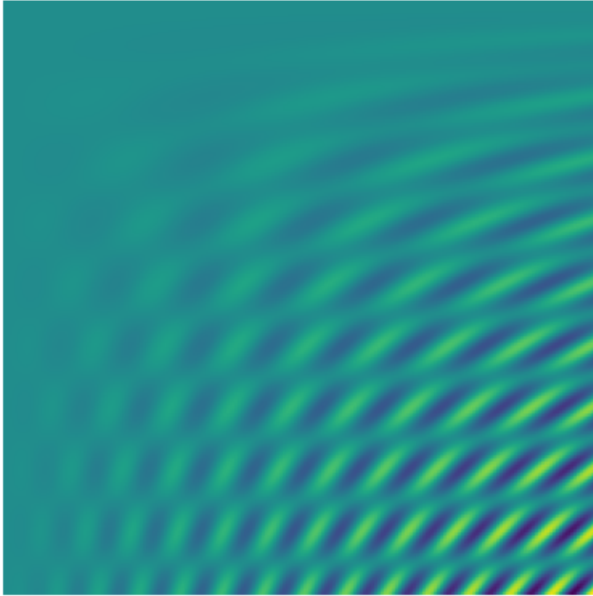


CT5132/CT5148 Lab Week 10

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Recall our exercise on grammars and generative art. Here is the necessary code for rendering an image. You can paste it into a notebook.

```
G = {
    "<expr>" : [[("<expr>", "<biop>", "<expr>", ")"],
                ["<uop>", "<expr>"], ["<var>"], ["<const>"]],
    "<biop>" : [["and"], ["or"]],
    "<uop>"   : [["not"]],
    "<var>"   : [["x[0]"], ["x[1]"], ["x[2]"]],
    "<const>": [["True"], ["False"]]
}

import random
def derive_random_str(G, start):
    if start in G: # start is a non-terminal
        return " ".join(derive_random_str(G, p)
                        for p in random.choice(G[start]))
    else: # start is a terminal
        return start

import numpy as np
```

```

import matplotlib.pyplot as plt
import matplotlib.cm as cm

n = 200
xs = np.linspace(0, 1, n)
ys = np.linspace(0, 1, n)
x, y = np.meshgrid(xs, ys)

ps = "np.sin(90 * x * y) * np.sin(30 * (y+0.1)) * x * y"
p = eval("lambda x, y: " + ps)
plt.axis('off'); plt.imshow(p(x, y));

```

Try altering the grammar G , and replace `ps` with a string derived from G .