

# Lab 7

## IAT 343 Spring 2012

# Due Dates

## **(3/04) Team:**

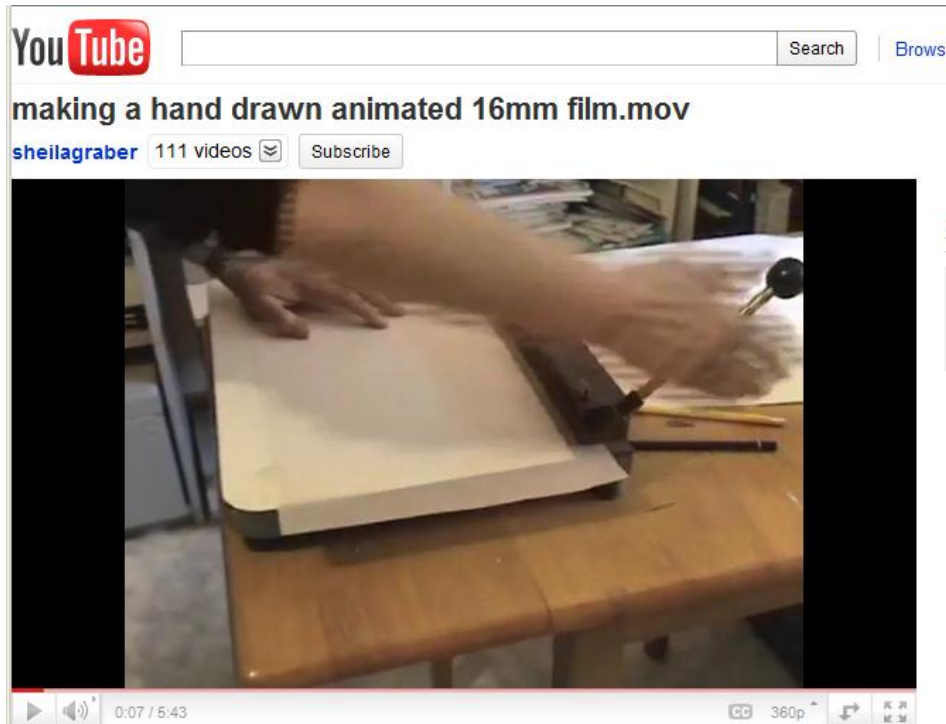
- Three second animation drawing (i.e., cell-animation)
- Submit both digital format (avi or mov) and flip book

## **(3/11)**

- **Team:** Animatic (animated storyboard/pre-viz with sound)

# 3 second animation drawing (flipbook)

- Three second 2D animation drawing- wk 6 (2%) Following the tradition of classical animation, the team will draw three second animation (24 framers per second) which shows the most memorable scene in your team script.
- Number of images for 3 seconds:  $24f/2 \times 3 = \text{minimum } 36 \text{ frames/drawings}$ 
  - Regarding each drawing being shot for two frames: 'twos'.
- Either hand-drawn pencil-sketch on paper or 2D application through inout device (mouse, digital pen etc.)
- Could separate foreground character from background elements in layers (e.g., use of Adobe Photoshop or Premiere)
- Make into a video sequence (avi or mov) and upload to your team site.
  - if hand-drawn sketch, just use camcorder to record page flipping (flip book).
  - if digitized, use a video editing application (Adobe Premiere, MS Movie Maker etc.)
- Submit your drawings during the lab next week or at the beginning of the lecture (6/28)
- References:
  1. Flip book: "Center" with music<http://youtu.be/WQGDO4hs76g>
  2. How To Create a Flip Book<http://youtu.be/iExiCGV7jzl>
  3. Bruce Blitz Animation Cel<http://youtu.be/NxR0TJO2LP8>
  4. making a hand drawn animated 16mm film.mov<http://youtu.be/oktGlZQgYWs>
  5. Animation Careers : How to Make an Animated Cartoon<http://youtu.be/KDScLm61Qhk>



**1. Flip book: "Center" with music**

<http://youtu.be/WQGDO4hs76g>

**2. How To Create a Flip Book**

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**3. Bruce Blitz Animation Cel**

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**4. making a hand drawn animated 16mm film.mov**

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**5. Animation Careers : How to Make an Animated Cartoon**

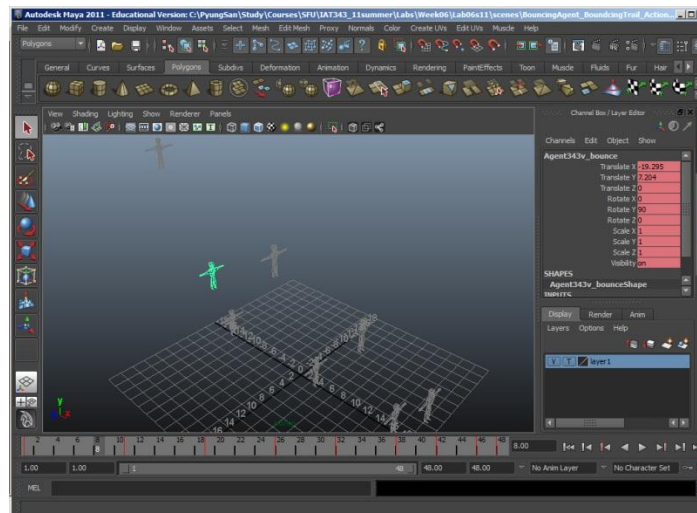
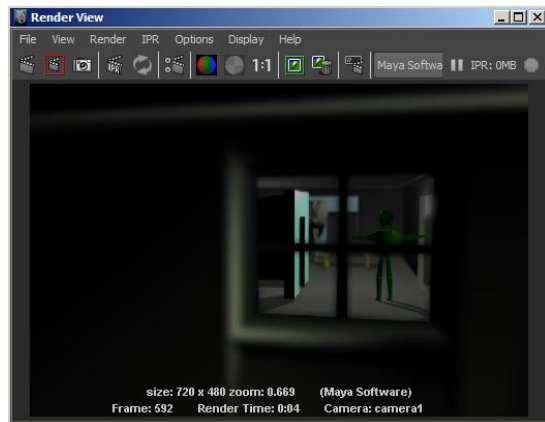
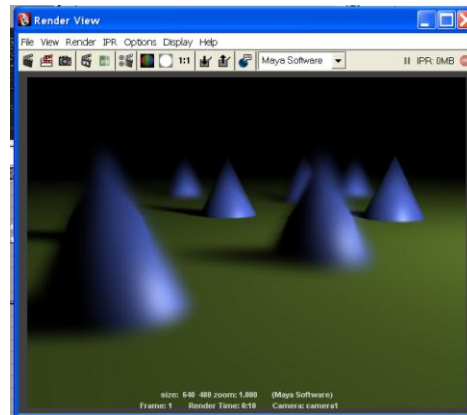
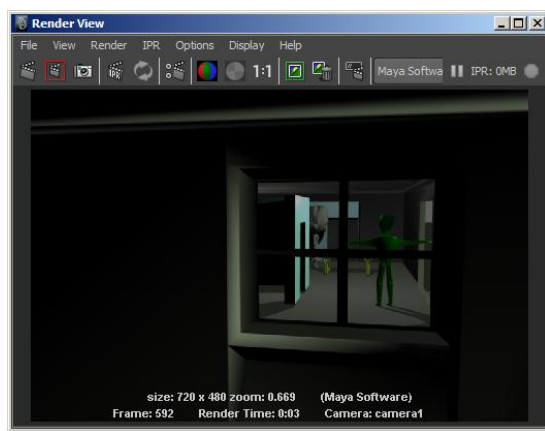
<http://youtu.be/KDScLm61Qhk>

