

Advanced Coding Tools and Methodologies

BIO MASHUP

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INTRODUCTION

- Goal of the project:

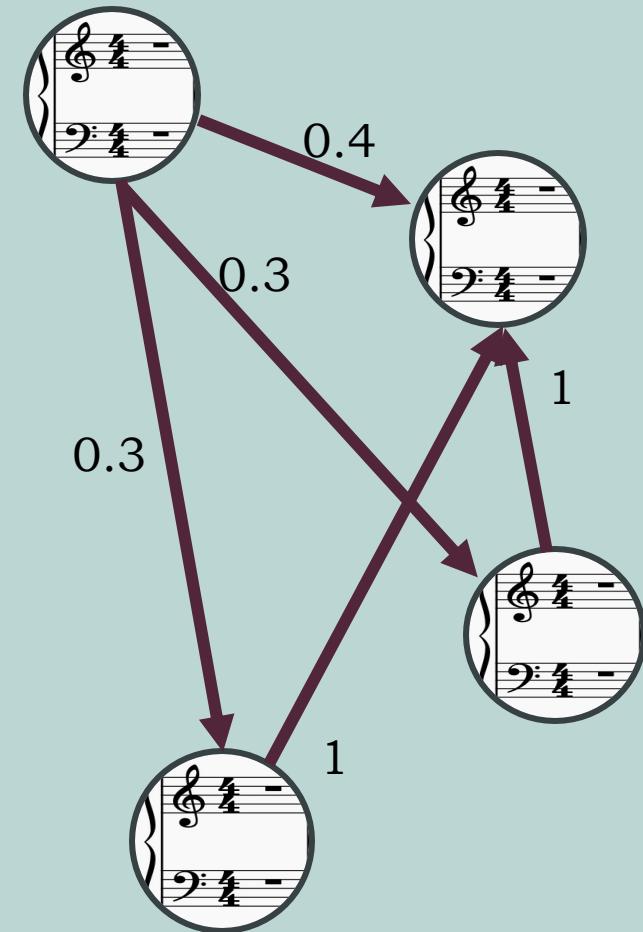
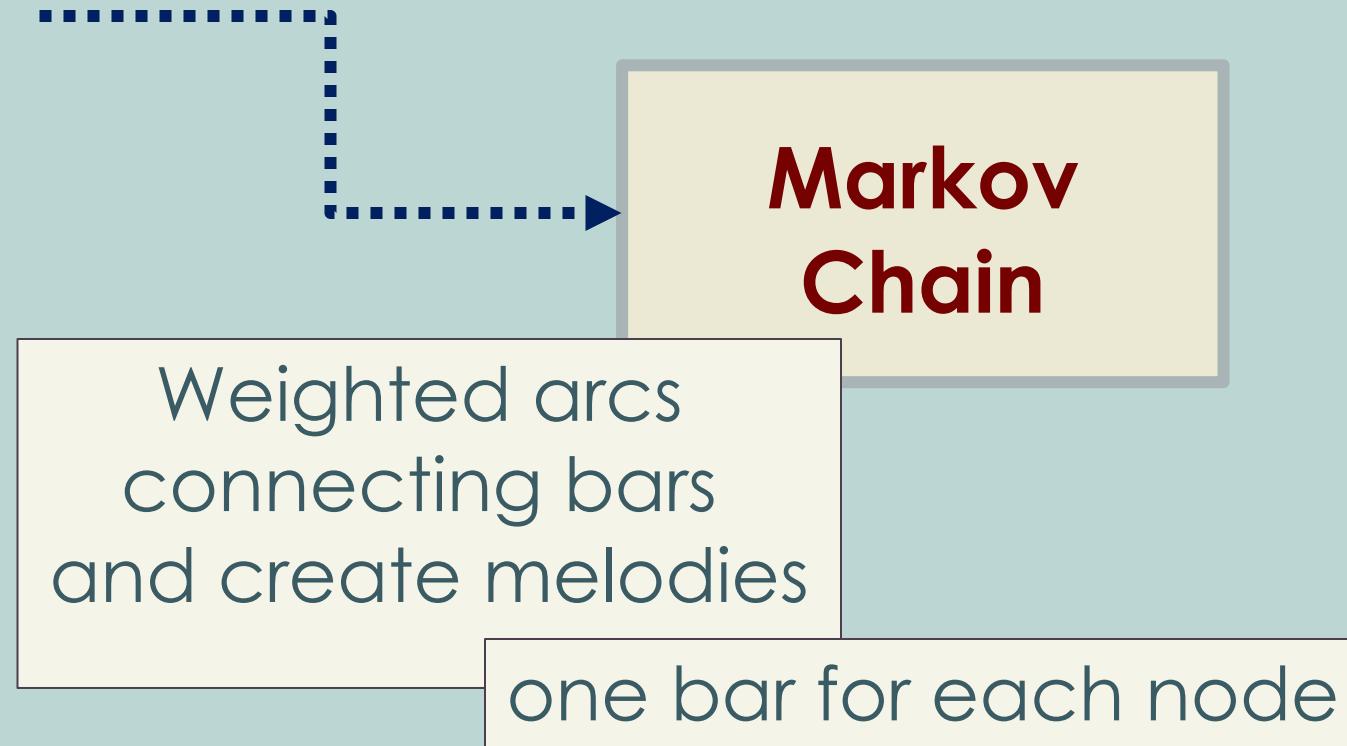
Creation of a self-generating music environment created by user interaction through the combination of different melodic and rhythmic music styles and different instruments.

