

# Animation in Pro/ENGINEER Wildfire 2.0

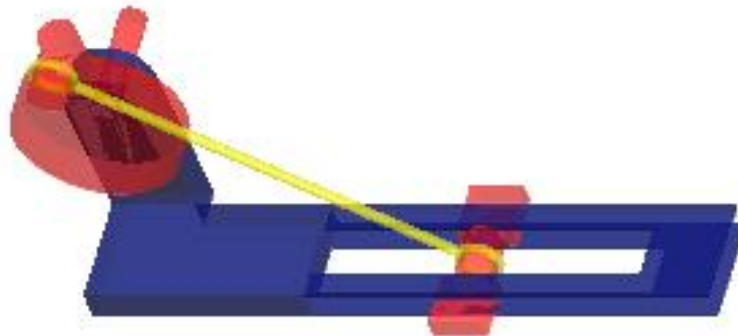
January 19, 2005

## 1 Background

**Pro/E Animation** is used to visualize the motion of a mechanism or a mechanical assembly in operation. **Pro/E Animation** is carried out by: (i) coordinating the components of an animation sequence, and (ii) playing back the animation.

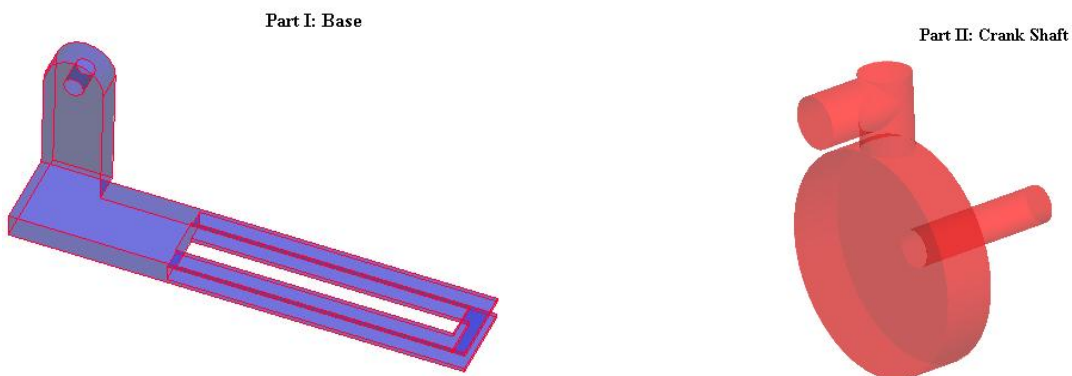
Different from ordinary Kinematics Motion function of Pro/E, the Design Animation function in the **Animation** module of Pro/E Wildfire 2.0 is more about showing the motion of a concept mechanism design. The motion can be illustrated by dragging the moving components, or by interpolating a number of positions of the mechanism. It may not honor all of the constraints defined in the design. One can carry out Animation before the detailed assembly is completed.

This tutorial demonstrates Pro/E Motion Design by creating the motion sequence of a simple four-bar linkage mechanism, as shown in the following figure.



## 2 Creating Assembly

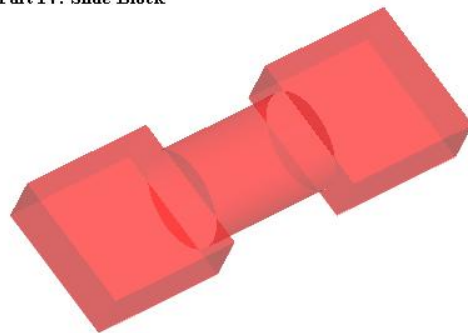
The mechanism to be animated consists of four components as shown in the following.



Part III: Link







Part IV: Slide Block



These components are modeled and their models are assembled in Pro/E. The assembly process could be a challenge. Uncheck the “Allow Assumption” in the Component Placement window tends to be helpful.

