hand_left
SkeletonModel_HandR.wrl	->	Hand_right
SkeletonModel_Lumbus.wrl	->	Lumbus
SkeletonModel_Pelvis.wrl	->	Pelvis
SkeletonModel_ThighL.wrl	->	Thigh_left
SkeletonModel_ThighR.wrl	->	Thigh_right
SkeletonModel_ShinL.wrl	->	Shin_left
SkeletonModel_ShinR.wrl	->	Shin_right
SkeletonModel_FootL.wrl	->	Foot_left
SkeletonModel_FootR.wrl	->	Foot_right

time-series data:

tsData_lowerLimb.tsml

-> Trunk / HipJoint_left / HipJoint_right / KneeJoint_left / KneeJoint_right / AnkleJoint_left / AnkleJoint_right

This model is not characterized by equation etc. So, this model is not for simulation by any means (ISSim, FreeFEM, C++) but only for visualization of the morphology data and time-series data.