# Altair HyperWorks Desktop 2019 Tutorials

HWD-0020: Animation Synchronization

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In this tutorial you will learn how to:

- Synchronize windows with different data types

## Tools

To access the **Synchronize Window Animation** dialog:

- From the **Tools** menu, select *Synchronize Animation*.

- From the **Animation Controls** panel, click *Time Scales*.

This dialog allows you to synchronize the animation, plot, and video windows on a page by applying appropriate scaling and offset values. This tool is useful for synchronizing windows that contain animation results in different units and/or begin at different time steps.
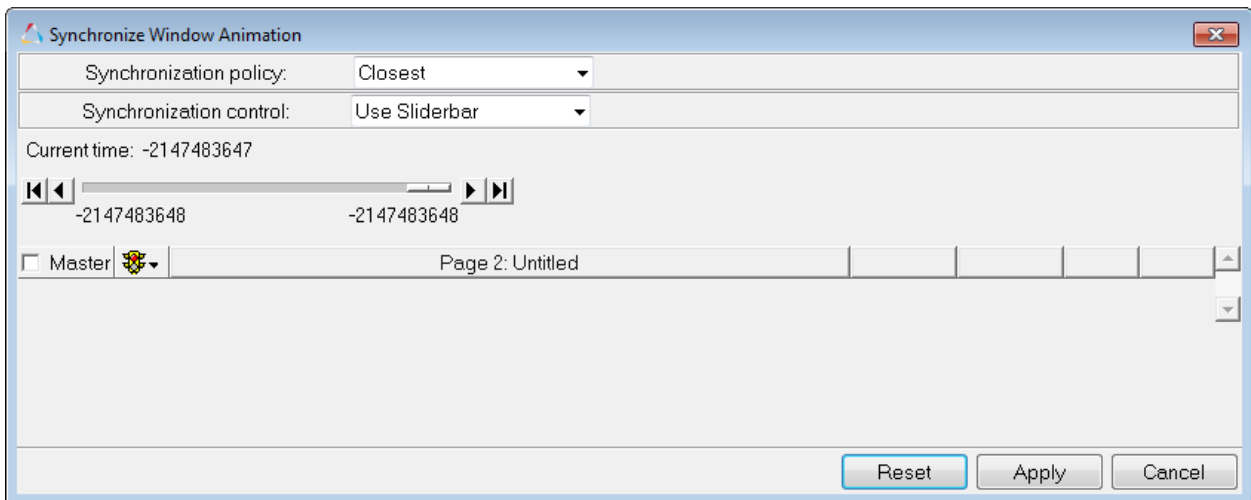


The dialog contains a **Scaling** and **Offset** field for each window on a page. The **Scaling** field multiplies the total run time of the window's animation by the specified amount. The animation is then scaled to run within the new time boundaries. The **Offset** field delays the start of a window's animation for the specified duration.

## Exercise: Synchronize Various Data Types

### Step 1: Load animation data from the MADYMO file `driv_bag.kin3`.

1. From the menu bar, select *File > New > Session* to clear the contents of the HyperView session.

2. From the **Select application** menu, 🟥, select *HyperView*.

3. From the **Load Model** panel, load the file `driv_bag.kn3`, located in the `../tutorials/mv_hv_hg/animation/animation_synchronization` folder for both **Load model** and **Load results**.

4. Click *Apply* to load the animation data.

5. Click ⬚ the **Standard Views** toolbar to view the left side of the model.

6. Click ⬚ from the **Standard Views** toolbar to view the right side of the model.

## Step 2: Setup a three-window page layout and open the AVI file `iihs2.avi` in window 3.

1. From the **Page Window Layout** dialog, select the three-window layout, ⬚.

2. Activate window 3 (lower left window).

3. From the **Select application** menu, select *MediaView*, ⬚.

4. From the menu bar, select *File > Open > Media*.

5. Select **Files of type:** *Windows AVI files (*.avi)*.

6. Open the file `iihs2.avi` from the `animation_synchronization` folder.

## Step 3: Plot xy data curves from the MADYMO file `linnacc` in window 2.

Using the **Build Plots** panel, in a single plot window, plot time versus linear acceleration for the lower torso, upper torso, and head resultant acceleration.

1. Activate window 2 (the window on the right).

2. From the **Select application** menu, select *HyperGraph 2D*, ⬚.

3. Select the *Build Plots* panel ⬚ .

4. From the file browser button ⬚ , open the file `linacc` from the `animation_synchronization` folder.

5. For **X type:**, select *Time*.

6. For **Y type:**, select *Linear Acceleration*.

7. For **Y Request:**, select *LOWER TORSO*, *UPPER TORSO*, and *HEAD*.

   Press the CTRL key while selecting components to select more than one.