### 3 Creating the Motion Sequence

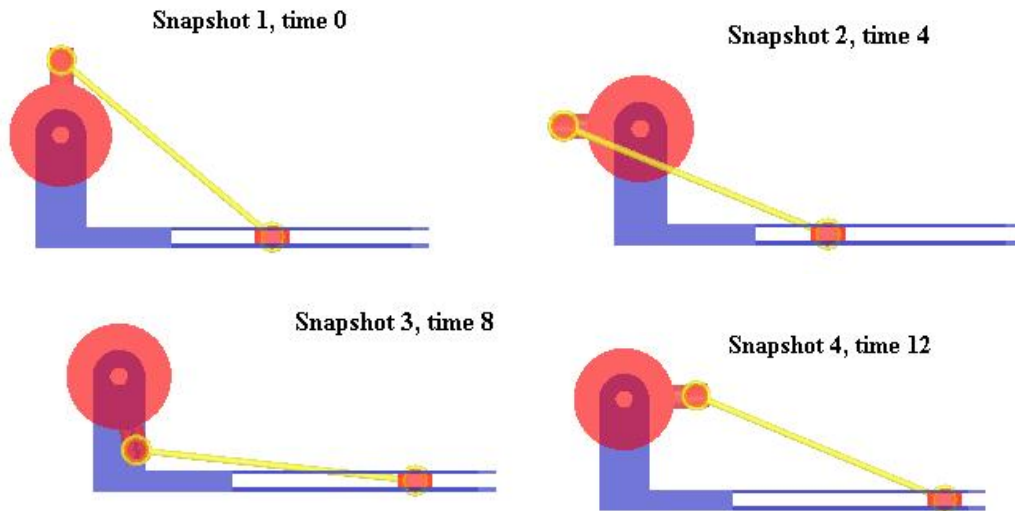
Following steps are needed to create an animation:

- 1) Create/open/bring up the assembly model.
- 2) Enter the Animation mode by clicking **Applications → Animation**.
- 3) The Animation toolbar (as left) and timeline appear on screen. You need to first get familiar with the meaning of the icons on the animation toolbar. An **Animation** menu is added to the Pro/ENGINEER menu bar. You can create your animation either by selecting commands from the **Animation** menu or by clicking the toolbar buttons.
- 4) You may practice on dragging one element of the mechanism to set the assembly moving. This can be done by clicking the “Drag model and create snap shot”  icon on the animation toolbar. In the Drag window, click on the “Drag model and create snap shot”  icon in the Drag window again, then selecting an object (left click on) and drag the part to move. Before the last step, you may also click the “snap shot”  icon in the Drag window first to record the new position after the dragged motion as a snap shot. This snap shot can be used later as a key frame of the animation.
- 5) Create a new animation by clicking **Animation → Animation** or click  on the Animation toolbar. The **Animation** dialog box opens with a default name for the animation. You may use the **Rename** command to reassign the name.
- 6) Check the body definition by selecting **One Part per Body**. This selection may empty the ground body of parts. You should edit the body named ground and reassign the base component as ground part.
- 7) Take a series of snapshots of the assembly at specific positions by using the drag function to move the moving bodies to several new positions. Animation will interpolate between these key frames to produce a smooth animation. The series of repeated steps are:



### Animation → Snapshot → Take Snapshot → Drag




For this example, drag the crank to four positions, i.e.  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ ,  $270^\circ$  in the snapshot mode.



- 8) Define the animation motion sequence of a component (driver) to create the movement, such as **Key Frame Sequences**.

Click **Animation → Key Frame Sequence**; give a proper name, and make sure the reference is Ground. In the Key Frame box, sequentially select each of the snapshots and assigning corresponding time. For interpolation box, choose linear or smooth as you like. Then, Click ok and exit.

## 4 Playing the Motion

- 1) Start your animation by clicking **Application → Animation → Start the animation** or click on the  icon on the animation toolbar.
- 2) The **Run** dialog box opens. The model moves as specified by the animation components.
- 3) If you want to view the animation again, or to change the speed or direction, click **Animation → Playback** or click on the  icon on the animation toolbar.
- 4) Define views along your animation to view orientations and magnification of your model. You can also choose an interpolation method for your views.
- 5) Rerun the animation and view results.
- 6) Save your animation and results. You save your results by clicking  on the **Playbacks** dialog box. Animation saves your playback results to a .pba file. You can also export to a .fra file. Save your animation using the **File → Save** command. Animation saves your animation to the .asm file with your model.