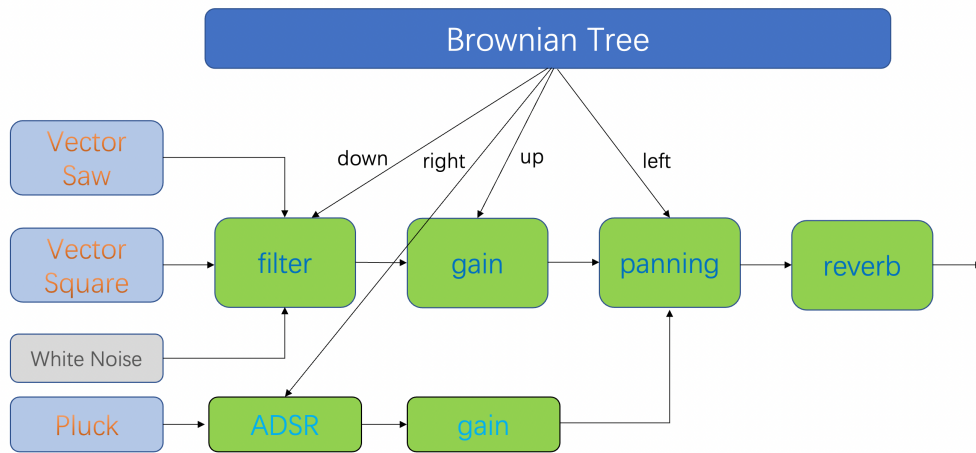


Assignment 2.0

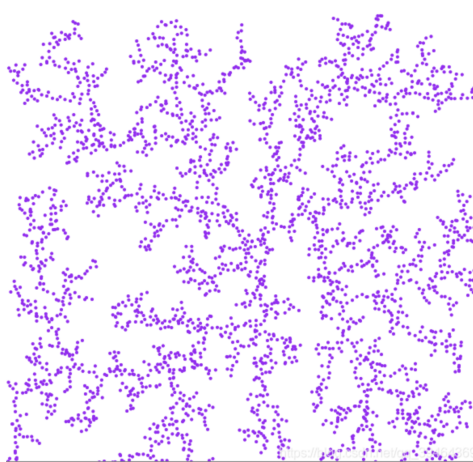


Intro:

I named this project “Growth” mainly because it aims to describe a growing tree. All the sound elements are related to the theme of the project, growth. There are mainly 5 parts in the project: Brownian tree, rich sound, pluck sound, gain, and panning.

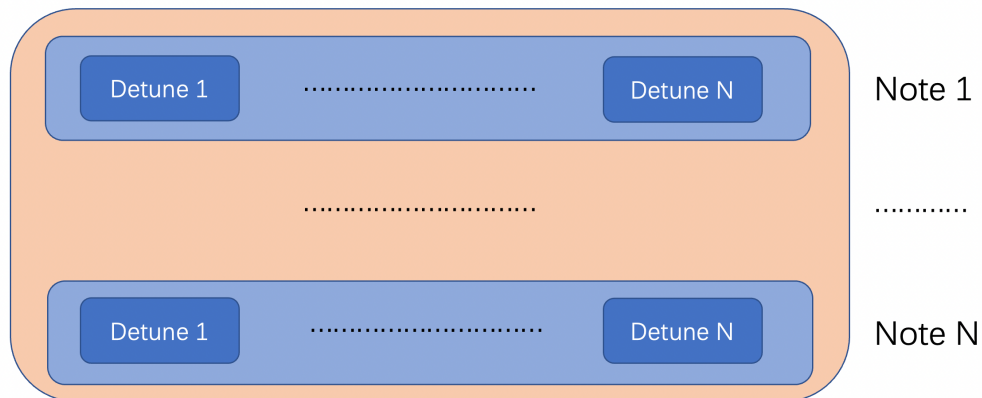
Description:

