EXPRESSION THROUGH FLIGHT - APP

CART 353 Final Project Report
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DESCRIPTION OF PIECE

The concept of this piece orbits around sound visualization, emotion and choreography. It is also user-friendly by channeling interactivity through sound input and the keyboard. The sketch displays a luminous purple-like enchanted forest with fireflies floating through tree trunks and branches. The background is drawn in a way that gives a depth effect without using 3D in the code. Rather than implementing a z axis, two images are loaded in the sketch and while one is drawn before the fireflies, the other is drawn after : making them fly over and behind certain trees. The fireflies behavior are influenced according to the sound input and is modified whether high or low frequencies are recorded by the microphone. The frequencies influence the force applied to the acceleration vector of the fireflies. Also, the volume influences the speed of the fireflies and the orientation of the vector in the flowfield. The fireflies also adapt their behavior according to a flocking aspect, controlled by the keyboard ("+" or "-"). Three luminous globes are placed through the forest and acts as attractors or repulsors according to the volume of sound detected by the computer. When the volume is high enough, the fireflies will tend to avoid these globes and will go hover over them when the volume is low. This gives the orientation of movement of the fireflies through the forest, creating the organic motion of the cloud of luminous creatures. The sound input will be received by the song played on a computer or someones voice. This piece, considered as an app, may also be a screensaver for a computer and will respond to the music playing on it's speakers as it has unique reactions to each input. Different musical instruments and different songs can also be visualized with this piece. The users get to observe how the sound waves resonate through the fireflies activity. This project is licensed under GNU LGPL v3.

DESCRIPTION OF INTENTION

I was greatly inspired by the works presented below. By their magical feel, glowing colors, organic movement, pulsation and fairytale-like vibrance. In CART 212, we are currently working with sound visualization, with After Effects rather than Processing. We are to mirror the audio of a song of our choice with visual from a library of images and videos with specific appearances and movement. I want to increase this experiment with a live aspect: instead of being pre-set, the sound visualization will pulse and move as the computer records sound. The idea is the fireflies will not only visualize the sound of a specific source, but also transmit emotion and feeling with the motion in its flight and the speed in its movements. They are like the hum of a tune, like the ora of an musical instrument.

INSPIRATION

FORESTA LUMINA

http://forestalumina.com/en/ Foresta Lumina is a project realized by Moment Factory for the first time in 2014 in Coaticook. It is an outdoors and nocturne experience where you walk upon a path through the woods and across a bridge. Along the path are a series of electronic, digital art and sculptures. These pieces compose a fairy's and folks tale of the creature's in the woods and how wishes are granted. There are holograms of fairies dancing in the forest, glowing little lights in the hills, lightning flashing in the trees and projections upon cliffs and trees of stories witnessed by the place itself.

HAKANAÏ
https://www.youtube.com/watch?v=qAYAuJ9dIlE
This piece is a choreography realized inside four glass walls where are projected a series of forms and images that react to the movements of the dancer, who interprets the live music. The performance has a black a white theme and is built with intertwining lights and shadows. It is an interaction between the projected media and the physical movement of the dancer. The message passed to the observers is Hakanaï, rooted in Japanese culture. Hakanaï is a word expressing what is fragile, in between, what isn't reality or imaginary but the elusive bridge linking the two.

TINT & SATO :: ROUGE DÉMO
https://vimeo.com/156874831 Tint (thisisnotdesign) is a group of Montreal artists - video artists, photographers, VJ's – who explore the sound and video, image medium. This piece was presented at Nuit Blanche 2016 on February 26th at SAT – Sociétés des Arts Technologiques. As several other pieces of their portfolio, ROUGE DÉMO is a sound visualization of live audio (ATTLAS – Sunset Over Manaan). They work with errors that appear while compressing their videos, with signal interference and layers. This technic gives an authentic, glitchy and alternate universe feel. Their live aspect goes both ways; while the sound inspire the visual textures, the visualization also inspires the music creation.