combining different components the user can build a visual and musical environment.

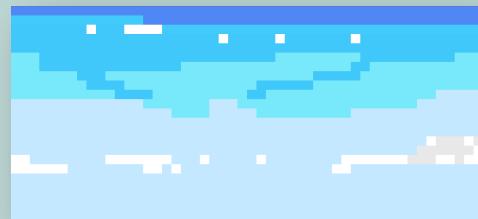
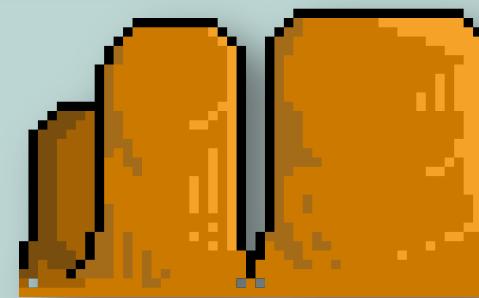
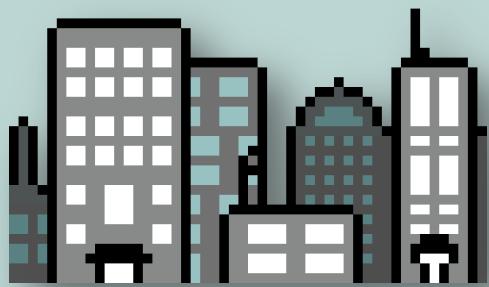
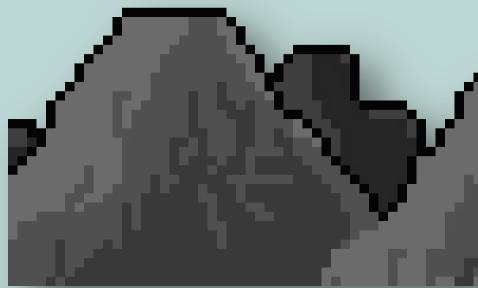


MUSIC GENERATION

Generative model



MUSIC GENERATION



4 ENVIRONMENTS



4 MARKOV CHAINS



4 MUSIC STYLES



AUDIO GENERATION

```
class Bell {
    constructor () {
        var synth = new Tone.DuoSynth()
        var dly = new Tone.FeedbackDelay()
        var verb = new Tone.Reverb()

        synth.set({
            voice0: {
                envelope: {
                    attack: 0,
                    attackCurve: 'linear',
                    decay: 1.241,
                    decayCurve: "exponential",
                    sustain: 0,
                    release: 1.89,
                },
            },
            voice1: {
                envelope: {
                    attack: 0,
                    attackCurve: 'linear',
                    decay: 1.241,
                    decayCurve: "exponential",
                    sustain: 0,
                    release: 1.89,
                },
            },
            harmonicity: 2,
            vibratoAmount: 0,
        });
    }

    // ...
    synth.voice0. oscillator.type = 'sine2'
    synth.voice1. oscillator.type = 'sine3'
    synth.voice1. volume.value = -20;
    synth.volume.value = -6

    dly.set({
        delayTime: '4n.',
        feedback: 0.3,
        wet: 0.08,
    })

    verb.set({
        decay: 4,
        // preDelay: 0.67,
        wet: 0.2,
    })

    synth.chain(dly, verb, Tone.Destination)
}

this.synth = synth;
```

