

Project A: Cattails and Dragonflies Swamp Scene

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User Guide

Introduction

Upon loading the scene, the user will be met with a scene of four cattails swaying in the wind with a dragonfly flying around them. If the user does not interact with the scene, the cattails will continue to sway and the dragonfly will fly around the screen at random. There are two user menus -- “Show Help” and “Open Controls” -- located to the top left and top right of the screen respectively. The user can click on these to interact with the scene.

Open Controls Menu

Upon opening the drop-down menu, the user will see five subsections as shown in Figure 1. The functionalities of each of the menus varies.

Animations

This menu allows the user to toggle animation (pause and unpause the scene) and to toggle cattail sway. Both options can be modified by clicking a blank box to the right of the toggle descriptors “animate_toggle” and “cattail_sway” as shown in Figure 1.

Position

This sliding menu allows the user to change the x,y, and z coordinates of the entire scene. To do so, click and slide the bars next to the command descriptors “global_x_pos”, “global_y_pos”, “global_z_pos” as shown in Figure 1.

Scale

This sliding menu allows the user to change the x,y, and z scale of the entire scene. To do so, click and slide the bars next to the command descriptors “global_x_scale”, “global_y_scale”, “global_z_scale” as shown in Figure 1.

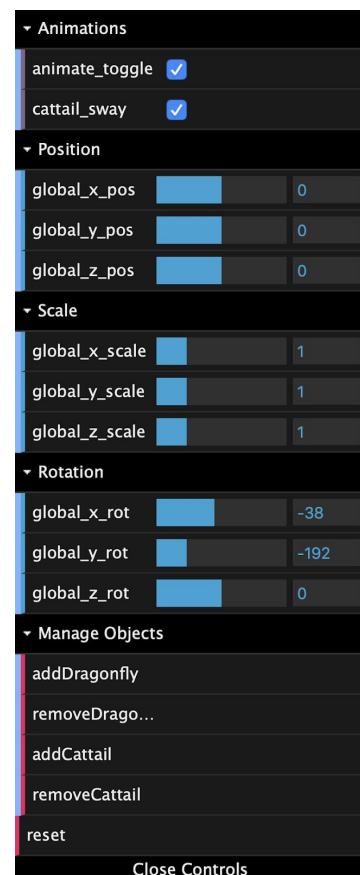


Figure 1 -- Controls Menu

Rotation

This sliding menu allows the user to change the x,y, and z rotation of the entire scene. To do so, click and slide the bars next to the command descriptors “global_x_rotation”, “global_y_rotation”, “global_z_rotation” as shown in Figure 1.

Manage Objects

This menu allows the user to add and remove objects. The user can click on the “addDragonfly” and “addCattail” descriptors to add dragonflies and cattails to the scene respectively. The user can click on the “removeDragonfly” and “removeCattail” descriptors to remove dragonflies and cattails from the scene respectively.

Extra commands

At the bottom of the menu, there is a “reset” button which can be used to reset all the values modified in this menu to their original state when the scene was first rendered. When the user is finished with the menu, he or she can click on “Close Controls” underneath “reset” to collapse the drop-down menu.

Show Help Menu

This drop-down menu (Figure 2) describes the keyboard, mouse-click, and mouse-drag interactions.

Keyboard Interactions

The user has several options for keyboard interactions:

1. The “\” key will toggle the Show Help Menu.
2. The “.” key will toggle the Open Controls Menu.
3. WASD or the arrow keys to move up, down, left, and right from the user’s point of view.
4. The “+” and “-” keys to zoom in and out.
5. The “P” key to pause.
6. The “R” key to reset all user related manipulations.
7. Numerical Keys 1,2,3,4,5,6,7,8,9,0 (on the number row) to set the wind strength effect (lowest to highest) on cattails.

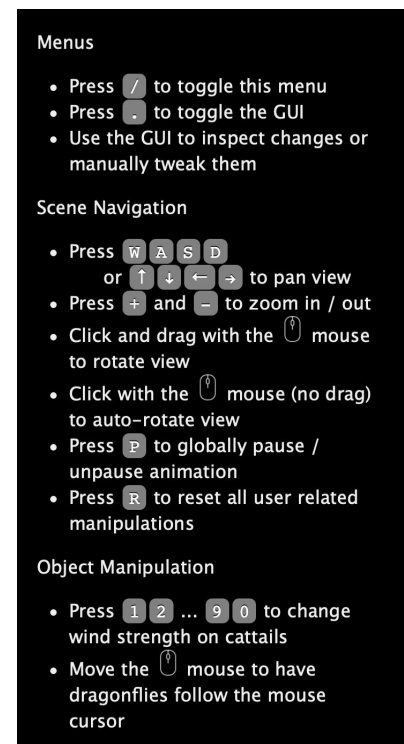


Figure 2 -- Help Menu

Mouse-Move Interactions

The user can move the mouse around the screen and the dragonfly will follow the cursor.