Firstly, the Brownian tree, which is the most significant part of this project, is also called Diffusion-limited Aggregation(DLA). At first, I set a fixed molecule, and then, some other active molecules are doing Brownian motion, which, as we all know, is a kind of random motion. When the active molecules move next to the fixed ones, these active molecules will be fixed as well. At last, all the fixed molecules become a unity, which is like a



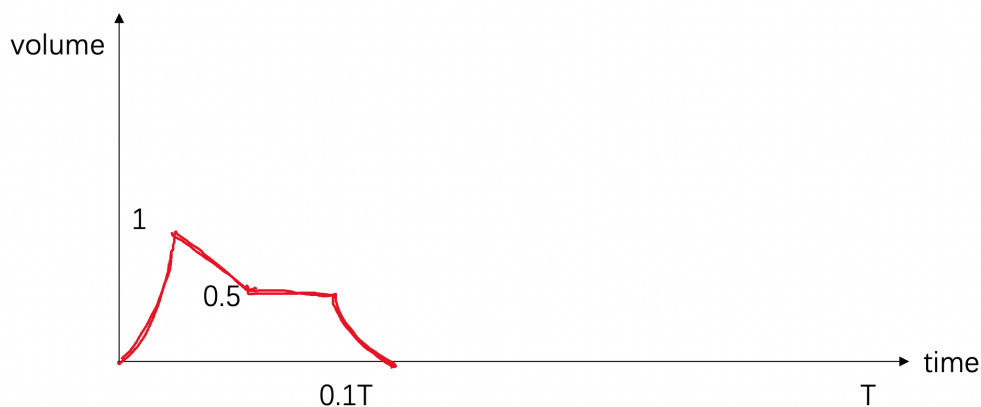
tree. The picture in the left shows what a brownian tree is like. What's more, I set four outputs which reflect how much the tree grows in each direction, and I use these four outputs to modulate some important values.

Next, rich sound, which is the main part of sound generating in this project. In this class, I create a group of saw wave sound and a group of square wave sound.



Each group contains several different notes, which the frequency and the quantity can be set. Inside the group, each notes can have many sub-oscillators with detunes which can be set as well. Therefore, these two groups can make a very rich sound. After this, I also add a little white noise in order to make the sound warmer. Then, I set one sin wave LFO to modulate the filter's cutoff frequency, and I use one direction growth of the tree to modulate this sin LFO. So with the time passing by, the tree grows up and up, and the cutoff frequency range of filter will be wider and wider.

Third, pluck sound. In this part, what make sense the most is the ADSR.



The picture shows how my ADSR works through a whole T. I create an envelope class which inherits from the phasor class. Also, I use two sin waves and one triangle waves and use this ADSR to modulate the volume of the pluck sound so that it will sounds like heartbeat, which is mainly a symbol of living things. Also, I use one direction growth of the tree to modulate the speed of heartbeat. With the tree growing, the heartbeat will be faster and faster.

Fourth, the volume. I use one direction growth of the tree to modulate the volume. Thus, with the tree growing up, the volume will be higher and higher. What's more, the volume will grow slowly at first, but it will grow much faster with the time passed by because as the tree grows, there are more and more fixed molecules, so the active molecules will be easier to get

caught by the tree.

Fifth, the panning. I make a pan class with stereo output. I use a sin wave LFO to modulate the panning, so it will move from side to side. What's more, I use one direction growth of the tree to modulate the width of the panning. So at first, the sound is in the central, but with the tree grows, the width of panning will be wider, and the sound will gradually move from one side to the other.

Last but not least, I send the whole sound buffer to a reverb function, so that the sound becomes milder and more beautiful.

Future work:

I've made some member functions which can return each new fixed molecules' x and y position in Brownian tree class. So, if a UI interface is made, the whole process of the tree growing up will show on the screen, so the listener will know how exactly the sound generates. I know it's not that hard to make an interface, however, I don't have enough time for this, so perhaps I will do this thing in the future.

Update: add two interactive buttons, controlling the speed of the tree's growth