Glove Effects

Code Used for Making Music with Arduino-Connected Flex Sensor Gloves (c) 2017

```
SerialPort.closeAll;

(
/*
SerialPort.closeAll;
SerialPort.devices;
s.quit;
*/

//initial setup
~port=SerialPort("/dev/tty.usbmodem1411", 9600);
~val = [];
~min = 615;
~max = 830;
~a_min = 592;
~b_min = 625;
~c_min = 630;
~a_max = 812;
~b_max = 813;
~c_max = 834;
d = Dictionary.new;
d.add(\a -> 0);
d.add(\b -> 0);
d.add(\c -> 0);

Tdef(\getdata,{
    loop{
        var ascii;
        ascii=~port.next;
        case
        {ascii==nil} {nil}
        {ascii.asAscii.isAlpha}
        {
            if(
                ~val.size>0,
                {
                    d[ascii.asAscii.asSymbol] = ~val.convertDigits;
                    ~val = [];
                }
            );
        }
        {ascii.asAscii.isDecDigit} {~val=~val.add(ascii.asAscii.digit)}
        {true}{nil};

        //d.postln;
        0.0001.wait;
    };

});

s.waitForBoot({
```

```
        ~spin3= Buffer.read(s,"/Users/Casey/Music/MusicGlove/Spin3.wav" );
        ~fmaj7= Buffer.read(s,"/Users/Casey/Music/MusicGlove/Fmaj7.aif" );
        ~whiddittwo= Buffer.read(s,"/Users/Casey/Music/MusicGlove/WhidditTwo.wav");
        ~groove= Buffer.read(s,"/Users/Casey/Music/MusicGlove/Groove.aif");
        ~main= Buffer.read(s, "/Users/Casey/Music/MusicGlove/Main.aiff");


        ~spin3M1= Buffer.readChannel(s,"/Users/Casey/Music/MusicGlove/Spin3.wav", channels:[0] );
        ~fmaj7M1= Buffer.readChannel(s,"/Users/Casey/Music/MusicGlove/Fmaj7.aif", channels:[0] );
        ~whiddittwoM1= Buffer.readChannel(s,"/Users/Casey/Music/MusicGlove/WhidditTwo.wav", channels
        ~grooveM1=Buffer.readChannel(s,"/Users/Casey/Music/MusicGlove/Groove.aif", channels:[0] );
        ~mainM1= Buffer.readChannel(s,"/Users/Casey/Music/MusicGlove/Main.aiff", channels:[0] );

//PLAYSOUND
    SynthDef.new(\playsound,{
        arg out=0, buf=0, density=1, cf=20000, rq=1, rate=1, graindur=1, amp=1,
        atk=5, rel=5, gate=1;
        var sig, env;
        sig = GrainBuf.ar(
            2,
            Dust.kr(density),
            graindur,
            buf,
            rate,
            LFNoise0.kr(500).range(0,1),
            2,
            0,
        );
        sig = RLPF.ar(sig, cf, rq);
        env = EnvGen.kr(Env.new([0,1,1,0],[atk,0.01,rel],[1,0,-1],2),gate,doneAction:2);
        sig = sig * env * amp;
        Out.ar(out,sig);
    }).add;


//FLANGER
    SynthDef.new(\flanger,{
        arg out=0, buf=0, density=10, decaytime=0.01, combfreq=500, amp=1,
        atk=5, rel=5, gate=1, rate=1, durmin=0.05, durmax=0.2, posmin=0, posmax=1;
        var sig, env;
        sig = GrainBuf.ar(
            2,
            Dust.kr(density),
            LFNoise0.kr(500).exprange(durmin,durmax),
            buf,
            rate,
            LFNoise0.kr(500).range(posmin,posmax),
            2,
            0,
        );
        sig = sig + CombL.ar(sig, 1, 1/(combfreq.lag(0.02)),decaytime);
        sig = LeakDC.ar(sig);
        sig = HPF.ar(sig, 10);
        sig = sig * 0.5;
        env = EnvGen.kr(Env.new([0,1,1,0],[atk,0.01,rel],[1,0,-1],2),gate,doneAction:2);
        sig = sig * env * amp;
```

```
                Out.ar(out,sig);
        }).add;

//JUST PLAY
        SynthDef.new(\justplay, {
            arg buf=0, rate=1, cf=18000, amp=0.5, gate=1;
            var sig, env;
