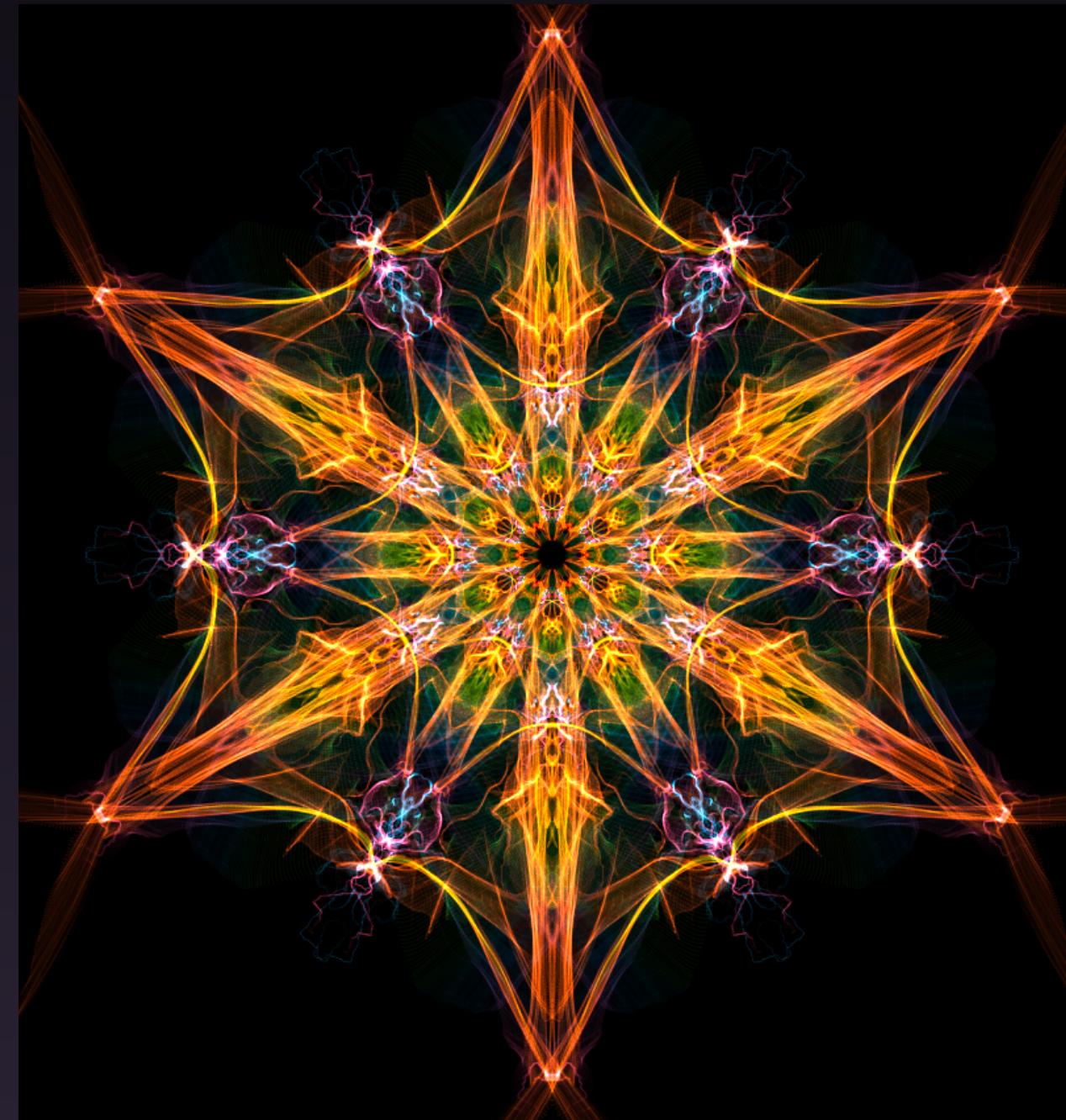


Generative Art with Julia

