Optimized

April 20, 2020

1 Optimized Code

```
[1]: import d3dshot
     import torch
     import time
     import numpy as np
     %matplotlib inline
     import matplotlib.pyplot as plt
     import torch.nn.functional as F
```

```
[59]: def down_up_sample(array, scale, size=(32,59)):
          """returns an array"""
          # interpolate accept size of (B, C, H, W) while B is the batch size, only 1
          return np.rollaxis(
              F.interpolate(
                  F.interpolate(
                      torch.from_numpy(
                          np.expand_dims(
                              np.rollaxis(array, 2),
                              axis=0)
                      ),
                      scale_factor=scale,
                      mode='area'
                  ),
                  size=size,
                  mode='bilinear',
                  align_corners=False
              )[0].cpu().numpy()
          , 0, 3)
```

```
[8]: def benchmark(func, number, frame=60):
         total = 0
         for _ in range(number):
             start = time.perf_counter()
             for _ in range(frame):
                 eval(func)
             diff = time.perf_counter() - start
```

```
        total += diff
        print(f'Took {diff}s')
    print(f'Totally: {total}s')
    print(f'Avg: {total/number}s')
```

[3]:
```
d = d3dshot.create(capture_output="numpy_float")
```

[4]:
```
#high-speed screen capture
d.capture(region=(0, 0, 1920, 1080))
```

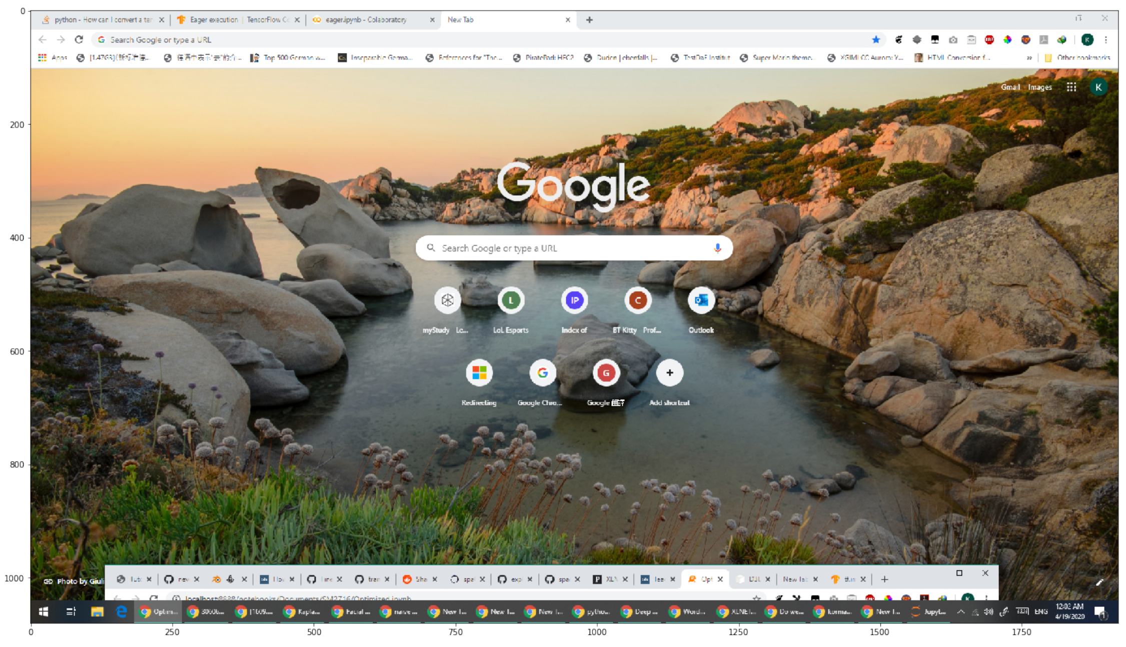
[4]:
```
True
```

[5]:
```
image = d.get_latest_frame()
```

[14]:
```
image.shape
```

[14]:
```
(1080, 1920, 3)
```

[6]:
```
plt.figure(figsize=(24,16))
plt.imshow(image)
plt.show()
```



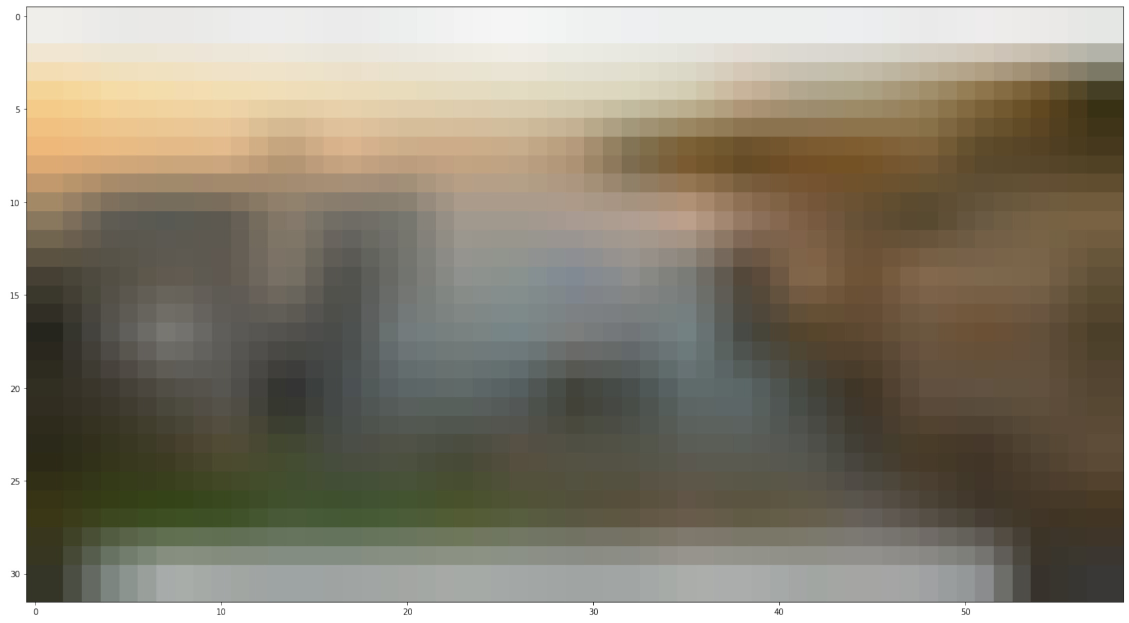
[60]:
```
benchmark('down_up_sample(image, 0.01)', 10)
```

```
Took 1.414898199999925s
Took 1.442575899999838s
Took 1.4391848999998729s
Took 1.5858117000000022s
Took 1.5431316000001516s
Took 1.5460688999999093s