            env = EnvGen.kr(Env.asr,gate,doneAction:2);
            sig = PlayBuf.ar(2,buf,rate.lag(0.1),loop:1);
            sig = LPF.ar(sig, cf.lag(0.2));
            sig = sig * env * amp.lag(0.1);
            Out.ar(0, sig);
        }).add;
});
)

//EVENT FUNCTIONS

(
//empty event dictionary
~events = Dictionary.new;

/*
four events for each sound:
(1) start the sound
(2) start controlling the sound w/ glove
(3) stop controlling sound w/ glove
(4) stop the sound (fade it out)
*/



//1 Spin Flanger
~events.add(\spinFlanger1 -> {
    ~spinFlangerSynth1 = Synth.new(
        \flanger,
        [
            \buf, ~spin3M1.bufnum,
            \density, 50,
            \atk, 0.1,
            \posmin,0.09,
            \posmax, 0.2,
            \amp, 1.5,
            \decay, 3,
        ]
    );
});
//2
~events.add(\spinFlanger1_startControl -> {
    Tdef(\spinFlanger1FX, {
        loop{
            ~spinFlangerSynth1.set(
                //\amp, d[\a].linexp(~a_min,~a_max,0.1,1),
                \decaytime, d[\b].linexp(~b_min,~b_max,8,0.03),
                \combfreq, [65,67,69,70,72,74,76,77].at(d[\c].linlin(~c_min,~c_max,0,7).round).m
            );
```

```
                0.05.wait;
            }
        }).play
});
//3
~events.add(\spinFlanger1_stopControl -> {Tdef(\spinFlanger1FX).stop});
//4
~events.add(\spinFlanger1_fade -> {~spinFlangerSynth1.set(\gate, 0)});

//1 FMAaj7 Flanger
~events.add(\fmaj7Flanger1 -> {
    ~fmaj7FlangerSynth1 = Synth.new(
        \flanger,
        [
            \buf, ~fmaj7M1.bufnum,
            \density, 4,
            \atk, 0.1,
            \durmin, 2,
            \durmax, 5,
            \posmin,0.09,
            \posmax, 0.2,
            \amp, 0.5,
            \decaytime, 0.01,
        ]
    );
});
//2
~events.add(\fmaj7Flanger1_startControl -> {
    Tdef(\fmaj7Flanger1FX, {
        loop{
            ~fmaj7FlangerSynth1.set(
                \amp, d[\a].linexp(~a_min,~a_max,0.05,1),
                \durmin, d[\b].linexp(~b_min,~b_max,0.01,0.75),
                \durmax, d[\b].linexp(~b_min,~b_max,0.04,1.25),
                \density, d[\b].linexp(~b_min,~b_max,150,16),
            );
            0.05.wait;
        }
    }).play
});
//3
~events.add(\fmaj7Flanger1_stopControl -> {Tdef(\fmaj7Flanger1FX).stop});
//4
~events.add(\fmaj7Flanger1_fade -> {~fmaj7FlangerSynth1.set(\gate, 0)});




//1 Whiddit Flanger
~events.add(\whidditFlanger1 -> {
    ~whidditFlangerSynth1 = Synth.new(
        \flanger,
        [
            \buf, ~whiddittwoM1.bufnum,
            \density, 50,
            \atk, 0.1,
```

```
                \posmin,0,
                \posmax, 1,
                \amp, 0.4,
            ]
        );
    });
    //2
    ~events.add(\whidditFlanger1_startControl -> {
        Tdef(\whidditFlanger1FX, {
            loop{
                ~whidditFlangerSynth1.set(
                    \amp, d[\a].linexp(~a_min,~a_max,0.05,0.45),
                    \decaytime, d[\c].linexp(~b_min,~b_max,10,3),
                    \combfreq, ([29,33,36,41,45,48,53,57,60,65,69,72]).at(d[\b].linlin(~c_min,~c_max
                );
                0.05.wait;
            }
        }).play
    });
    //3
    ~events.add(\whidditFlanger1_stopControl -> {Tdef(\whidditFlanger1FX).stop});
    //4
    ~events.add(\whidditFlanger1_fade -> {~whidditFlangerSynth1.set(\gate, 0)});


    //1
