

Forth Haiku

Saturday November 19, 2011

Motivation

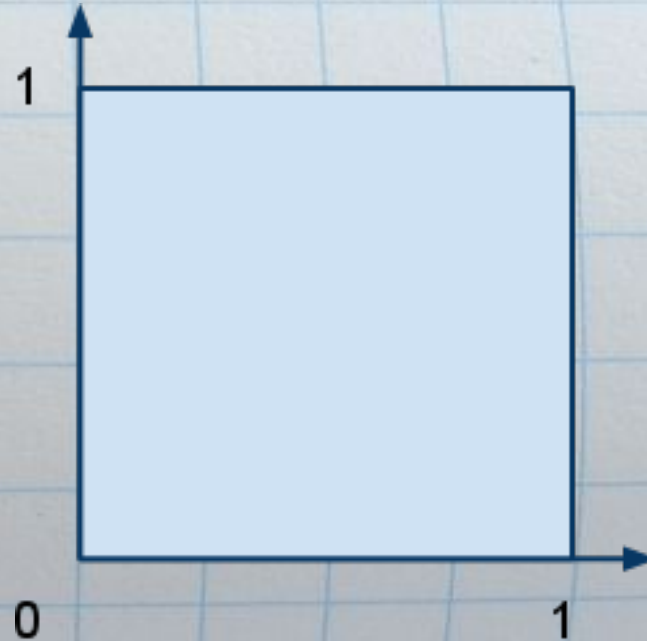
- Brevity is the soul of wit
- Constraints improve art
 - diatonic / pentatonic scales instead of chromatic
 - chromatic instead of arbitrary pitch
 - mosaics
 - pixel art
 - complementary colors
- Terse equations can yield complex images
 - Fractals
 - Mandelbrot set
 - Perlin Noise

Haiku

- 17 mora (~ syllables) in phrases or 5, 7, 5
- Reference a season
- Contains a kireji (unique Japanese part of speech)

Forth Haiku

- $F(x, y) \rightarrow (r, g, b)$ for x, y in $[0, 1]$
- Specified in simple Forth dialect with floating-point cells
- Limited vocabulary (44 words)
- 3 stanzas (red, green, blue)
- Deterministic and scalable
- Similar to a texture shader



Haiku Vocabulary

x y t

push pop dup over 2dup drop swap

= <> < > <= >=

and or not min max

+ - * / mod pow atan2 negate

sin cos tan log exp sqrt floor ceil abs

pi z+ z* random

:: ;

Example 1 : Solid color

1 0.7 0.3



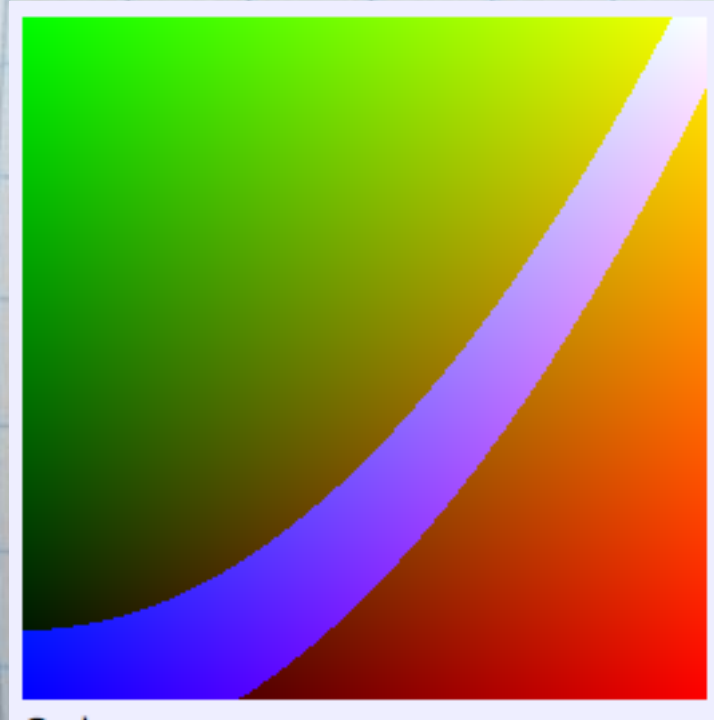
Example 2 : Gradient

x 0 0



Example 3 : Parabola

: t^2 dup * y - abs 0.1 < ;
x y x t^2



Forth Haiku WebApp

- forthsalon.appspot.com
- Anyone can post Haiku
- Everyone votes to select pretty ones
- AppEngine + Python (datastorage)
- Forth -> Javascript [-> WebGL]

JScript + Canvas

x 0 0

->

```
var go = function(xpos, ypos) { var time_val=0.0; var work1,  
work2, work3, work4;  
var temp3 = xpos;  
var temp2 = 0.0;  
var temp1 = 0.0;  
return [temp3, temp2, temp1, 1.0]; }; go
```

WebGL

```
precision highp float;
varying vec2 tpos;
uniform float time_val;
void main(void) {
float work1, work2, work3, work4, seed;
float temp3 = tpos.x;
float temp2 = 0.0;
float temp1 = 0.0;
gl_FragColor = vec4(temp3, temp2, temp1, 1.0); gl_FragColor.
a = min(max(0.0, gl_FragColor.a), 1.0); gl_FragColor.r *=
gl_FragColor.a; gl_FragColor.g *= gl_FragColor.a;
gl_FragColor.b *= gl_FragColor.a; }
```


Embellishments

- Animation
 - introduce t (seconds since midnight local-time)
- Alpha
 - optional 4th component returned
 - great for icons
- Audio
 - tried raw audio - was hard and cacophonous
 - pentatonic fed from image samples

Haiku Exhibition Questions?