Mouse-Drag Interactions

The user can click and drag the mouse around the screen to rotate the view.

Mouse-Click Interactions

The user can click the screen to stop and start auto-rotating.

Results

Upon loading the page, the user will be met with a scene of four cattails swaying in the wind with a dragonfly flying around them. If the user does not interact with the scene, the cattails will continue to sway and the dragonfly will fly around the screen at random. Start to move the mouse and the cursor will be set to a mosquito. This initial set-up ($t=0$) can be seen in Figure 3 with the moment right after the initial rendering ($t=1$) can be seen in Figure 4. In these images, the cattail can be seen to sway from their initial position in Figure 3 to a new position in the Figure 4. The same can be said for the dragonfly.

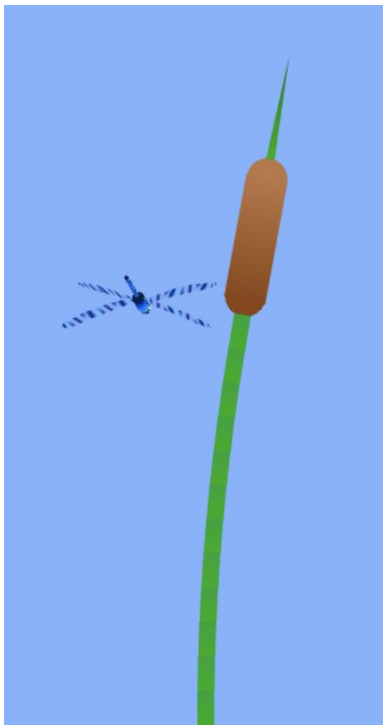


Figure 3 -- Initial Scene Set-Up ($t=0$)

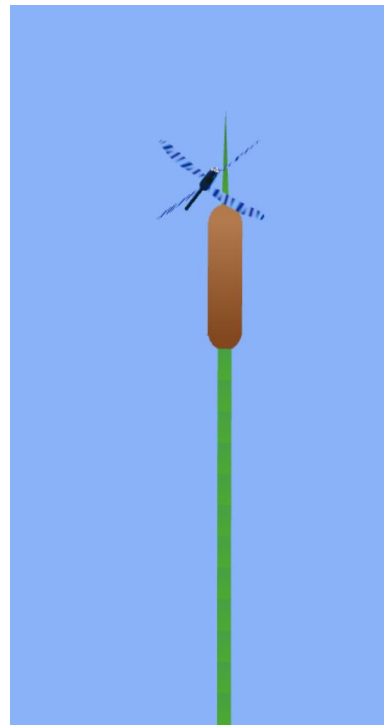


Figure 4 -- Initial Scene Set-Up ($t=1$)

To see an example of some of the user interactions in action, see Figure 5. This figure shows the addition of two dragonflies to the scene. Notice the translucency of part of the dragonfly's wing pattern. In Figure 6, one can see the effect of rotating the screen using the mouse-click-and-drag feature described in User Guide.