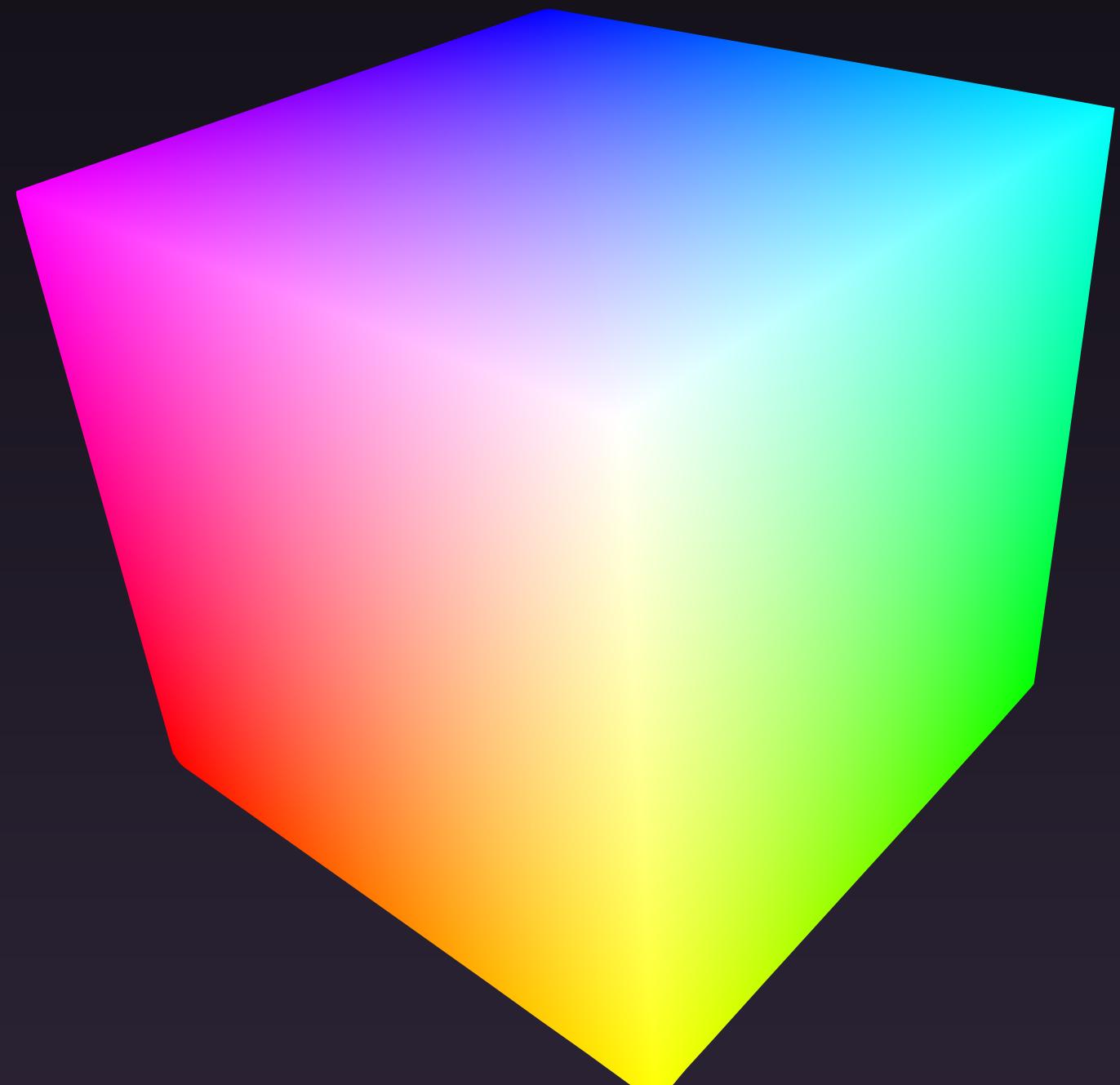
Generative Art

Making beautiful pictures with algorithms