1st attempt



Synthesis with
Tone.js



Use of Tone.js
as modular
synthesizer



Highly
inefficient



AUDIO GENERATION

```
class Bell {  
  
    constructor() {  
        var resolvePromise;  
        state.isLoadingInstr = new Promise(resolve => {  
            resolvePromise = resolve;  
        });  
        let initNote = BASE_MIDI_NOTES_NUM["C3"];  
        let numCycles = BASE_MIDI_NOTES_NUM["C6"] - initNote + 1;  
        let melUrls = {};  
  
        for (let i = 0; i < numCycles; i++) {  
            melUrls[initNote + i] = ENV1_BASE_URL + `/01_BellSamplesC3C6/Bell_${i + 1}.mp3`  
        };  
        var mel = new Tone.Players(melUrls, () => {  
            resolvePromise()  
            console.log("Bell loaded")  
       });  
        mel.volume.value = -9;  
        mel.toDestination();  
        this.mel = mel;  
    }  
}
```

2nd attempt



Sythesis with
DAW (Reaper)



Use of Tone.js
as sampler



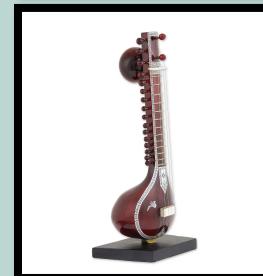
**A lot more
efficient**



MELODY INSTRUMENTS



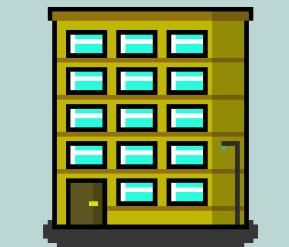
BELL



SITAR



MARIMBA



MOOG



BASS INSTRUMENTS

All basses are synthesized
with Reaper stock synth



Each environmental element
represents a different synth
bass



Mountain



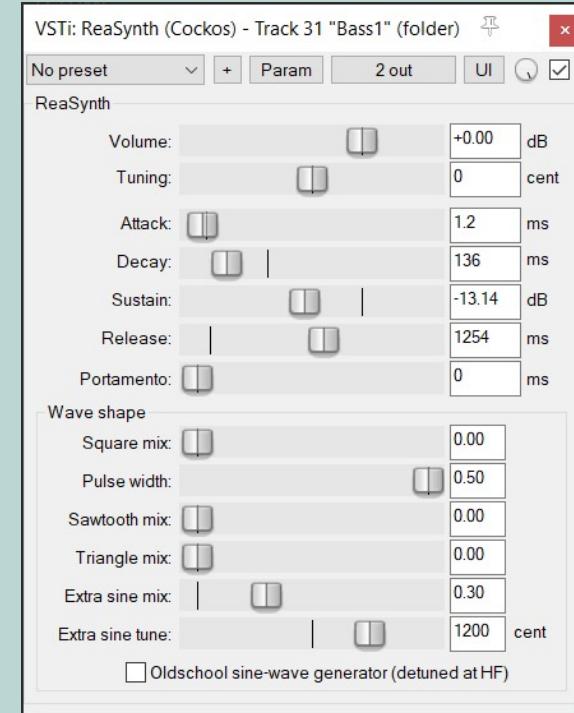
Desert



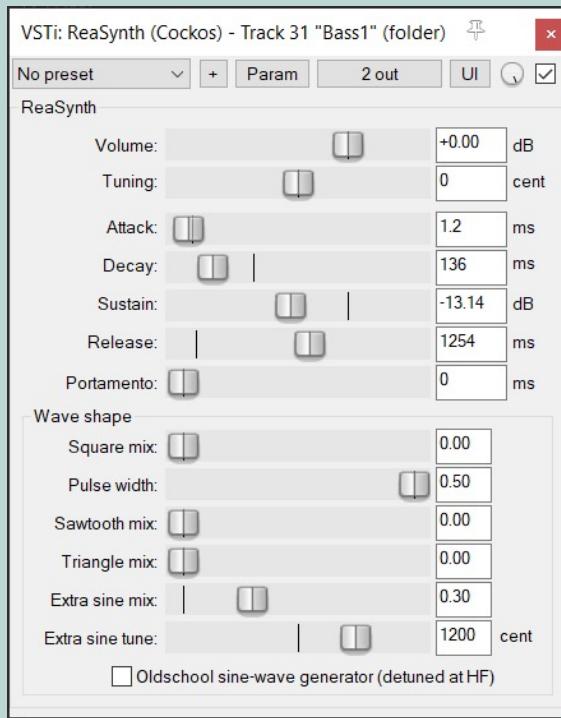
Seaside



City



ACCOMPANIMENT INSTRUMENTS



FLOOR = PAD

Also harmonic pads are synthesized with
Reaper stock synth.



Chorus

Delay

Reverb

Phaser

Filters

Tremolo



RHYTHMIC PATTERNS

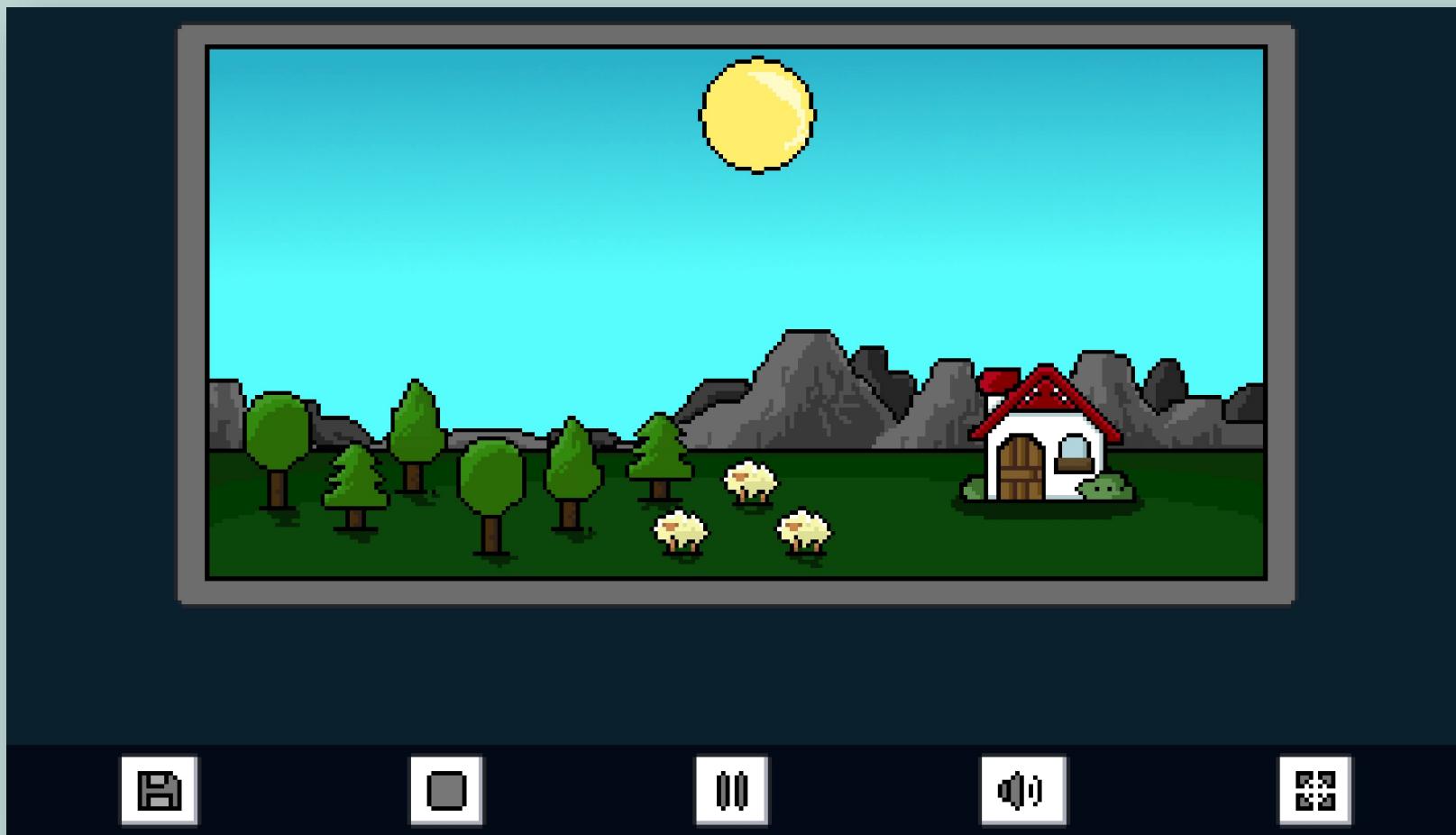
	1	2	3	
Kick				
Snare				
Shake				
Percuss				