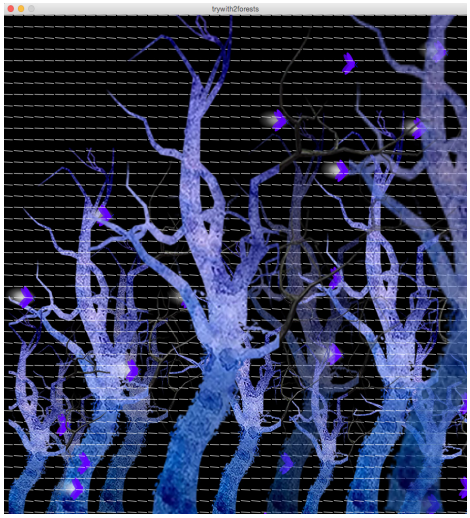
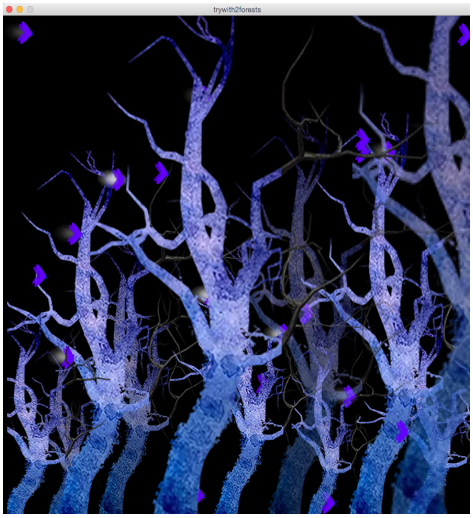
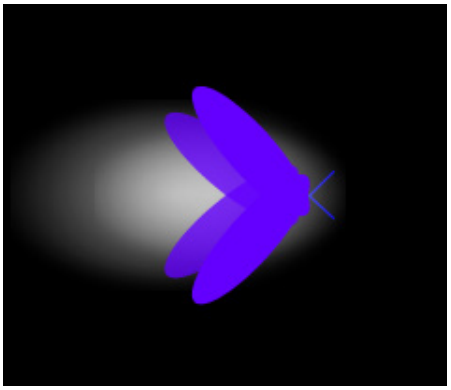
calendar

weeks	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
swarm effect							
flowfield							
behavior change							
attractors/re							
choose song							
firefly response							
app/screensaver							

