

MRuby-Zest - A new GUI toolkit for audio programs

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Zyn-Fusion



Another GUI Toolkit? Why?

Another GUI Toolkit? Why?

- ▶ Qt
- ▶ GTK
- ▶ AVTK
- ▶ roltk
- ▶ DPF
- ▶ JUCE
- ▶ fltk

Challenges

Toolkit's:

- ▶ Maturity
- ▶ Suitability for use in plugins
- ▶ Development speed

Zyn Timeline

- ▶ \approx 3 months of time
- ▶ \approx 30 views to implement

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- ▶ \approx 3 months of time
- ▶ \approx 30 views to implement
- ▶ Not a lot of time

Zyn Timeline

- ▶ I'm bad at GUI Programming

Zyn Timeline

- ▶ I'm bad at GUI Programming
- ▶ (and I hope I'm not alone)

Zyn Timeline

- ▶ Target DRY
- ▶ Target fast feedback loop
- ▶ Target long term maintainability

Zyn Timeline

New framework is a reasonable investment

- ▶ From scratch look and feel
- ▶ Take advantage of Zyn metadata model
- ▶ Provide something that can be enhanced long term

Borrowing Ideas

- ▶ Qt's QML
- ▶ QML's built in hotloading
- ▶ rtosc's metadata system

Qt's QML

Provides easy way to:

- ▶ Build widget trees
- ▶ Define custom behavior for edge cases
- ▶ Constrain how you expect widgets to be extended

Qt's QML

- ▶ QML's organization is great, but javascript is not-fun
- ▶ Provides a means for organizing widgets
- ▶ Makes widget extension easy

MRuby - Not Just Ruby



QML before - a parsing standpoint

```
MouseArea {  
    id: ma  
    property var styleData  
  
    anchors.fill: parent  
    onPressed: {  
        //javascript  
        parent.currentRow = styleData.row  
        parent.selection.select(styleData.row)  
    }  
    onClicked: {  
        //javascript  
        console.log(styleData.value)  
    }  
}
```


QML after - a parsing standpoint

```
MouseArea {  
    id: ma  
    property var styleData  
  
    anchors.fill: parent  
    onPressed: lambda {  
        #Ruby  
        parent.currentRow = styleData.row  
        parent.selection.select styleData.row  
    }  
    onClicked: lambda {  
        #Ruby  
        puts styleData.value.inspect  
    }  
}
```

So What is MRuby-Zest

- ▶ Uses QML's syntax in a MRuby environment
- ▶ Builds off of rtosc's exported metadata for quick dev

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- ▶ Uses QML's syntax in a MRuby environment
- ▶ Builds off of rtosc's exported metadata for quick dev
- ▶ $\approx 1,000$ commits so far
- ▶ ≈ 15 kloc of QML (widgets)
- ▶ ≈ 6 kloc ruby
- ▶ ≈ 7 kloc C

Components of the toolkit

- ▶ mruby-qml-parse
- ▶ mruby-qml-spawn

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- ▶ mruby-qml-spawn
- ▶ mruby-zest
- ▶ osc-bridge
- ▶ mruby-widget-lib

OSC bridge

```
{
  "path"      : "/part[0,15]/kit[0,15]/padpars/GlobalFilter/basefreq",
  "shortname": "cutoff",
  "name"      : "basefreq",
  "tooltip"   : "Base cutoff frequency",
  "units"     : "Hz",
  "scale"     : "logarithmic",
  "type"      : "f",
  "range"     : [31.25,32000]
},
{
  "path"      : "/part[0,15]/kit[0,15]/padpars/GlobalFilter/freqtracking",
  "shortname": "f.track",
  "name"      : "freqtracking",
  "tooltip"   : "Frequency Tracking amount",
  "units"     : "%",
  "scale"     : "linear",
  "type"      : "f",
  "range"     : [-100,100],
  "default"   : "0.0f"
},
```


QML Loading

- ▶ Class definitions
- ▶ Property definitions
- ▶ Method definitions
- ▶ Class instance specialization**

QML Loading - Live or at build

- ▶ Classes can be parsed and turned into .rb at build
- ▶ .qml files can be reloaded and re-instantiated at runtime

Hotloading - setup

```
Knob {  
  function draw(vg) {  
    active_color = :blue  
  
    draw_outline()  
    draw_xxx()  
    ...  
    ...  
    ...  
    ...  
  }  
}
```



Hotloading - making changes

```
Knob {  
  function draw(vg) {  
    active_color = :red  
  
    draw_outline()  
    draw_xxx()  
    ...  
    ...  
    ...  
    ...  
  }  
}
```



Hotloading - update on saving

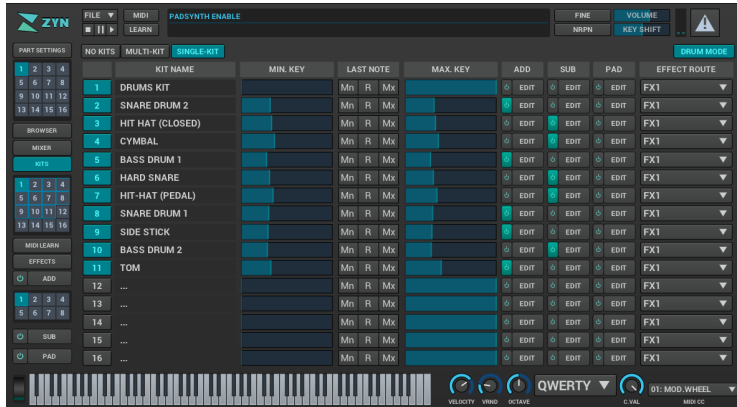
```
Knob {  
  function draw(vg) {  
    active_color = :red  
  
    draw_outline()  
    draw_xxx()  
    ...  
    ...  
    ...  
    ...  
  }  
}
```



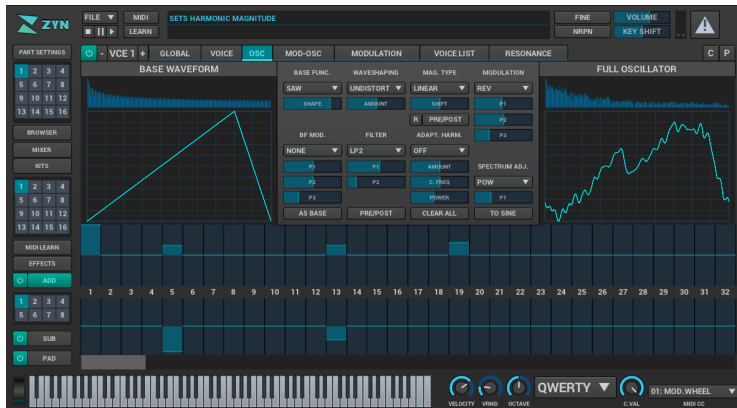
Widgets



Widgets, Widgets



Widgets, Widgets, Widgets



Even more widgets



Future Work

- ▶ Translations
- ▶ More data visualizations
- ▶ Animations
- ▶ Automated Screenshot collection
- ▶ Exploiting the scripting capabilities more
- ▶ Separation from Zyn

Conclusions

- ▶ MRuby-Zest powers Zyn-Fusion
- ▶ Adds hotloading and scripting to the plugin level UI design
- ▶ Builds off existing tools for streamlined dev
- ▶ It's new and ready to adapt

Questions?

- ▶ <https://github.com/mruby-zest/>