Took 1.597229900000002s
Took 1.4567369000001236s
Took 1.554558100000122s
Took 1.2781084000000646s
Totally: 14.858304500000031s
Avg: 1.485830450000003s
```

[51]:
```
image_r = down_up_sample(image, 0.01)
image_r.shape
```

[51]:
```
(32, 59, 3)
```

[92]:
```
# area
plt.figure(figsize=(24,16))
plt.imshow(image_r)
plt.show()
```



[109]:
```
bottom = image_r[-1, ::-1, :]
```

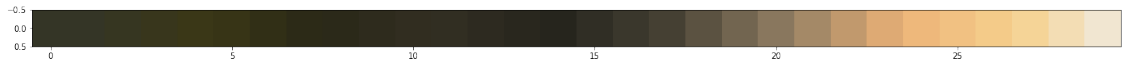
[110]:
```
plt.figure(figsize=(24,16))
plt.imshow(np.expand_dims(bottom, axis=0))
plt.show()
```

−0.5
0.0
0.5
0
10
20
30
40
50

```
[118]: left = image_r[-1:1:-1, 0, :]
       left.shape
```

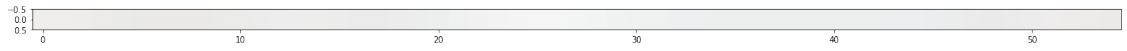
```
[118]: (30, 3)
```

```
[119]: plt.figure(figsize=(24,8))
       plt.imshow(np.expand_dims(left, axis=0))
       plt.show()
```



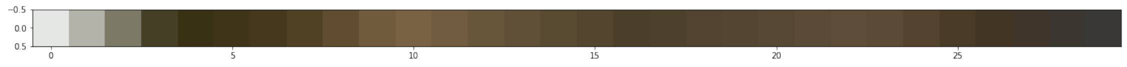
```
[93]: top = np.resize(image_r[0], (55, 3))
```

```
[94]: plt.figure(figsize=(24,16))
      plt.imshow(np.expand_dims(top, axis=0))
      plt.show()
```



```
[120]: right = image_r[1:-1, -1, :]
```

```
[121]: plt.figure(figsize=(24,8))
       plt.imshow(np.expand_dims(right, axis=0))
       plt.show()
```



```
[128]: def image_to_signal(array, brightness):
           return np.multiply(
               np.concatenate(
                   (array[-1, ::-1, :], array[-1:1:-1, 0, :], np.resize(array[0], (55,␣
         ↪3)), array[1:-1, -1, :]),
                   axis=0
               ).flatten(),
               brightness
           ).astype(int)
```

[132]:
```
benchmark('image_to_signal(image_r, 255)', 10)
```

```
Took 0.005329600000095525s
Took 0.0036660000000665605s
Took 0.004640499999823078s
Took 0.0032264999999824795s
Took 0.003590799999983574s
Took 0.0033863999997265637s
Took 0.0032791999997243693s
Took 0.003515400000196678s
Took 0.003235799999856681s
Took 0.003321700000014971s
Totally: 0.037191899999947048s
Avg: 0.0037191899999947048s
```

[131]:
```
image_to_signal(image_r, 255).shape
```

[131]:
```
(522,)
```

[ ]:
```

```