## **Team:** Animatic (animated storyboard/pre-viz with sound)

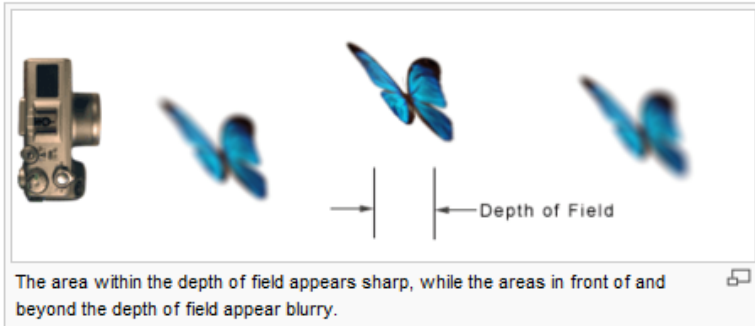
- An animatic (animated video storyboard) is a preliminary version of how your final animation project might look and timed. Including simple camera moves with sound effect (add voice if your character talks), you team can use either 2D version (scanning of your drawings and creating a sequence) or
- 3D version (using Maya, pre-visualize through simple styles like wire-frame, simple shading).
- Here are some links relate to animatic  
Wikipedia ( <http://en.wikipedia.org/wiki/Storyboard#Animatics> )  
Animatics.com ( <http://www.aboutanimatics.com/production.html> )
- Previous Works (storyboard & animatic) in IAT 343  
Examples from previous students  
( <http://www.sfu.ca/~jpw3/iat343/team/draftanimation.html> )  
([http://www.sfu.ca/~yka34/IAT\\_343/team\\_site/animate\\_stb.html](http://www.sfu.ca/~yka34/IAT_343/team_site/animate_stb.html))  
( <http://www.wix.com/apeastudio/iat343> )  
(<http://www.sfu.ca/~ejg8/iat343/TeamPage.html>)  
(<http://www.sfu.ca/~jxh/iat343/animatic.html>)

# Today's Lab

- Focal Length
- Keyframe Animation



# Depth of Field



Source image:

[http://en.wikipedia.org/wiki/Depth\\_of\\_field](http://en.wikipedia.org/wiki/Depth_of_field)

- In photography, the range of distances within which objects will be sharply focused. (Objects outside of this range appear blurred or out of focus.)
- A camera's exposure settings determine depth of field (the region of sharp focus), and whether or not subject matter is crisp or blurred by motion.
- In Maya, all objects are sharply focused by default, no matter how near or far they are from the camera. However, Maya does selectively focus on objects to simulate depth of field.
- You can view the calculated distance of the camera from the object and apply that value to the Focus Distance for the camera to achieve Depth of Field effects in the Camera's Attribute Editor.

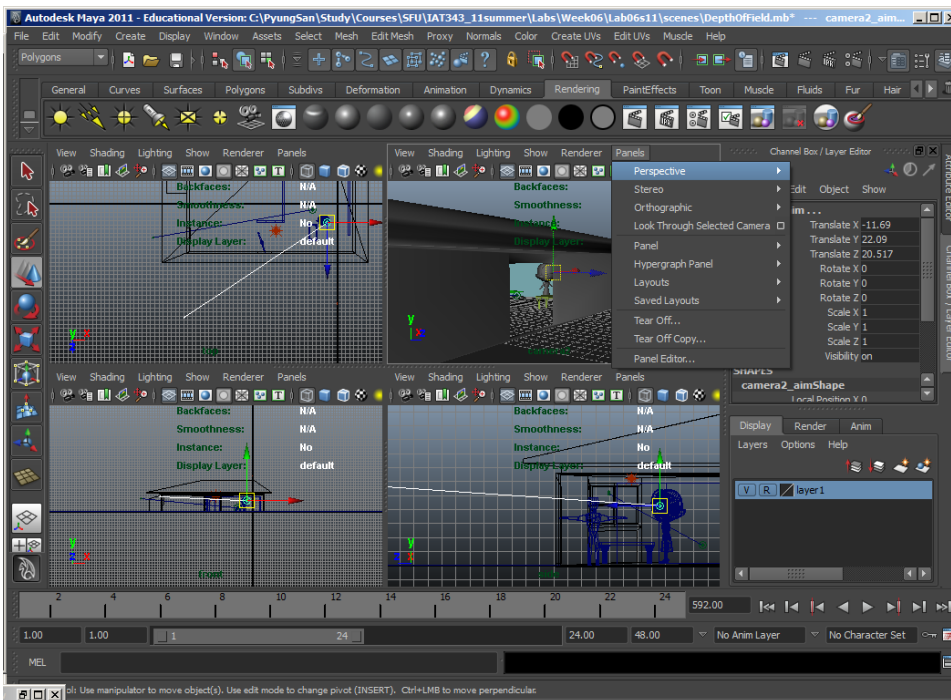
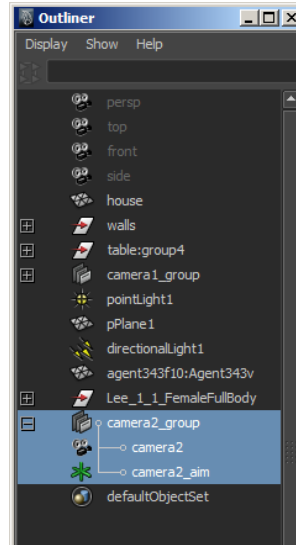
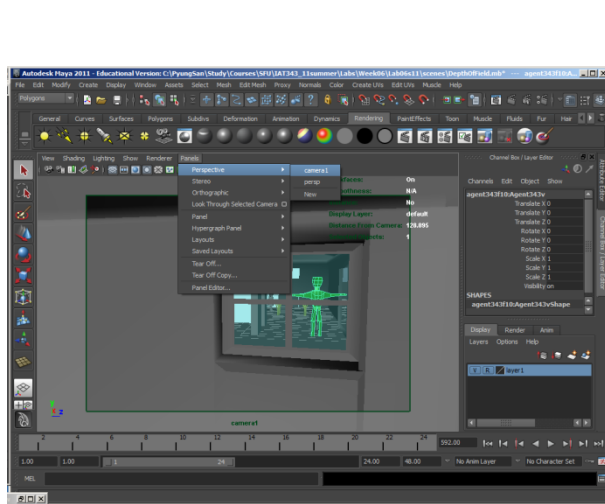


