

User guide

Program allows users to adjust several variables to see the different of fire path. The different fire growth behavior would be created from the different environment factors. The following variables are the necessary factor that users would be able to adjust the value.

1 Weather of area

1.1 Scene moisture

This variable would affect the fire rate of growth. Thus, whenever user wants to speed up the fire spread, user needs to decrease the scene moisture until it reaches the minimum value, which it is zero. Nevertheless, if user wants to see the slower fire spread, the scene moisture should be increase.

1.2 Scene temperature

This variable would work similar to the scene moisture variables. However, it gives the smaller effects to the fire scene when the single step is adjusted. In addition, if user adjust the temperature every 20 step, the moisture would automatically change with half of the latest amount moisture value because these two variables has related together, followed by the humidity rules in real world. For example, if the temperature has decreased from 40 to 20 degrees, the moisture would also be decreased from 20 to 10 percents.

2 Appearance and Camera section

These two sections do not relate to the fire growth prediction. They are just the viewing adjustment of the program.

The appearance section is for toggle the scene appearance from wire frame to texture mapped scene and toggle the origin mark showing status. Thus, if user does not want the mark of origins in the scene, user needs to uncheck the 'show mark' check box.

In the camera section, the different camera from different view will be available to choose the viewing of the program. Moreover, user can zoom in and zoom out the scene by clicking the zooming button.

3 Terrain enable

The terrain scene would be initially implemented when the program first runs. Thus, to see the different fire growth from the area with slope and flat area, user should disable the terrain function and click the generate button.

If the terrain is enabled, user would be able to adjust these following variables.

3.1 Terrain iteration numbers

This variable states to the iterations of terrain within the scene. More number of iterations, more mountain or terrain would be generated.

3.2 Random button

This button is for creating the new terrain scene with the same value of iterations number.

3.3 Terrain height increase and decrease buttons

User can adjust the height of terrain by clicking the increase (+) or decrease (-) button inside the terrain box. Thus, the terrain would be higher or lower than the initial creation.

4 Wind enable

The scene would add the wind function to be considered with fire path prediction, if the wind enable box is checked. If the wind is enabled, user would be able to adjust the direction and wind speed value.

5 Fire seed

This variable refers the origin of DLA structure that would represent as the fire path. The amount of fire seeds can be increased up to 5 points. Thus, the program would generate 5 fire path at a time. When the amount of origins has been adjusted, the new origin will be assigned

with the random position. Moreover, user can move the fire seed to the satisfied position by choosing the index of fire seeds and clicking the direction buttons. When the index number of fire seed has adjusted, user can notice which fire seeds is about to be moved in the scene by looking for the yellow fire seed.

6 Fuel object

This sections would adjust the amount and variables of fuel object, both flammable fuel and non-flammable fuel. Amounts of both fuel types can be changed. When user adjusts each fuel amount, program would clear the scene and randomly locates the fuel into the scene, respecting to the new assigned amount number.

For flammable object, user can select the specific object and adjust its size. Height and radius of the fuel object is available for user to adjust. Moreover, the moisture of the fuel object can also be changed. When the object moisture is changed, program would decrease the value of transparency, therefore, those fuel objects would have opaque surface, and vice versa.