



# How to use Simulink 3D Animation? Basic Lecture



FL13-19-2  
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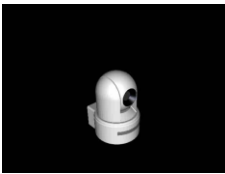
## Outline

- What is the “Simulink 3D Animation”?
- How to make or change a model?
- How to load a model into Simulink?
- How to move a model as you want?
- How to create viewpoint?
- How to record animation in the actual time not in the simulation time?
- How to move viewpoints during simulation?



## What is the “Simulink 3D Animation” ?

PTZ Camera motion



Quadcopter's motion



Powerful tool to visualize dynamic system behavior.



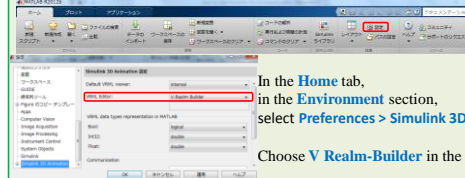
## How to make or change a model ?

By using **V Realm-Builder 2.0** !!  
(SolidWorks is also a powerful tool, but it is difficult to master.)

### 1. V Realm-Builder 2.0's installation procedure.

Input “vrinstall –install editor” to  
MATLAB command window.

### 2. Necessary setup to use V Realm-Builder in MATLAB.



In the **Home** tab,  
in the **Environment** section,  
select **Preferences > Simulink 3D Animation**.

Choose **V Realm-Builder** in the **VRML Editor**.

Now, you can use **V Realm-Builder 2.0** in **MATLAB**.



## How to make and load a model ?

**1. Start V Realm-Builder**  
Click “New”.

**3. Load VRML file**  
Browse or input file name.

**2. Make a simple model**  
Demonstration

**4. Click VR Sink block**  
Demonstration

VR SINK can load VRML file, which file extension is “.WRL” or “.wrl”.

You can also copy and use VRML file in the following folder.  
[http://Fourier.fl.ctrl.titech.ac.jp/~DY/Simulink 3D Animation.](http://Fourier.fl.ctrl.titech.ac.jp/~DY/Simulink%203D%20Animation/)



## How to move a model as you want ?

**1. Start V Realm-Builder**  
Click “Edit”.

**3. Reload VRML file**

Checkboxes appear at left side of children nodes whose parent nodes have name.  
Check checkboxes of nodes which you want to input signal.  
**Input ports appear !**

**2. Give a name to parent node**

Long left-click on parent's node name.  
Change names.  
Save this file.


### How to move a model as you want ?

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**1. Transform input signal's axes**  
(If necessary.)  
Axes introduced in VRML file is defined as follow.  
**+x points right**  
**+y points up**  
**+z points out of the screen**

**3. Input position vector**  
If vector's dimension is 3, input directly.  
If its dimension is under 2, use "VR Signal Expander".  
**Object moves as you input !!**

**2. Input rotation matrix**  
You must use "Rotation Matrix to VRML Rotation" block.



**Problems.**  
**How to create viewpoint at appropriate position?**  
**How to record animation in the actual time not in the simulation time?**

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### How to create viewpoint ? (By Simulink viewer)

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**1. Choose speed of navigation**  
Select **Navigation > Speed**  
I recommend you to choose "Very Slow".

**3. Create viewpoint**  
Select **Viewpoints > Create Viewpoint...**

**2. Choose method of navigation**  
There are 3 methods.  
**Walk, Examine and Fly.**  
For details, see the next slide.  
(Demonstration)

**4. Save VRML file**  
**You must save VRML file before you close viewer.**  
Select **File > Save As...**

Now, you can choose Viewpoints from left upper tab!!



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### How to create viewpoint ? (By Simulink viewer)

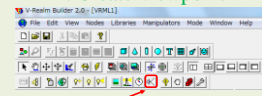
Explanation of 3 types of Navigation

<http://www.mathworks.co.jp/help/s3d/navigate-in-the-simulink-3d-animation-viewer.html#bt1in3m>

### How to create viewpoint ? (By V Realm-Builder)

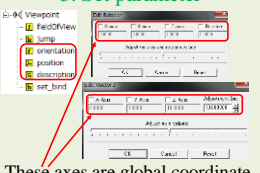
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**1. Create viewpoint**



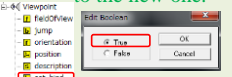
Click this.  
Then, new node appears.

**3. Set parameter**



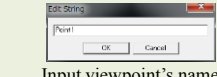
These axes are global coordinate. See P7 1.

**2. Bind current viewpoint to the new one.**



Choose "True".

**Input viewpoint's name (Demonstration)**

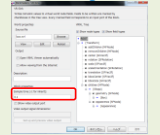


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### How to record animation in the actual time. 1

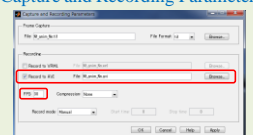
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**1. Decide timing of recorded**  
Set up "Sample time".



Do not enter -1 as Sample time.  
**This parameter controls how often the simulation is recorded to a file.**  
Nothing to do with movie's FPS(frame per second).

**2. Decide movie's FPS**  
In the viewer, Select **Recording, Capture and Recording Parameter.**



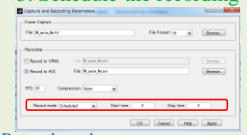
Check "Record to AVI".  
**Enter FPS which is compatible with Sample time.**  
For example, when you set sample time in the VR Sink 0.04, appropriate FPS is 25.

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### How to record animation in the actual time. 2

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**3. Schedule the recording**



**Record mode**  
Scheduled →  
Input **Start time** and **Stop time.**  
(In simulation time.)  
Manual →  
You can start and stop recording by clicking below button in the viewer.

**4. Select a compression method**  
(If necessary)  
.AVI files can become large, so you might need to compress the .avi files.  
If you want to get more information, please read MATLAB help.

**Movie is saved in the current folder.**  
In the default setting, movie is saved as "%f\_anim\_%.n.avi". (For example, VRML file name is "quad\_4.wrl", then the .avi file name is "quad\_4\_anim\_1.avi". (for the second time, "quad\_4\_anim\_2.avi")

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