**User Guide > Rendering and Render**

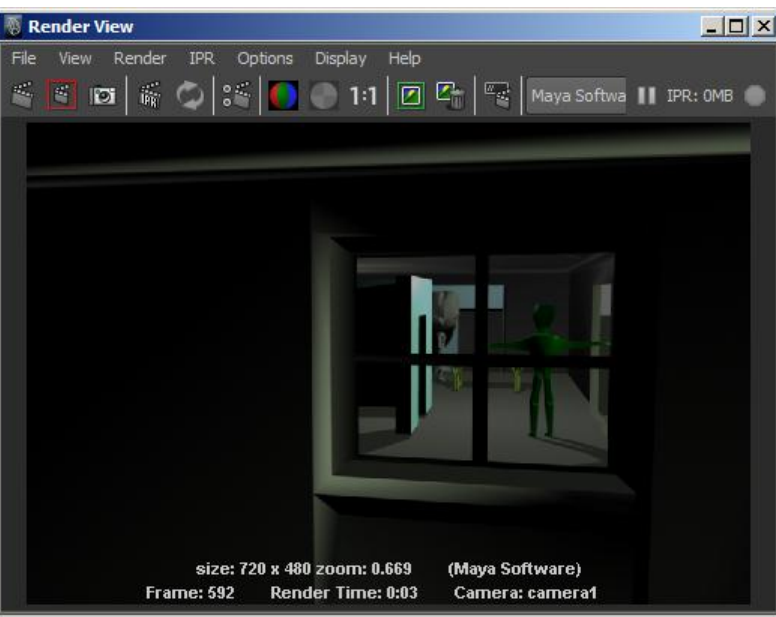
**Setup > Rendering > Camera set up > Create  
and use a camera > Adjust depth of field**

## Exercise 6.1: Depth of Field

1. Open **Lab06\_1\_DegreesOfFreedom.mb**. To simulate the depth of field, we need to get the distance between camera and an object. Select the **agent343** object and select **Display > Head Up Display > Object Detail**. It shows the **Distance From Camera**. Write it down on Notepad (or paper)
2. Currently, rather than using the default camera, new camera called '**Camera1**' is shown in Perspective view.
3. Let's create your own custom camera. Go to **Create > Camera > Camera and Aim**. This time, we have two components of the camera to control the custom viewport: camera body and the aim.
4. To control each component, press '**t**' bring up the **Manipulator Tool**. Using the transformation tool, adjust the position of the **aim** and the **camera** focusing on different objects.







5. To adjust the sharp focus (when rendering the scene), open **Depth of Field** section in the **Camera Attribute** menu.
6. Select the target camera, look for **Depth of Field** section and turn on this function. Render the scene.
7. Play with different values in the **Focus Distance** (try 35, 50, 100 etc.) and render again to see differences.
8. To focus on a target object (i.e., agent), use the value from the **Distance From Camera** in step 1 (**Display > Head Up Display > Object Detail**).
9. Play with **F-stop** to control the level of detail.

Focal length: distance from the center of the lens to the film plane

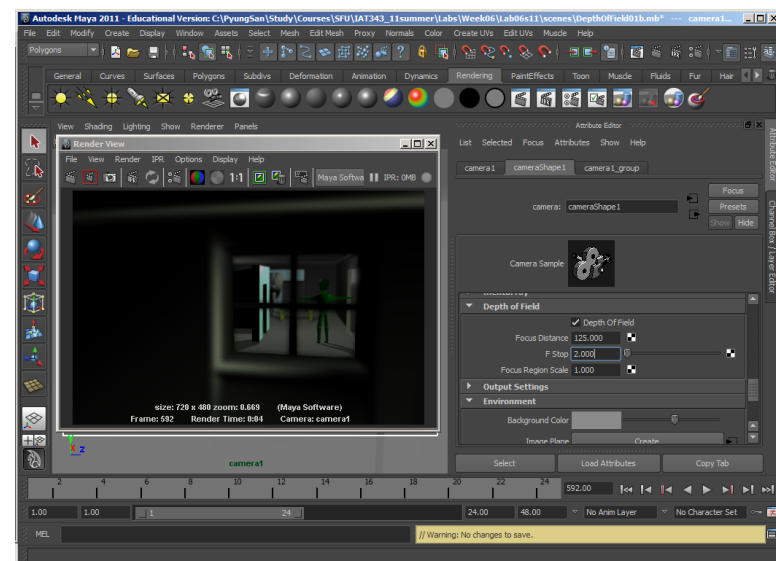
- The longer the lens, the fewer and bigger objects appear on film
- For portrait photo, try 50 - 100 mm.

Angle of view

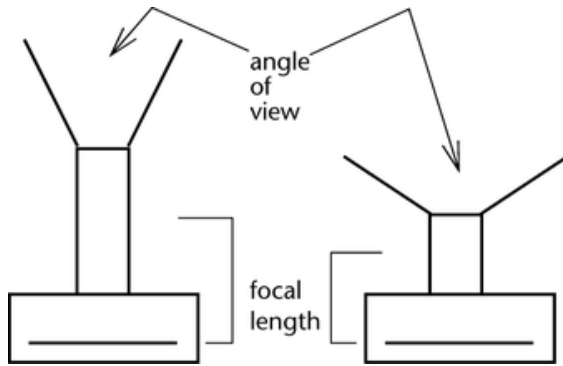
- If the angle is increased, it brings wider view.