USER INTERFACE

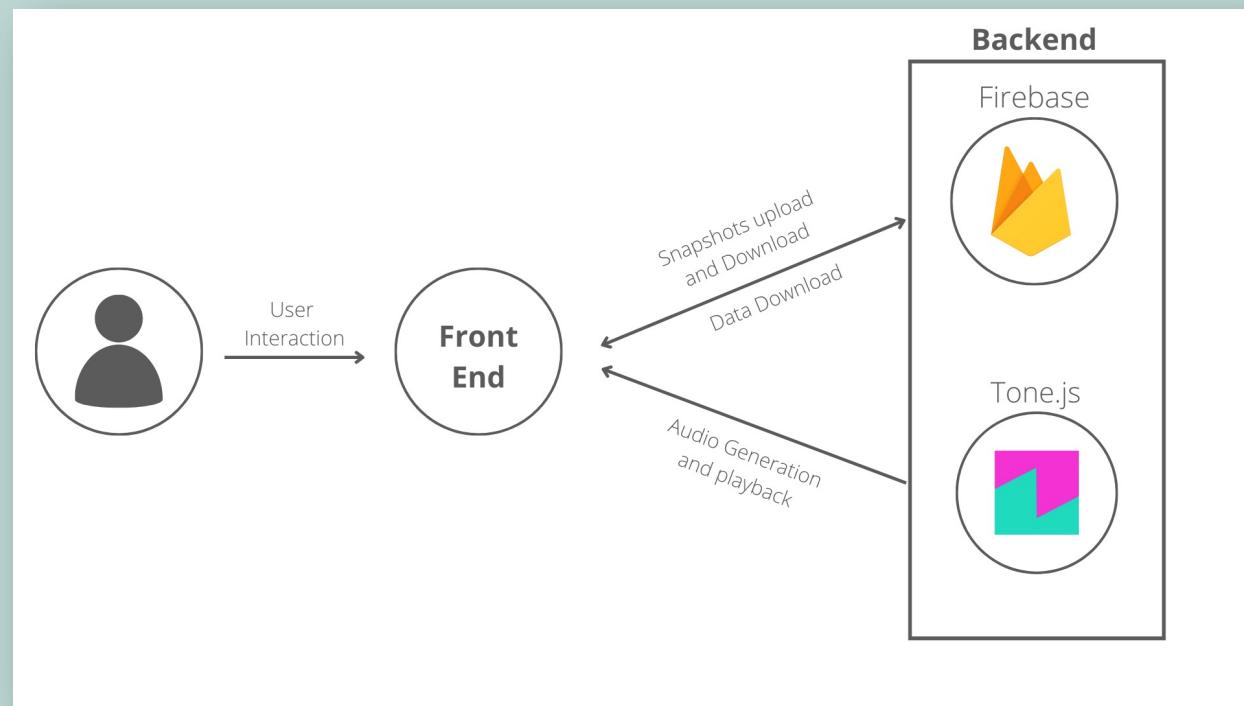


PLAYBACK INTERFACE



SYSTEM IMPLEMENTATION

- All the data visualized and generated by the system are stored on a database instance provided by Firebase



POSSIBLE IMPROVEMENTS

- More nodes in music generation
- Nodes everlast generated by A.I.
- User login for saving/personalizations
- Modular expansion
- Implementation of animated elements (trees, sea, animals, ...)



THANKS FOR THE ATTENTION



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MILANO 1863



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