    ~events.add(\FMaj71 -> {
        ~fmaj7Synth1 = Synth.new(
            \justplay,
            [
                \amp, 0.5,
                \buf, ~fmaj7M1.bufnum,
                \rate, 1,
                \cf, 18000,
            ]
        );
    });


    //2
    ~events.add(\FMaj71_startControl -> {
        Tdef(\FMaj71FX, {
            loop{
                ~fmaj7Synth1.set(
                    \cf, d[\a].linexp(~b_min,~b_max, 300, 18000),
                    \amp, d[\c].linexp(~c_min,~c_max, 0.01, 0.5)
                );
                0.05.wait;
            }
        }).play
    });


    //3
    ~events.add(\FMaj71_stopControl -> {Tdef(\FMaj71FX).stop});


    //4
    ~events.add(\FMaj71_fade -> {~fmaj7Synth1.set(\gate, 0)});
```

```
//1 Groove Flanger
~events.add(\grooveFlanger1 -> {
    ~grooveFlangerSynth1 = Synth.new(
        \flanger,
        [
            \buf, ~grooveM1.bufnum,
            \density, 50,
            \atk, 4,
            \posmin,0.11,
            \posmax, 0.18,
            \amp, 1,
            \durmin, 0.1,
            \durmax, 0.2,
            \rate, 1,
        ]
    );
});
//2
~events.add(\grooveFlanger1_startControl -> {
    Tdef(\grooveFlanger1FX, {
        loop{
            ~grooveFlangerSynth1.set(
                \amp, d[\c].linexp(~c_min,~c_max,0.1,1),
                \rate, [-5,-3,-2,0,2,4,5].at(d[\a].linlin(~a_min,~a_max,0,6).round).midiratio,
            );
            0.05.wait;
        }
    }).play
});

//3
~events.add(\grooveFlanger1_stopControl -> {Tdef(\grooveFlanger1FX).stop});
//4
~events.add(\grooveFlanger1_fade -> {~grooveFlangerSynth1.set(\gate, 0)});

//1
~events.add(\mainFlanger1 -> {
    ~mainFlangerSynth1 = Synth.new(
        \flanger,
        [
            \buf, ~mainM1.bufnum,
            \density, 50,
            \atk, 0.1,
            \posmin,0.09,
            \posmax, 0.2
        ]
    );
});
//2
~events.add(\mainFlanger1_startControl -> {
    Tdef(\mainFlanger1FX, {
        loop{
            ~mainFlangerSynth1.set(
                \amp, d[\a].linexp(~a_min,~a_max,0.1,8),
```

```
                    \decaytime, d[\b].linexp(~b_min,~b_max,10,0.03),
                    \rate, d[\c].linlin(~a_min,~a_max,-1,1),
                );
                0.05.wait;
            }
        }).play
});
//3
~events.add(\mainFlanger1_stopControl -> {Tdef(\mainFlanger1FX).stop});
//4
~events.add(\mainFlanger1_fade -> {~mainFlangerSynth1.set(\gate, 0)});




//1
~events.add(\main1 -> {
    ~mainSynth1 = Synth.new(
        \justplay,
        [
            \amp, 0.5,
            \buf, ~main.bufnum,
            \rate, 1,
            \cf, 18000,
        ]
    );
});

//2
~events.add(\main1_startControl -> {
    Tdef(\main1FX, {
        loop{
            ~mainSynth1.set(
                \cf, d[\a].linexp(~b_min,~b_max, 300, 18000),
                \amp, d[\c].linexp(~c_min,~c_max, 0.05, 0.5)
            );
            0.05.wait;
        }
    }).play
});

//3
~events.add(\main1_stopControl -> {Tdef(\main1FX).stop});

//4
~events.add(\main1_fade -> {~mainSynth1.set(\gate, 0)});

//1
~events.add(\event1 -> {
    ~event1Synth1 = Synth.new(
        \flanger,
        [
            \buf, ~whiddittwoM1.bufnum,
            \density, 50,
            \atk, 0.4,
```

```
                        \posmin,0,
                        \posmax, 1,
                        \amp, 0.4,