Depth of Field

- High F—stop, highly detailed
- Play with focus value



# fStop, Shutter Speed & Focal Length



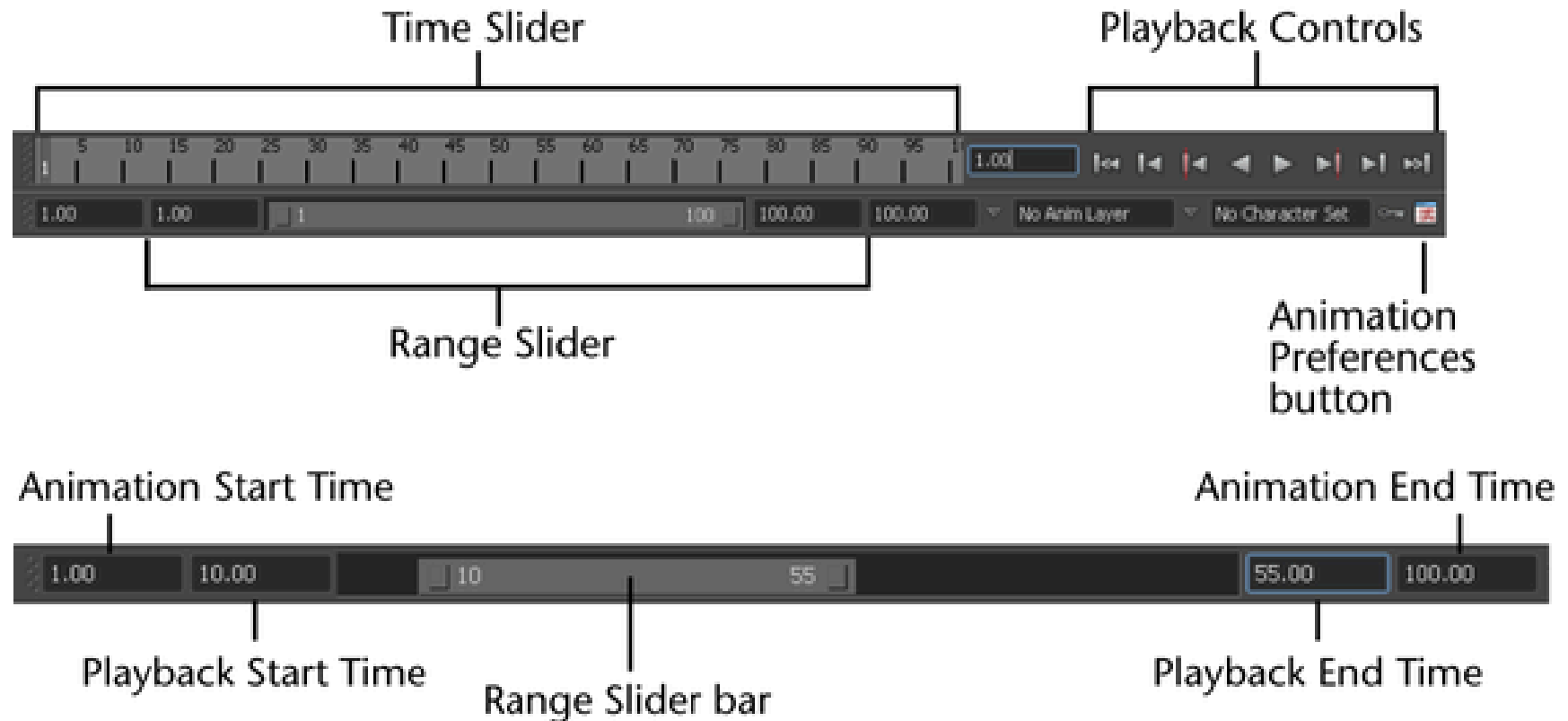
User Guide > Rendering and Render Setup > Rendering > Camera set up > Framing objects with a camera > Angle of view (focal length)

- In real-world photography, together the **fStop** and **shutter speed** (or *shutter angle* for film cameras) determine how much light is exposed to film. However, **fStop** and shutter speed also determine what is in focus, to a certain extent, but for very different reasons.
- The length of time light is allowed to pass through the camera lens to the film is determined by the shutter speed. **The higher the speed, the shorter the exposure time, the less light exposed to the film.**
- The amount of light that is allowed to pass through the camera lens to the film is determined by the camera's aperture setting (also known as the **fStop**). **The wider the aperture, the more light exposed to the film.**
- The focal length of a lens is the distance from the center of the lens to the film plane. The shorter the focal length, the closer the focal plane is to the back of the lens.
- Lenses are identified by their focal length. Focal length is expressed in millimeters or, on occasion, in inches (1 inch is approximately 25mm).
- As you adjust the camera's focal length, the angle of view narrows and expands. This is what causes objects to get larger or smaller in the frame. As you extend the focal length, the angle of view gets narrower. As you shorten the focal length, the angle of view gets larger.