roadmap

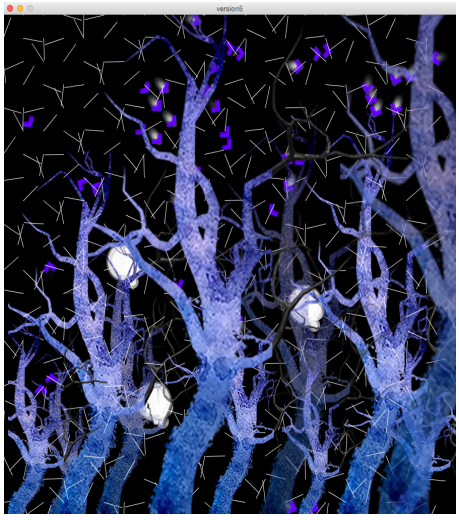
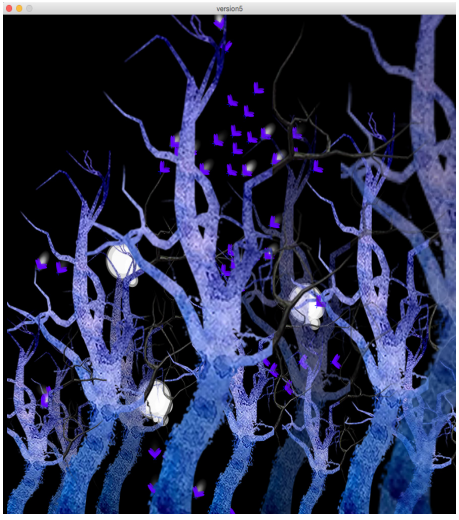
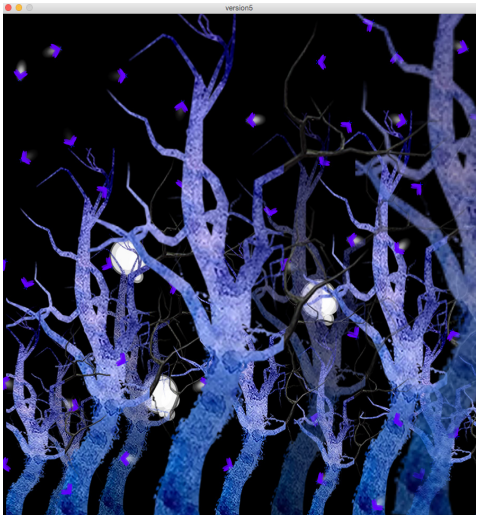
Final feature / task	Current status	Completion (%)	Time (h)	
			Planned	Spent
Visual Interface				
Firefly designs (evolution)	Jitter wings + pulsing glow	100.00%	0	3
Animated background	Overlay forest images + luminous globes (repulsors)	100.00%	0	2
Behaviours				
Swarm effect (flocking)	-Adjusted forces (separate, align, cohesion) -change accord to keyboard input	100.00%	5	5
Behavior change in firefly activity (flow field)	-fireflies follow flowfield (angles of vectors change according to volume) -application of forces as vectors according to frequency recorded -speed change according to volume	100.00%	7	8
Repulsor class (Hover)	-implement forces of repulsion applied to every element in flock when volume is high -implement forces of attraction applied to every element in flock when volume is low	100.00%	5	5
Sound				
Choose/write guitar song	Choice of an existing song instead	0.00%	6	0
Link volume of frequencies from guitar to audioInput	-Created audio data class (AudioInterface) with two methods (detect average frequency and current volume) -if statements in run() of FireFly class to fire sections of code depending on frequencies detected	100.00%	5	15
audioOuput (fireflies response)	Change of plan, no audioOutput response	0.00%	5	0
Final output				
Make into app of screen saver	Eventually!	0.00%	6	0
Total			**39**	**38**