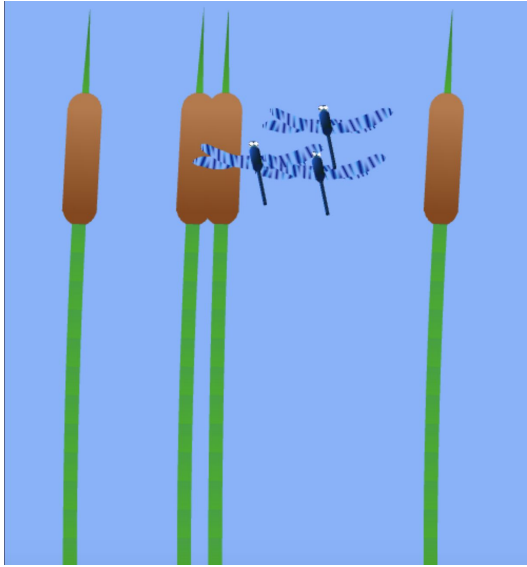


Figure 5 -- Additional Dragonflies

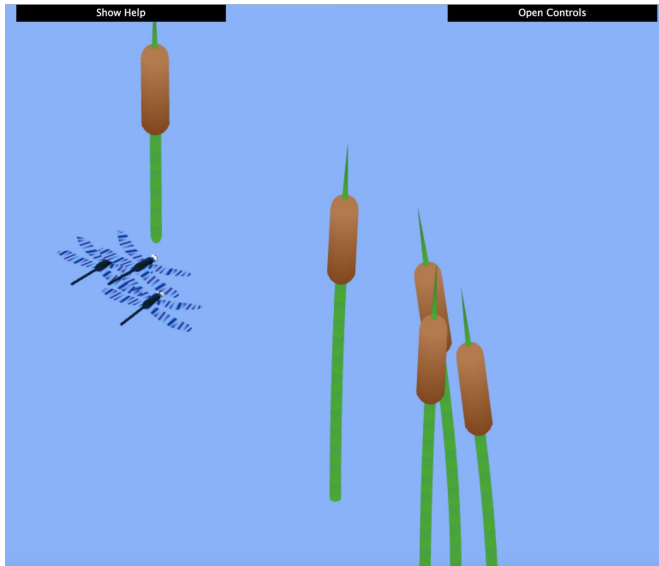


Figure 6 -- Click-and-Drag Rotation

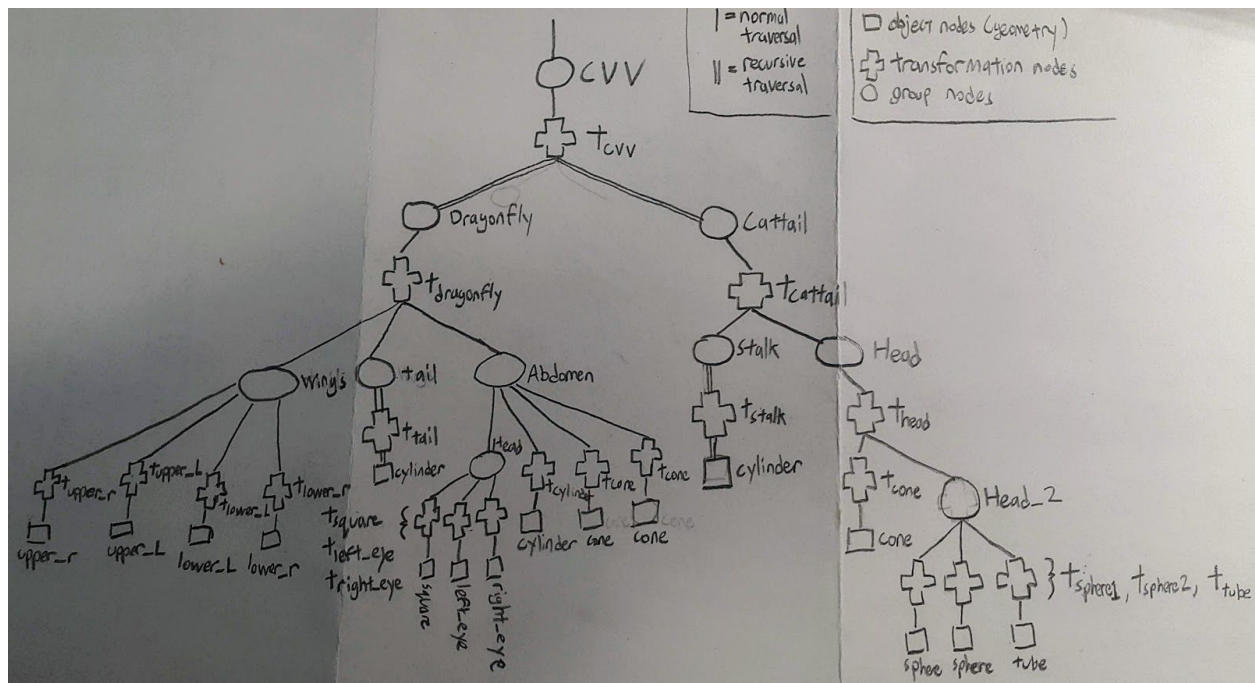


Figure 7 -- Scene Graph Sketch

Note the unusual case that t_{head} (under the *Cattail* lineage) has two children. This is because our project applies an extra transition (t_{cone}) to only the *cone* object node, thus differentiating it from the rest of the object nodes under the *Head_2* group.