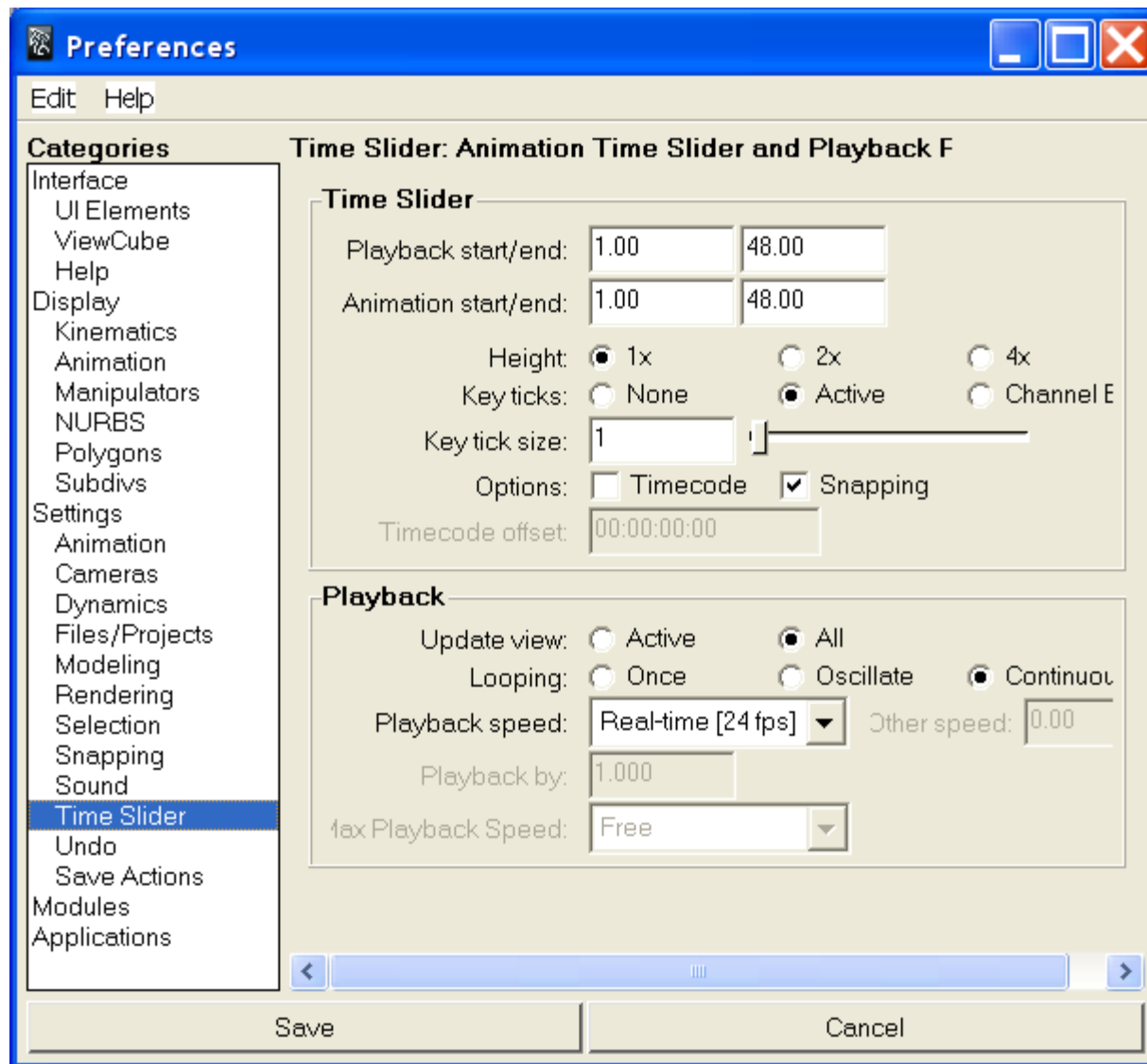
# Animation

Values that change over time.

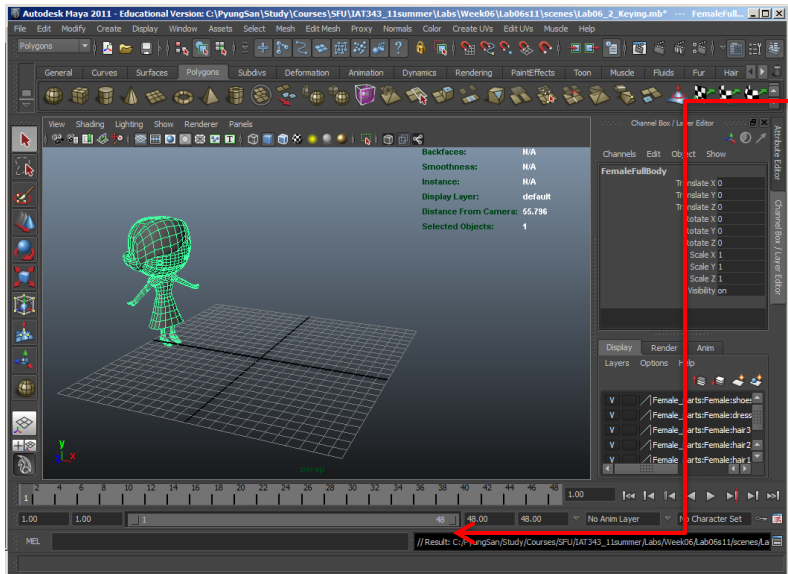
# User Guide > Animation > Animation > Animation Tools > Animation controls



# Adjust Playback Speed



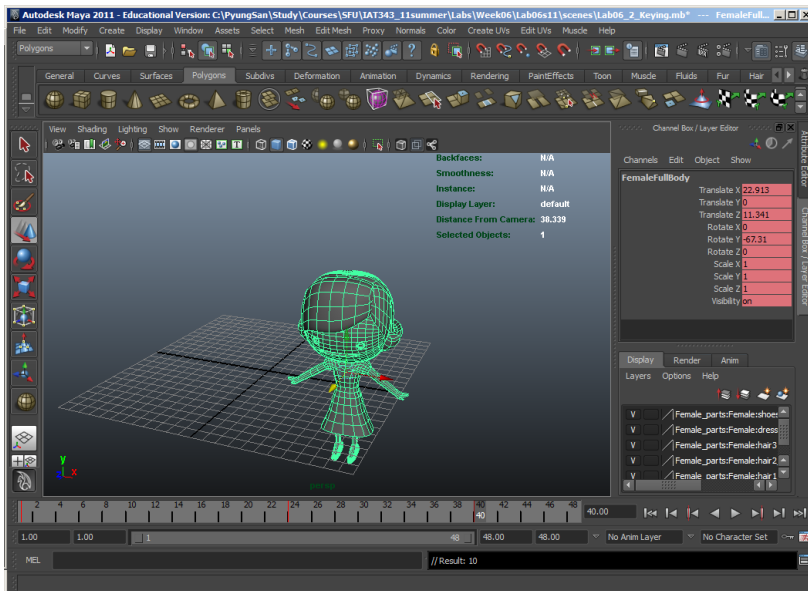
# Ex 6.2 Keying Process



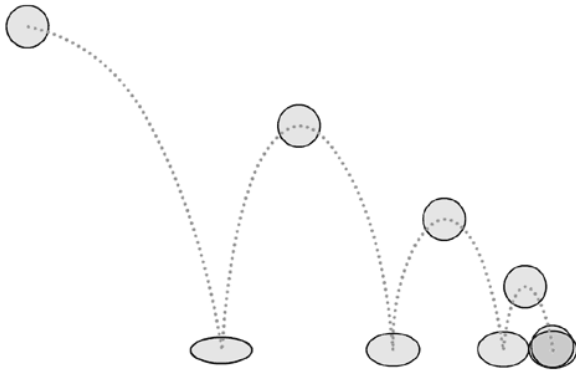
1. Select the Range Slider and adjust End Time to 48
2. Identify and select a target key frame on the Animation timeline. Click on Frame 1.
3. Make an initial pose of an object by applying transformation (translation, rotation or/and scaling) on 3D object.
4. Two ways to apply keyframing:

- a. by press 's'
- b. or in **Channel Box**, select a target transformation attribute (e.g., **Translate X**), press/hold RMB and select **Key Selected**.
- c. Each 'Red bar' displayed on the Timeline shows a confirmation of keying/animated.

5. Repeat previous steps to add another keyframe.
  - a. Click on Frame 24 (1 second) , move the object, and apply transformation to make a pose.
  - b. To add a keyframe, press 's'.