                    ]
            );
    });
    //2
    ~events.add(\event1_startControl -> {
        Tdef(\event1FX, {
            loop{
                ~event1Synth1.set(
                    //\amp, d[\a].linexp(~a_min,~a_max,0.01,0.45),
                    \decaytime, d[\c].linexp(~b_min,~b_max,10,3),
                    \cf, d[\c].linexp(~b_min,~b_max, 300, 18000),
                    \combfreq, ([27,30,32,34,37,39,41]+24).at(d[\a].linlin(~c_min,~c_max,0,6).round)
                );
                0.05.wait;
            }
        }).play
    });
    //3
    ~events.add(\event1_stopControl -> {Tdef(\event1FX).stop});
    //4
    ~events.add(\event1_fade -> {~event1Synth1.set(\gate, 0)});

    //1
    ~events.add(\event2 -> {
        ~event2Synth1 = Synth.new(
            \flanger,
            [
                \buf, ~whiddittwoM1.bufnum,
                \density, 50,
                \atk, 0.4,
                \posmin,0,
                \posmax, 1,
                \amp, 0.4,
            ]
        );
    });
    //2
    ~events.add(\event2_startControl -> {
        Tdef(\event2FX, {
            loop{
                ~event2Synth1.set(
                    //\amp, d[\a].linexp(~a_min,~a_max,0.01,0.45),
                    \decaytime, d[\a].linexp(~b_min,~b_max,10,3),
                    \cf, d[\a].linexp(~b_min,~b_max, 300, 18000),
                    \combfreq, ([27,30,34,36,37,42,44]+24).at(d[\c].linlin(~c_min,~c_max,0,6).round)
                );
                0.05.wait;
            }
        }).play
    });
    //3
    ~events.add(\event2_stopControl -> {Tdef(\event2FX).stop});
    //4
```

```
~events.add(\event2_fade -> {~event2Synth1.set(\gate, 0)});

//1
~events.add(\event3 -> {
    ~event3Synth1 = Synth.new(
        \flanger,
        [
            \buf, ~whiddittwoM1.bufnum,
            \density, 50,
            \atk, 0.4,
            \posmin,0,
            \posmax, 1,
            \amp, 0.4,
        ]
    );
});
//2
~events.add(\event3_startControl -> {
    Tdef(\event3FX, {
        loop{
            ~event3Synth1.set(
                //\amp, d[\a].linexp(~a_min,~a_max,0.01,0.45),
                \decaytime, d[\a].linexp(~b_min,~b_max,10,3),
                \cf, d[\a].linexp(~b_min,~b_max, 300, 18000),
                \combfreq, ([27,30,32,34,37,39,41]).at(d[\b].linlin(~c_min,~c_max,0,6).round).mi
            );
            0.05.wait;
        }
    }).play
});
//3
~events.add(\event3_stopControl -> {Tdef(\event3FX).stop});
//4
~events.add(\event3_fade -> {~event3Synth1.set(\gate, 0)});


Window.closeAll;
w = Window.new("Sensor Glove Controls", Rect(50,200,1200,400)).front;

~hello = StaticText(w, Rect(5,65,100,40))
.string_("sound:")
.align_(\center);

StaticText(w, Rect(5,115,100,40))
.string_("controls:")
.align_(\center);



StaticText(w, Rect(300,20,80,40))
.string_("spinFlanger")
.align_(\center);



Button.new(w,Rect(300,60,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
```

```
        [\on, Color.white, Color.green(0.8)]
])
.font_(Font(Font.defaultSansFace, 24))
.canFocus_(false)
.action_({
    arg btn;
    if( btn.value == 1,
        {~events[\spinFlanger1].value},
        {~events[\spinFlanger1_fade].value}
    );
});


Button.new(w,Rect(300,120,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
    [\on, Color.white, Color.new(0,0.5,1)]
])
.font_(Font(Font.defaultSansFace, 24))
