

cisc3660  
game programming  
fall 2012  
lecture # 1.4

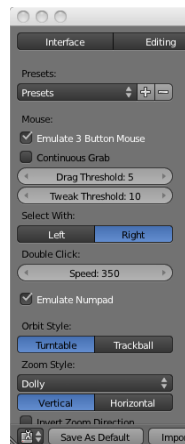
**topics:**

- introduction to blender

## installation

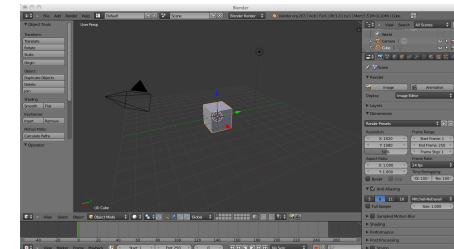
- go to the Blender web site:  
<http://www.blender.org/>
- download Blender for your computer (version 2.63a)
- install it, following directions for your computer
- for installation help, go to:  
<http://cgcookie.com/blender/2010/08/31/into-to-blender-downloading-and-installing/>
- if necessary, go to:  
<http://wiki.blender.org/index.php/Doc:2.6/Manual/Preferences>  
for information about setting up the interface to work with a laptop keyboard and mouse and/or with a Mac

- go to user preferences screen for setting up your keyboard:



## interface and navigation

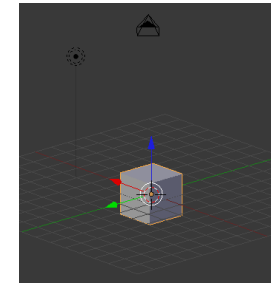
- identify elements on the main Blender screen:
  - toolbar (far left)
  - 3D viewport (middle)
  - outline (top right)
  - properties panel (bottom right)
  - timeline (bottom)



- learn how to navigate the 3D viewport:
  - rotate (*click middle mouse and drag*)
  - pan (*shift + click middle mouse and drag*)
  - zoom ( $\boxed{-/-}$  key to move out,  $\boxed{+/=}$  key to move in)
- use number keys to change views (within 3D viewport):
  - toggle between user view and camera view  $\boxed{0}$  key
  - front view  $\boxed{1}$  key or  $\boxed{Ctrl}+\boxed{1}$  keys for opposite view
  - rotate up  $\boxed{2}$  key
  - side view  $\boxed{3}$  key or  $\boxed{Ctrl}+\boxed{3}$  keys for opposite view
  - rotate left  $\boxed{4}$  key
  - toggle between perspective and orthographic mode  $\boxed{5}$  key
  - rotate right  $\boxed{6}$  key
  - top view  $\boxed{7}$  key or  $\boxed{Ctrl}+\boxed{7}$  keys for opposite view
  - rotate down  $\boxed{8}$  key

## modeling

- objects:
  - mesh
  - camera
  - lamp
  - cube



- selecting objects
  - select objects by *right-clicking* on them
  - *shift right-click* to select multiple objects
  - $\boxed{A}$  key to select/deselect (toggle) all objects
  - $\boxed{B}$  key for “box select” to select things inside a region:  $\boxed{B}$  + *click + drag* to select  $\boxed{B}$  + *middle-click + drag* to de-select
- adding objects
  - *shift A* or use Add from menu bar
- transforming objects
  - scale ( $\boxed{S}$  key)
  - rotate ( $\boxed{R}$  key)
  - translate (“grab”) ( $\boxed{G}$  key)

use *manipulators* in interface:



or keyboard (keys listed above)

- note axis colors:
  - x axis = red
  - y axis = green
  - z axis = blue
- duplicating objects
  - select an object (or objects) to duplicate
  - *shift D* duplicates selected object(s)
  - *right-click* or  $\boxed{ESC}$  key to cancel transaction
- deleting objects
  - select an object (or objects) to delete
  - $\boxed{X}$  key to initiate delete action
  - note that delete action is followed by a confirmation
- objects are comprised of “meshes”
- meshes are comprised of
  - vertices
  - edges

- faces
- *object mode*
  - lets you manipulate different objects (e.g., add, duplicate, delete)
- *object edit mode*
  - select an object (or objects) to edit
  - then select “Edit Mode” from menu in interface (near bottom) (or press `TAB` key)
  - this lets you edit vertices, edges and faces
- extrude tool (in object edit mode)
  - lets you morph object shape
  - select face(s)
  - `E` key to extrude (push out) face(s)
- delete (`X` key) in object edit mode lets you delete part of an object (e.g., vertices, edges, faces)

## materials

- change the color and texture of objects
- on the properties panel, click in “material” button
  - click on “new” to add a material
  - you can name the material
  - then adjust property settings
- properties:
  - diffuse
    - \* to change color
    - \* a color wheel is displayed, and then move arrow out of the color wheel window for color change to take effect, or `ESC` key to cancel
  - specular
    - \* to adjust lighting that falls on object
    - \* can adjust color, intensity, hardness
    - \* hardness is high for reflective materials (like glass or metal) and low for non-reflective materials (like fabric or wood)

- transparency
  - \* to adjust transparency
  - \* set alpha value: 1.0 = opaque, 0.0 = transparent

## animation

- animation works by placing object at certain along positions along the timeline
- *left-click* and drag small green bar in timeline
- notice that the frame numbers change (in the lower left corner of the viewport and also in the frame number button)
- default frame rate = 24 frames/sec
- default animation length = 250 frames
- `I` key to insert a “key frame”
- LocRotScale to insert object’s position (location), rotation and scale for that keyframe
- then move to another point along the timeline and move the object
  - use `G` (grab/translate) to move object in viewport
  - then `I` to insert key frame
- another way to create animation is to use the *record* button in the interface
  - turn on recording

- then manually drag object(s) around (using **G** etc.)
- turn off recording when done

## rendering

- rendering allows you to export your final object with all its properties
- export format can be:
  - image
  - video
- rendering exports WHAT THE CAMERA SEES
- so make sure you check your camera position/viewport before you render; otherwise, you might not see what you expect to see in the rendered output
- in the *render* panel (select on right side of interface), click on *image* to view what the camera sees; click **ESC** to go back to normal view
- rendering asks if you want to use *anti-aliasing* — which smooths lines (transitions) if used
- **F3** function key to save rendered object as an image or a movie

## lighting

- use the LAMP object
- “Lamp” properties let you set different things like type of lamp, color, hardness of light, etc.
- you can also add lamp objects, to have more than one light source on your scene

## references/resources

- USER MANUAL:  
<http://wiki.blender.org/index.php/Doc:2.6/Manual/>
- TUTORIALS:  
<http://cgcookie.com/blender/get-started-with-blender/>