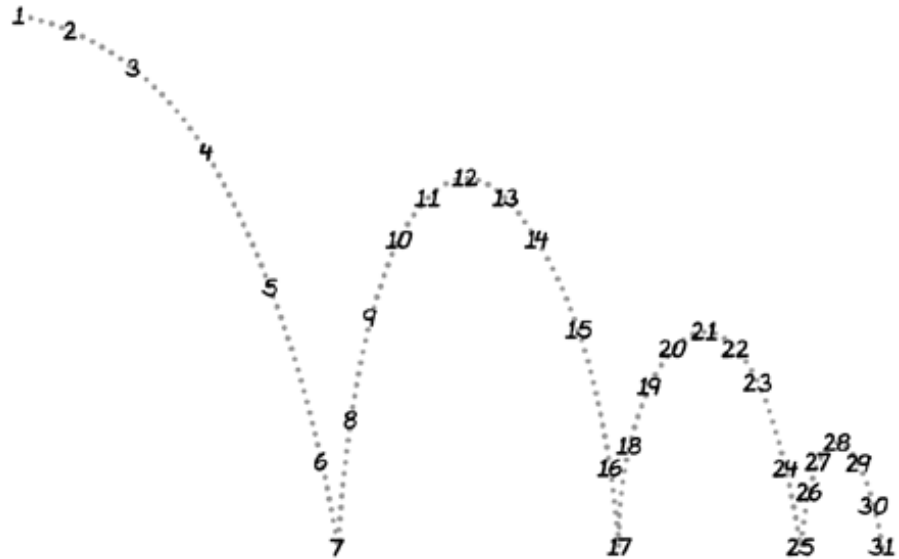


1. To delete a keyframe, click on the keyframe in Timeline, press/hold RMB and select **Delete**. Press Play Forward button to review animation.



## Bouncing Ball

VISIT [WWW.IDLEWORM.COM/HOW/INDEX.SHTML](http://WWW.IDLEWORM.COM/HOW/INDEX.SHTML) FOR AN

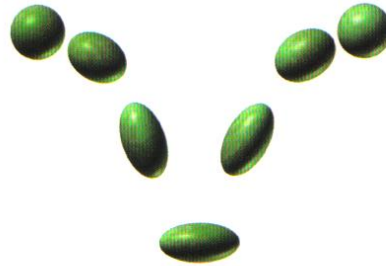


VISIT [WWW.IDLEWORM.COM/HOW/INDEX.SHTML](http://WWW.IDLEWORM.COM/HOW/INDEX.SHTML) FOR ANIMATION TUTORIALS

<http://www.idleworm.com/how/anm/01b/bball.shtml>

# Bouncing Ball

When a ball hits the ground, the force of impact squashes it. Upon recoil, it stretches.



(Maestri, 1996)

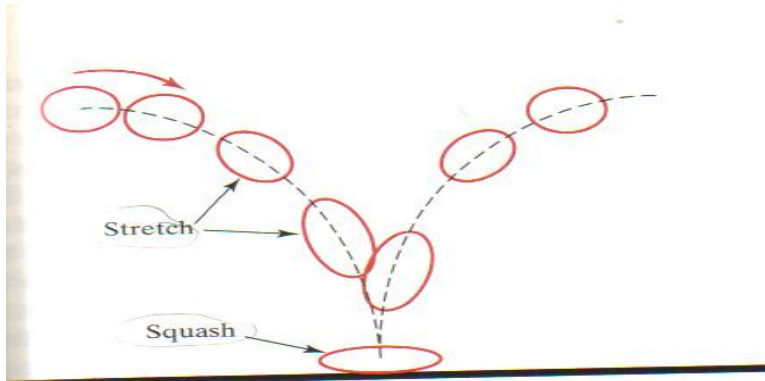
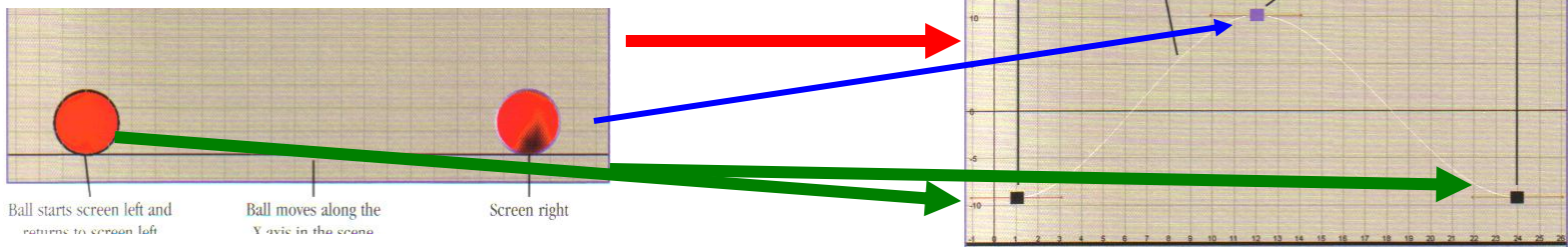


FIGURE 13-4 A bouncing-ball illustration of the "squash and stretch" technique for emphasizing object

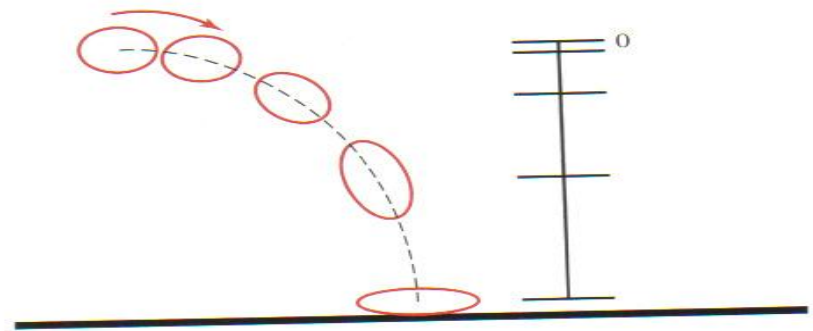
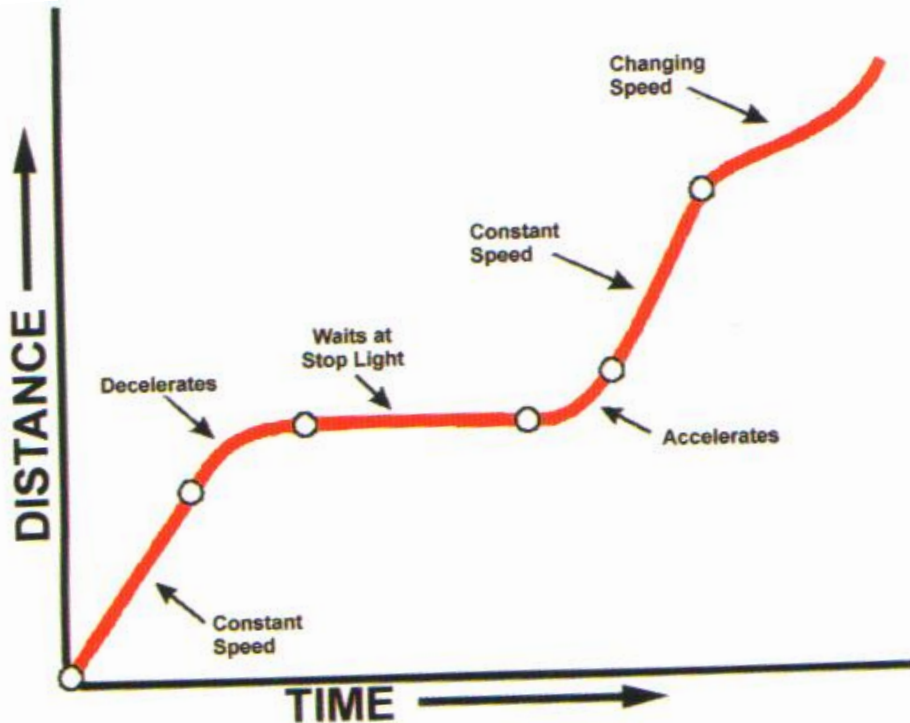


FIGURE 13-5 The position changes between motion frames for a bouncing ball increase as the speed of the ball increases.

