FrameBuffer size의 황금 비율

Jeseon Lee

1 Motivation

- **setFramebufferScale**

script2.lua > initialize

```lua

function initialize(scene)

    local snapshot = KuruSnapshotNode.create()
    scene:addNodeAndRelease(snapshot)
    snapshot:setFramebufferScale(0.5, 0.5)

end
```

1 Motivation

```
master/110883_india_realtime_script_distort/realtime04/script.lua:  node:setFrameBufferScale(0.5, 0.5)
master/206878_improve_depth_normal/script_hsg/index.lua:  g_frameBufferNode:setFrameBufferScale(0.5, 0.5)
master/208913_3sec_magazine_cover/liner_do/script.lua:  node:setFrameBufferScale(0.5, 0.5)
master/314028_trigger_particle/script/index.lua:  node:setFrameBufferScale(0.5, 0.5)
master/314427_pink_purple_kira/script.3zip/script.lua:  blurSnapshot:setFrameBufferScale(0.5, 0.5)
master/314762_glitch_realtimetext/time/script.lua:  node:setFrameBufferScale(0.5, 0.5)
master/315094_vhs_realtime_glitch/date/script.lua:  node:setFrameBufferScale(0.5, 0.5)
master/315929_zoom_in_out_frame/preview/script.lua:  snapshot3D:setFrameBufferScale(0.5, 0.5)
```

1 Motivation

- **SetFrameBufferScale => 메모리 사용량 절약**

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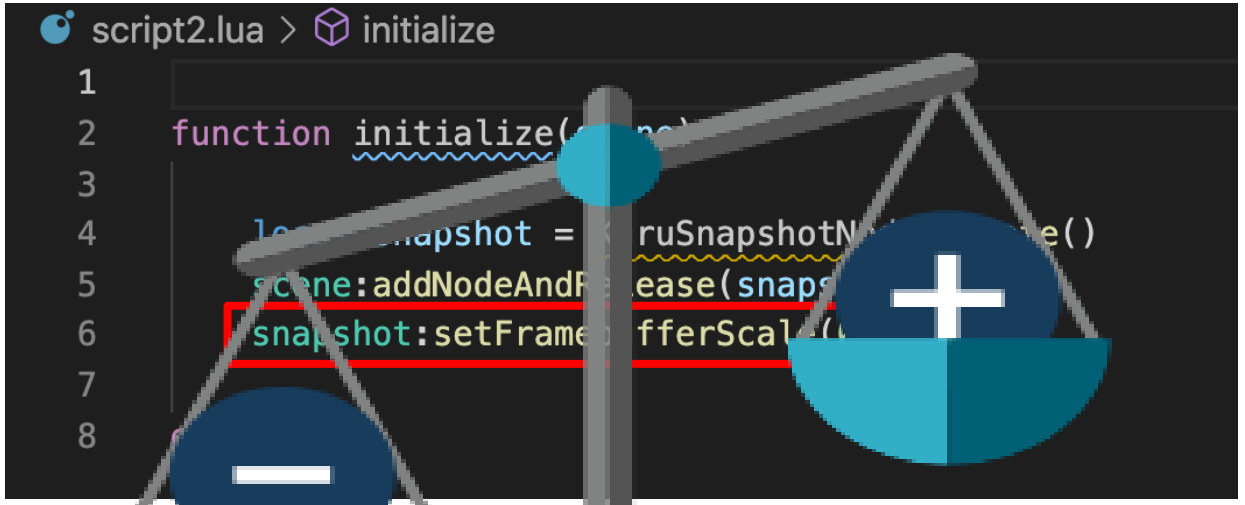
```

1 Motivation

- **메모리 사용량 vs 이미지 품질**