8. For **Y Component:**, select *Res. acceleration*.

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9. Click *Apply* to create the xy data curves.
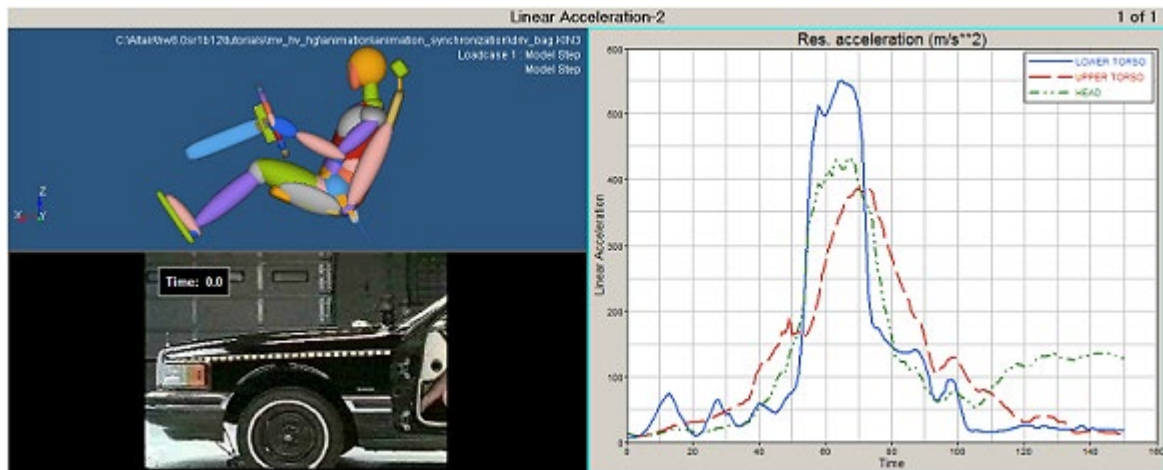


Result of loading the various data files

## Step 4:   Synchronize the animation, xy plot, and video data.

Synchronize the animation of all three windows using the **Synchronize Window Animation** dialog.

1. Click ▶ to animate the page's windows.

   Notice that the animation, plot, and video windows are not synchronized.

2. Click ⏸ to stop/pause the animation.

3. Activate window 1 (the animation window).

4. Select the *Animation Controls* icon, ⚙, and then select **Time Scales...**.

5. Move the **Current time** slider to *0.018*.

   Note that the airbag begins to open in the HyperView window.

6. Click the lock button 🔒 under **Time A** for Window 1 and Window 2 in the dialog box to set the start time for the plot and model.

7. Move the time slider to *0.138*.

   Note that the head has bounced off the airbag.

8. Click the lock button 🔒 under **Time B** for Window 1 and Window 2 in the dialog box to set the end time for the plot and model.

9. Move the slider bar to *17*.

   Note that the air bag begins to open in the video window.

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10. Click the lock button 🔒 under **Time A** for Window 3 in the dialog box to set the start time for the video.

11. Move the **Current time** slider to *47*.

    Note that the head has bounced off the airbag for the first time in the video.

12. Click the lock button 🔒 under **Time B** for Window 3 in the dialog box to set the end time for the video.
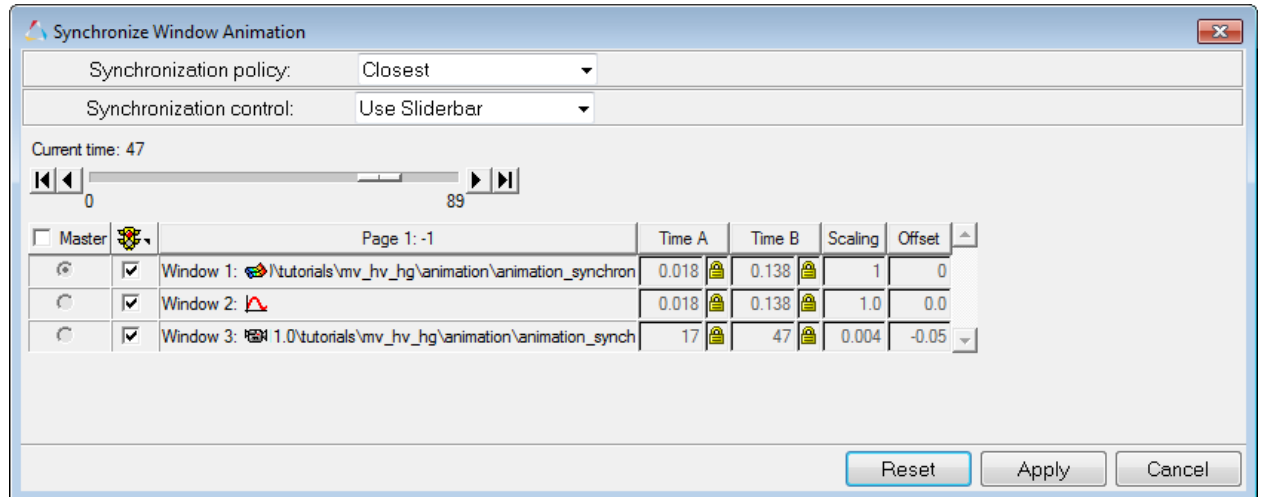


13. Click **Apply**.

14. Animate page 1 and observe that the events are now synchronized.