(Hearn & Baker, 2003)



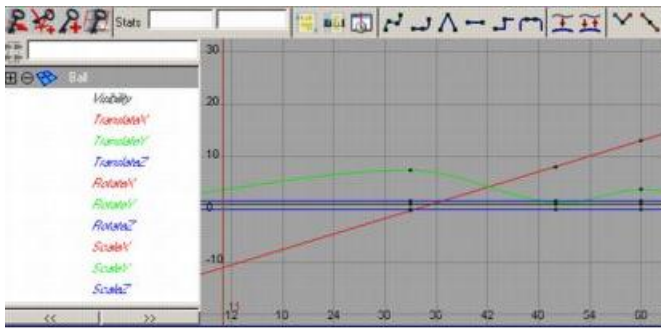
# Understanding Graph



INDIANAPOLIS MOTOR SPEEDWAY



- If graph looks like..
  1. straight, diagonal – steady rate of speed
  2. Curve – accelerating, decelerating or change velocity
  3. Flat – zero speed/stop



# Graph Editor toolbar

Spline Tangents



Clamped Tangents



Linear Tangents



Flat Tangents



Step Tangents

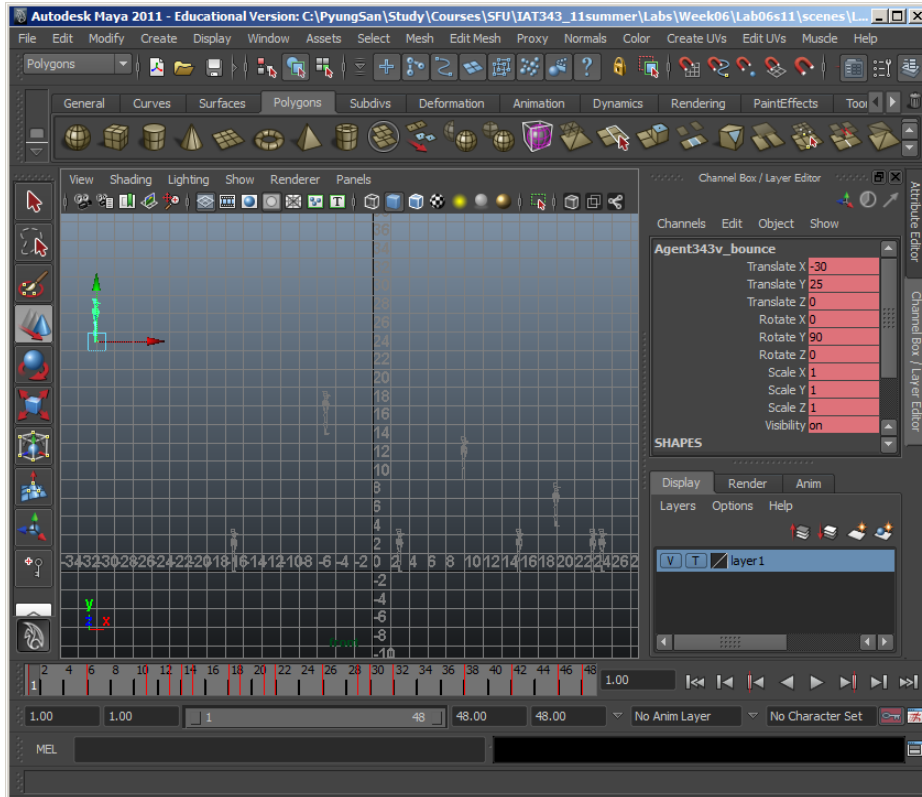


Break Tangents



- Precise control over timing of animation
- Function curve
- Interpolation between keys
- Different Types of Interpolation
  - Linear tangent:
    - Straight line between keys
    - No acceleration, even speed

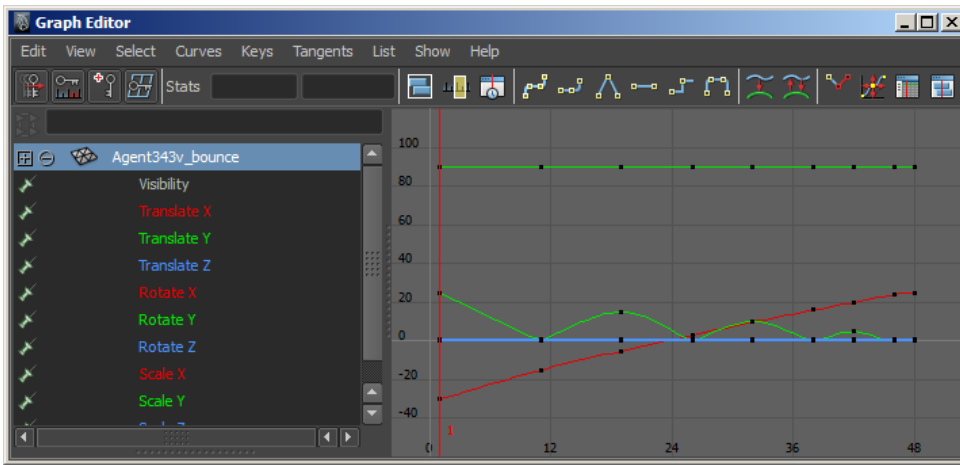
## 6.3 Bouncing Character



1. Click on Frame 1 on the Animation Timeline (black bar). Press 's' on the keyboard to apply key pose (called 'key frame').
2. On the Animation time line, click on the frame 11 which will be 2<sup>nd</sup> key pose.
3. Move the character on top of the second pose and press 's' to apply keyframing.
4. Repeat the previous process to add all the necessary keyframes based on the table (or just create your own timing and character movement).
5. To see the animation, click **Go to start of playback range** button to rewind, and press **Play forward** button.