.canFocus_(false)
.action_({
    arg btn;
    if( btn.value == 1,
        {~events[\spinFlanger1_startControl].value},
        {~events[\spinFlanger1_stopControl].value}
    );
});


StaticText(w, Rect(500,20,80,40))
.string_("Whiddit")
.align_(\center);


Button.new(w,Rect(500,60,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
    [\on, Color.white, Color.green(0.8)]
])
.font_(Font(Font.defaultSansFace, 24))
.canFocus_(false)
.action_({
    arg btn;
    if( btn.value == 1,
        {~events[\whidditFlanger1].value},
        {~events[\whidditFlanger1_fade].value}
    );
});


Button.new(w,Rect(500,120,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
    [\on, Color.white, Color.new(0,0.5,1)]
])
.font_(Font(Font.defaultSansFace, 24))
```

```
    .canFocus_(false)
    .action_({
        arg btn;
        if( btn.value == 1,
            {~events[\whidditFlanger1_startControl].value},
            {~events[\whidditFlanger1_stopControl].value}
        );
    });




StaticText(w, Rect(800,20,80,40))
.string_("Main")
.align_(\center);


Button.new(w,Rect(800,60,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
    [\on, Color.white, Color.green(0.8)]
])
.font_(Font(Font.defaultSansFace, 24))
.canFocus_(false)
.action_({
    arg btn;
    if( btn.value == 1,
        {~events[\main1].value},
        {~events[\main1_fade].value}
    );
});

Button.new(w,Rect(800,120,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
    [\on, Color.white, Color.new(0,0.5,1)]
])
.font_(Font(Font.defaultSansFace, 24))
.canFocus_(false)
.action_({
    arg btn;
    if( btn.value == 1,
        {~events[\main1_startControl].value},
        {~events[\main1_stopControl].value}
    );
});


StaticText(w, Rect(1000,20,80,40))
.string_("Main F")
.align_(\center);


Button.new(w,Rect(1000,60,80,40))
.states_([
    [\off, Color.gray(0.3), Color.gray(0.8)],
    [\on, Color.white, Color.green(0.8)]
```

```
	])
	.font_(Font(Font.defaultSansFace, 24))
	.canFocus_(false)
	.action_({
		arg btn;
		if( btn.value == 1,
			{~events[\mainFlanger1].value},
			{~events[\mainFlanger1_fade].value}
		);
	});


	Button.new(w,Rect(1000,120,80,40))
	.states_([
		[\off, Color.gray(0.3), Color.gray(0.8)],
		[\on, Color.white, Color.new(0,0.5,1)]
	])
	.font_(Font(Font.defaultSansFace, 24))
	.canFocus_(false)
	.action_({
		arg btn;
		if( btn.value == 1,
			{~events[\mainFlanger1_startControl].value},
			{~events[\mainFlanger1_stopControl].value}
		);
	});


	//automatically start collecting sensor data in Dictionary d as soon as GUI window is built
	Tdef(\getdata).play;
)


//test lines
d[\c]
d[\b]
d[\a]


//loop test
{PlayBuf.ar(2, ~groove, loop:1)}.play

//manual test functions

//Spin Flanger
~events[\spinFlanger1].value;
~events[\spinFlanger1_startControl].value;
~events[\spinFlanger1_stopControl].value;
~events[\spinFlanger1_fade].value;

//Whiddit Flanger
~events[\whidditFlanger1].value;
~events[\whidditFlanger1_startControl].value;
~events[\whidditFlanger1_stopControl].value;
~events[\whidditFlanger1_fade].value;
```

```
//Main Flanger
~events[\mainFlanger1].value;
~events[\mainFlanger1_startControl].value;
~events[\mainFlanger1_stopControl].value;
~events[\mainFlanger1_fade].value;


//Print Values
x = {{d[\a].postln;0.07.wait;}.loop}.fork;
x = {{d[\b].postln;0.07.wait;}.loop}.fork;
x = {{d[\c].postln;0.07.wait;}.loop}.fork;
x.stop;
```