PROTOTYPE

flowfield

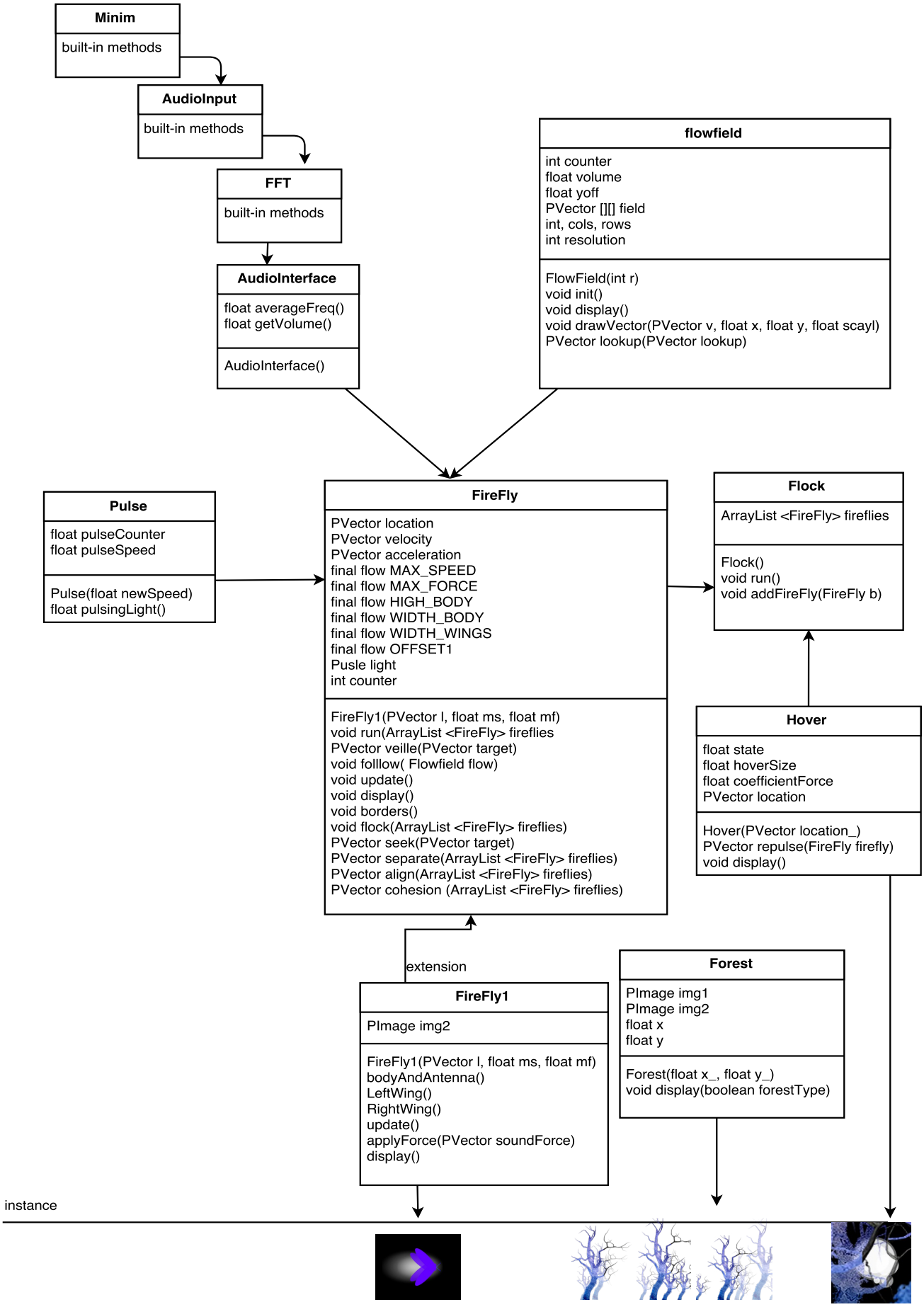
FINAL

flowfield flocking separate

video documentation: https://vimeo.com/163352438

UML


Minim
built-in methods
AudioInput
built-in methods
FFT
built-in methods
AudioInterface
float averageFreq()
float getVolume()
AudioInterface()
flowfield
int counter
float volume
float yoff
PVector [][] field
int, cols, rows
int resolution
FlowField(int r)
void init()
void display()
void drawVector(PVector v, float x, float y, float scayl)
PVector lookup(PVector lookup)
Pulse
float pulseCounter
float pulseSpeed
Pulse(float newSpeed)
float pulsingLight()
FireFly
PVector location
PVector velocity
PVector acceleration
final flow MAX_SPEED
final flow MAX_FORCE
final flow HIGH_BODY
final flow WIDTH_BODY
final flow WIDTH_WINGS
final flow OFFSET1
Pusle light
int counter
FireFly1(PVector l, float ms, float mf)
void run(ArrayList <FireFly> fireflies
PVector veille(PVector target)
void folllow(Flowfield flow)
void update()
void display()
void borders()
void flock(ArrayList <FireFly> fireflies)
PVector seek(PVector target)
PVector separate(ArrayList <FireFly> fireflies)
PVector align(ArrayList <FireFly> fireflies)
PVector cohesion (ArrayList <FireFly> fireflies)
Flock
ArrayList <FireFly> fireflies
Flock()
void run()
void addFireFly(FireFly b)
Hover
float state
float hoverSize
float coefficientForce
PVector location
Hover(PVector location_)
PVector repulse(FireFly firefly)
void display()
extension
FireFly1
PImage img2
FireFly1(PVector l, float ms, float mf)
bodyAndAntenna()
LeftWing()
RightWing()
update()
applyForce(PVector soundForce)
display()
Forest
PImage img1
PImage img2
float x
float y
Forest(float x_, float y_)
void display(boolean forestType)
instance