```
master/110883_india_realtim        ort/rea  ime04/script.lua:  node:setFrameBufferScale(0.5, 0.5)
master/206878_improve_depth_n      ipt_hsg/i  ex.lua:  g_frameBufferNode:setFrameBufferScale(0.5, 0.5)
master/208913_3sec_magazine_cover/liner_do/scri  .lua:  node:setFrameBufferScale(0.5, 0.5)
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master/314762_glitch_realtimetext/tim            tFrameBufferScale(0.5, 0.5)
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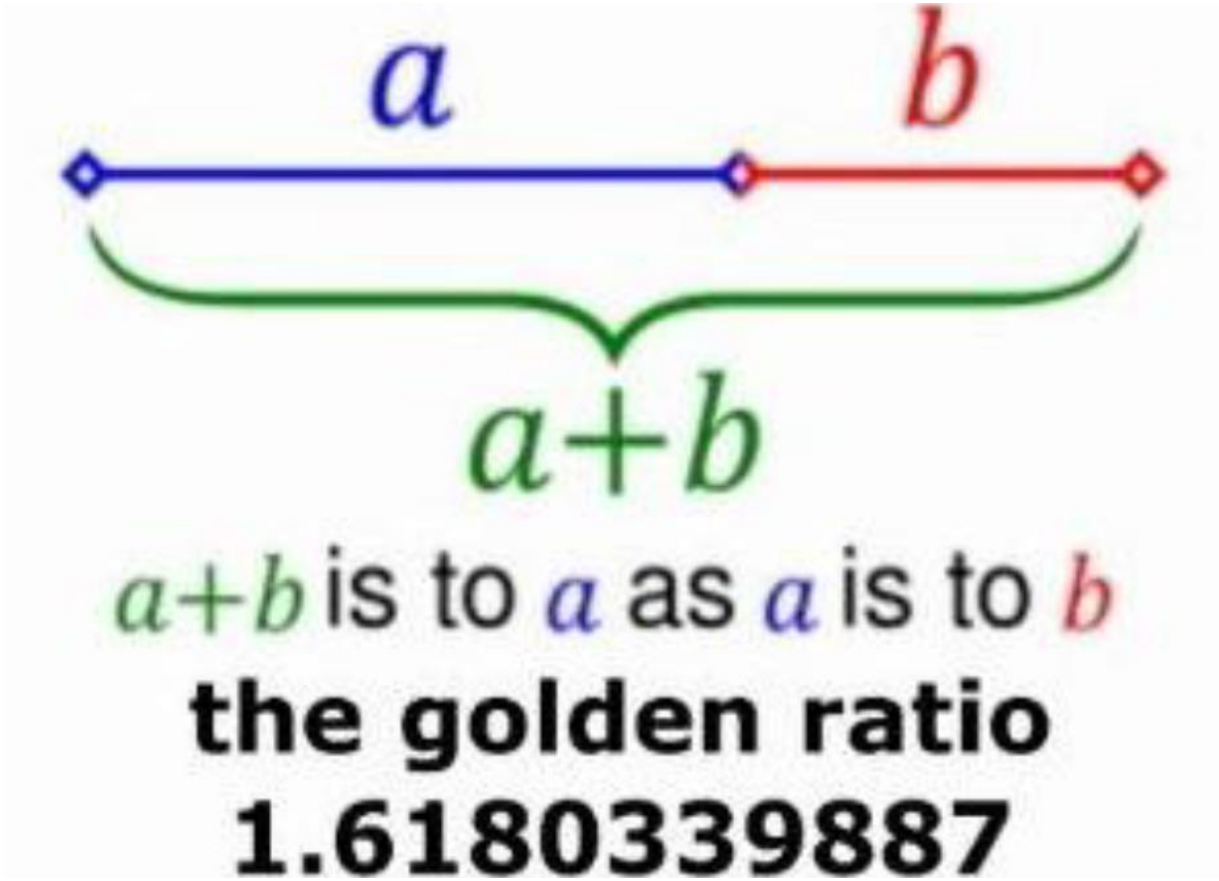
1 Motivation

- **메모리 사용량 VS 이미지 품질**
- => 황금 비율을 찾자!