1 <sup>st</sup> Key Frame	2 <sup>nd</sup> Key Frame	3 <sup>rd</sup> Key Frame	4 <sup>th</sup> Key Frame	5 <sup>th</sup> Key Frame	6 <sup>th</sup> Key Frame	7 <sup>th</sup> Key Frame	8 <sup>th</sup> Key Frame	9 <sup>th</sup> Key Frame
f1	f11	f19	f26	f32	f38	f42	f46	f48

## Add Intermediate Keys through Graph Editor

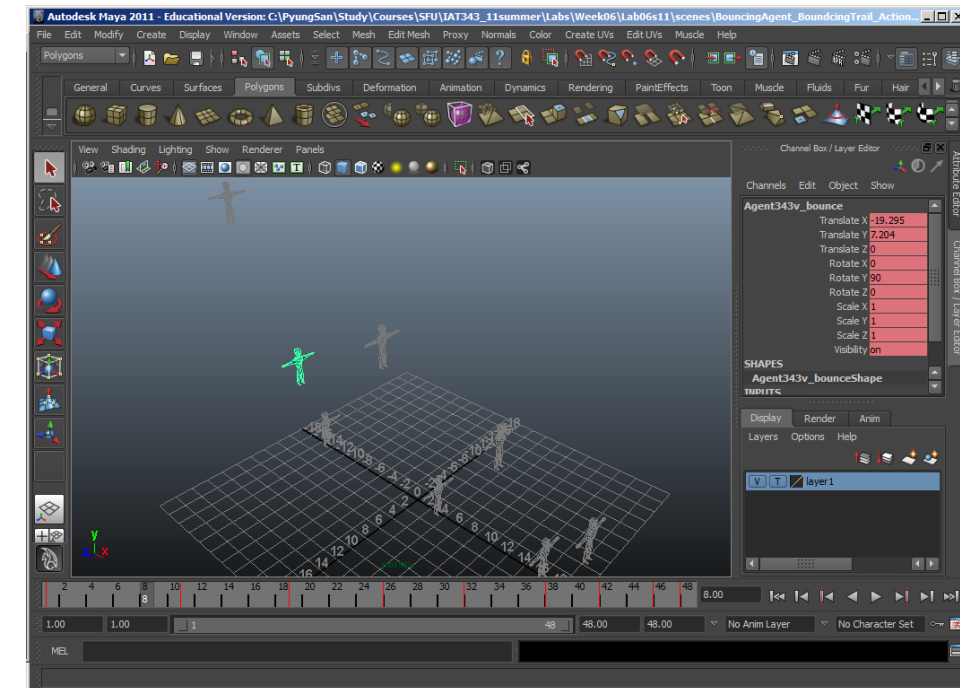


6. Open Graph Editor by **Window > Animation Editors > Graph Editor**.
7. Select the agent to show it inside Graph Editor.
8. Under agent object, select **Translate Y** label (green). To see an entire shape of the curve, Press 'a' to zoom all.
9. In **Graph Editor**, you need to use **middle-mouse button** to adjust key positions as well as to add new key (**Key** icon with the plus sign).

10. Review current key frames by dragging **Current time indicator** in the **Time Slider**. To adjust the position of the ball which is off the track,

- click-drag a selection box around the key.
- make sure that the Move tool is active.
- click-move with your middle mouse button to edit the value of y axis.
- If necessary, adjust tangent handle to control the steepness of the curve

11. You could add more keys directly in the Graph Editor. Click the Add Key Tool (key icon with the plus sign), and click on the curve with the middle mouse button.



Spline Tangents



Flat Tangents



Clamped Tangents



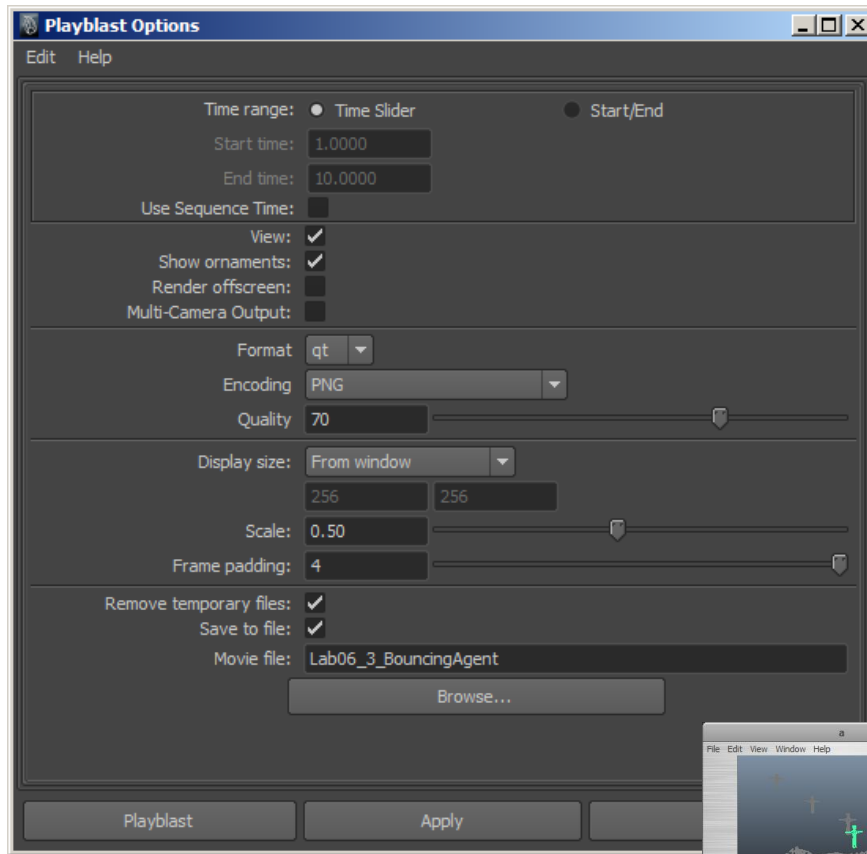
Linear Tangents



Step Tangents



Break Tangents



12. Keep animating the ball through adding more keyframes.
13. When the ball reaches the location where the shape looks more steep (step shape), adjust the shape of the Y axis curve similar to step shape. So, the speed of the ball gets faster.
14. When the ball falls into the water, add floating movements. At the end, the ball will slowly sink and touch the bottom of the tank.
15. Add **Rotation** on the ball.
16. Review your animation and refine the movement. To make it interesting, add scale transformation to simulate squash and stretch.
17. To preview your animation, use **Playblast** which takes a screen grab of the view at each frame. Before choosing this tool, make sure that your perspective view is active (mouse-click on this view). Select **Window > Playblast**.
18. The movie file is saved under 'data' subdirectory (File > Project > New).
19. Save your file and make this video file displayed on your site