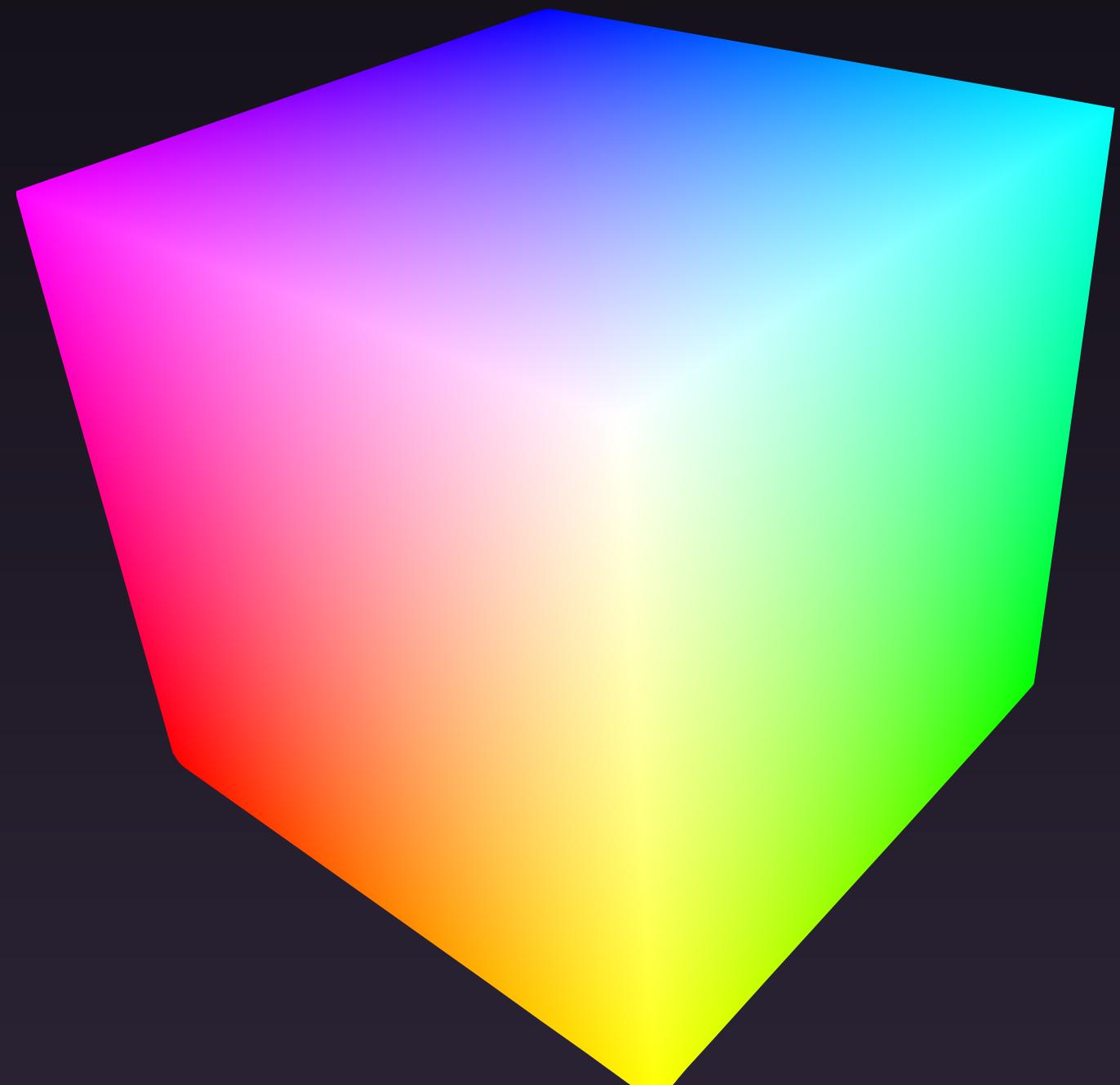
Question

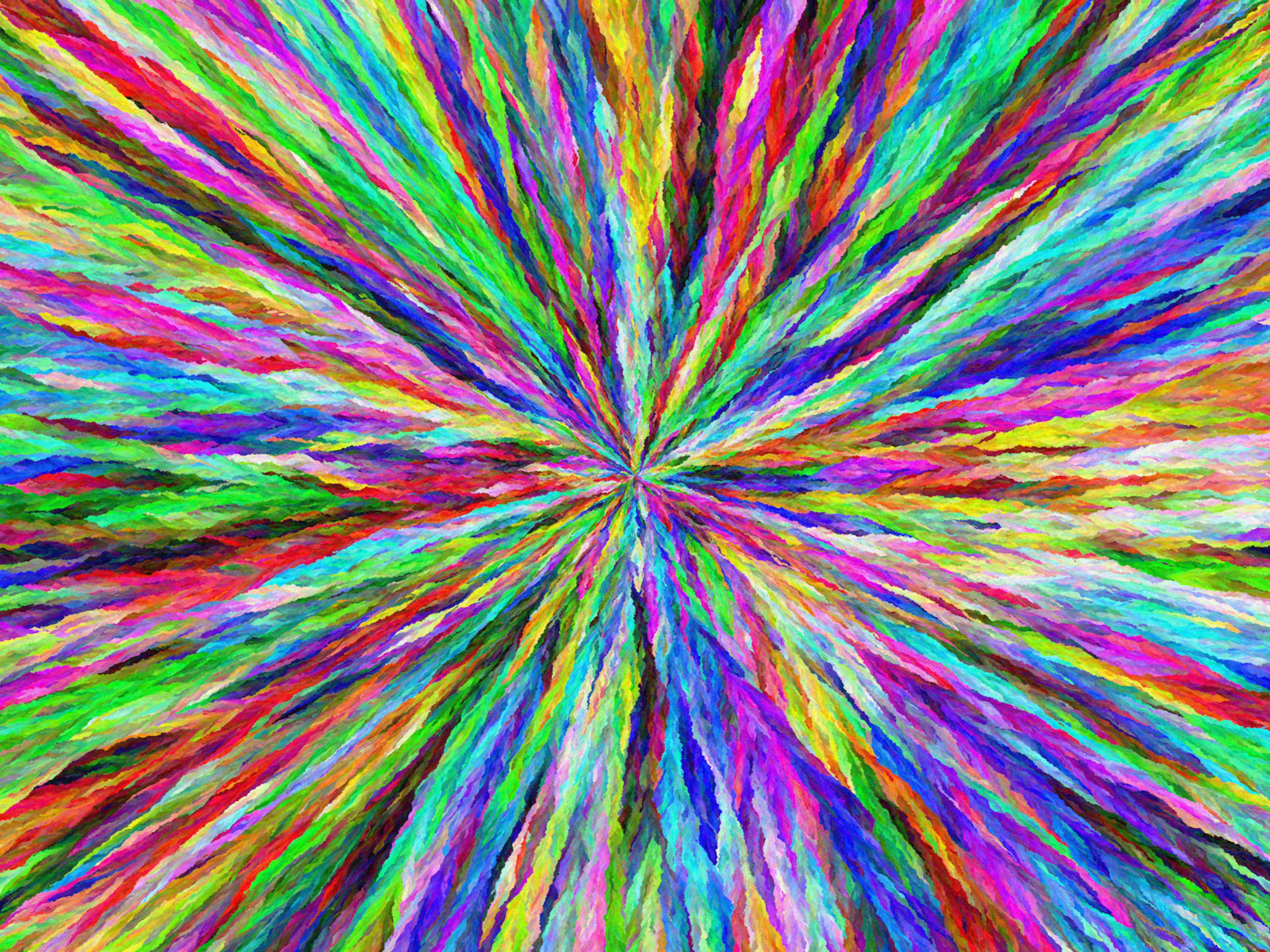
Imagine you have all of the representable colors on the RGB color cube...