2 메모리 사용량

2 메모리 사용량

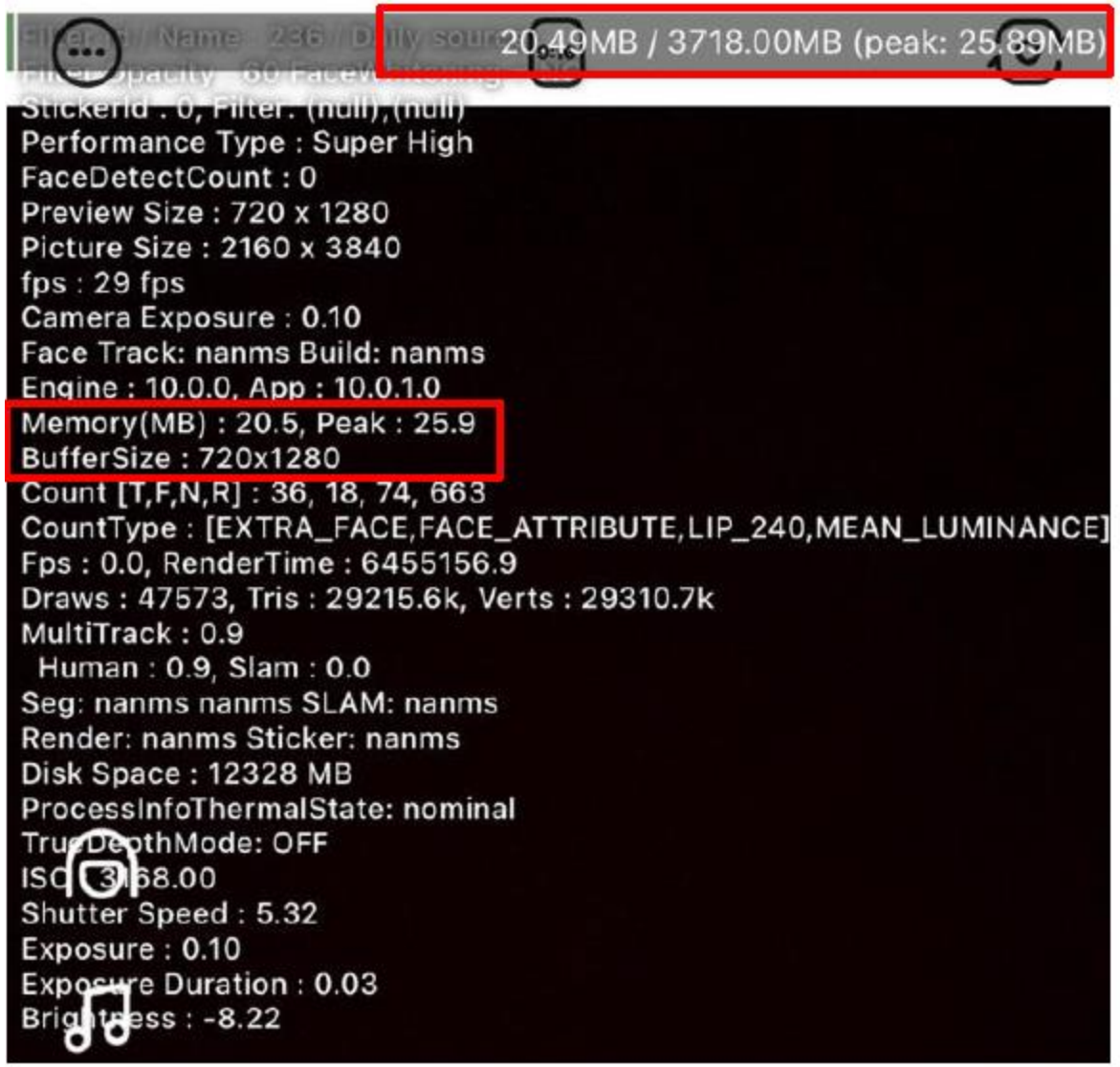
- **측정 방법**
  - Script 설정
    - FrameBuffer(Snapshot) 생성
    - Buffer Scale 조정
    - Rendering

```
1   require "KuruNodeKit/KuruNodeKit.lua"
2   /Users/lee/CreatorsStudio/Local/Working/
3   untitled/frambuffer_test • Contains emphasized
    items
4       local snapshot = KuruSnapshotNode.create()
5       scene:addNodeAndRelease(snapshot)
6       snapshot:setFrameBufferScale(0.0625, 0.0625)
7
8       local Frag = KuruNodeKit.createFragmentShaderNode("print.frag")
9       Frag:setChannel0(snapshot:getSampler())
10      scene:addNodeAndRelease(Frag)
11  end
```

2 메모리 사용량

- **측정 방법**
- SNOW App(beta)
  - Aspect ratio: 9:16
  - Buffer size: 720x1280

- 기본 메모리 사용량: 20 mb
- 프레임버퍼 생성:
  - 720 x 1280 x 32 bit = 3.5156 mb



2 메모리 사용량

- **메모리 사용량 측정 결과**
  - Scale은 가로, 세로 ½ 씩 감소

SCALE	메모리 사용량	메모리 감소 비율
1.0	3.5 mb	
0.5	0.9 mb	74.28 % 감소
0.25	0.2 mb	94.28 % 감소
0.125	0.1 mb	97.14 % 감소
0.0625	0.0.. mb	99.xx % 감소

3 이미지 품질

3 이미지 품질

- **측정 방법**
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3 이미지 품질

- **측정 방법**

3 이미지 품질

- **측정 방법**

3 이미지 품질

- **이미지 품질 측정 도구: SSIM(structural similarity index measure)**
  - SSIM 평가 요소
    - 밝기(brightness)
    - 대비(Contrast)
    - 이미지 구조(structure of images)

    - => 1.0 근접할 수록 "구조적 유사 지수"가 높음

SSIM 0.7380

SSIM 0.8646

Wang, Z., "Image quality assessment: from error visibility to structural similarity." IEEE transactions on image processing 13.4 600-612, 2004.

3 이미지 품질

- **이미지 품질 측정 결과(SSIM)**

3 이미지 품질

- **이미지 품질 측정 결과(SSIM)**

SCALE	이미지 품질 지수	메모리 감소 비율
1.0	-	
0.5	0.981	1.9 % 감소
0.25	0.957	4.3 % 감소
0.125	0.909	9.1 % 감소
0.0625	0.848	15.2 % 감소

4 결론

4 결론

- **•황금 비율: 0.25 scale**
  - [1] 0.25 scale -> [2] 0.125 scale -> [3] 0.0625 scale -> [4] 0.5 scale

SCALE	메모리 사용량(mb)	이미지 품질 지수	
1.0	3.5 mb	-	
0.5	0.9 (+ **74.28 %**)	0.981 (- **1.9 %**)	[4] 72.38
0.25	0.2 (+ **94.28 %**)	0.957 (- **4.3 %**)	[1] 89.98
0.125	0.1 (+ **97.14 %**)	0.909 (- **9.1 %**)	[2] 88.04
0.0625	0.0.. (+ **99.xx %**)	0.848 (- **15.2 %**)	[3] 83.8


TO BE
CONTINUED

2탄 예고

- **Perspective Division(원근 분할)**
  - 왜 해줘야 하는지
  - 어떤 경우에 해줘야 하는지