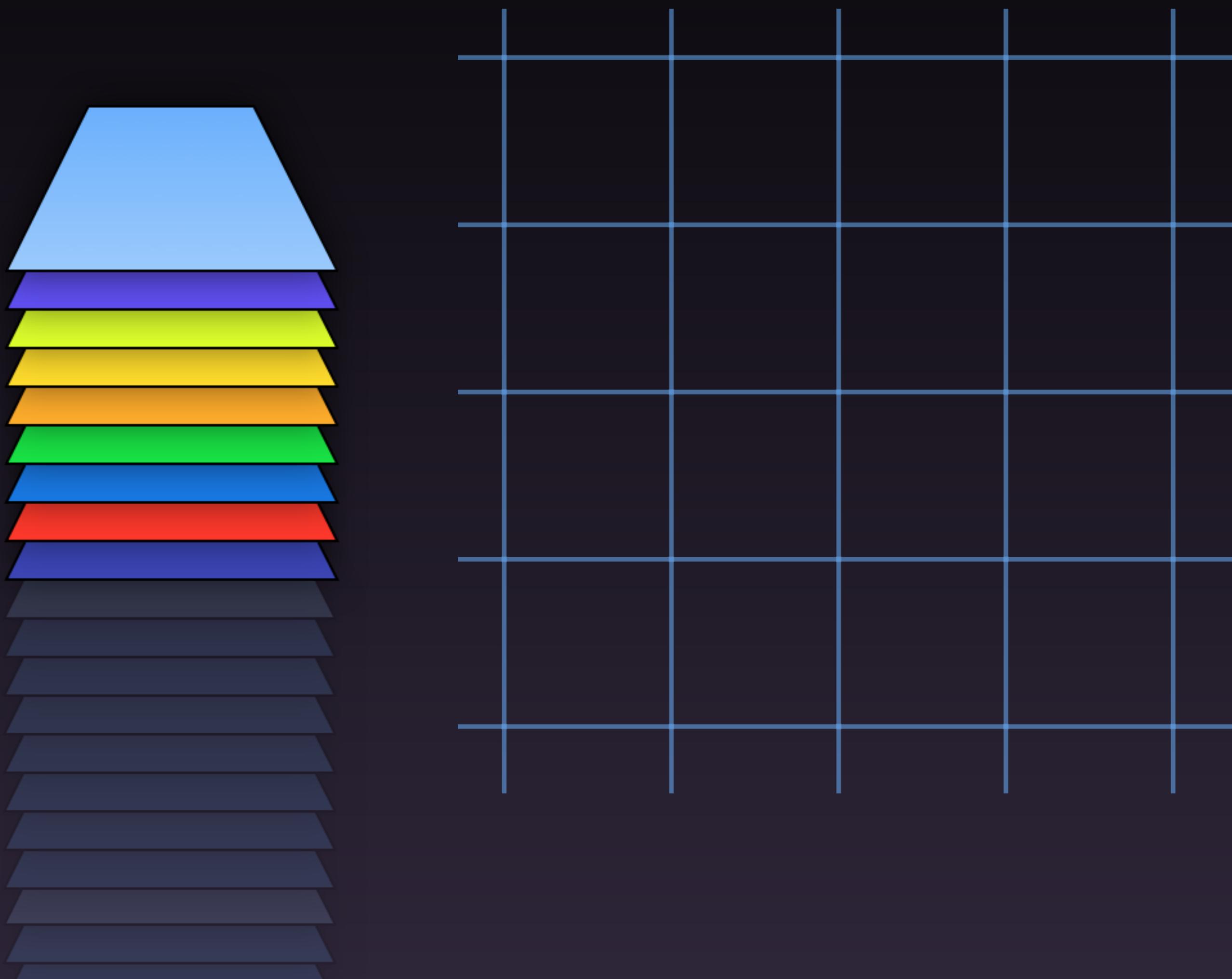
Question

What if you made a picture that used each color once and once only?

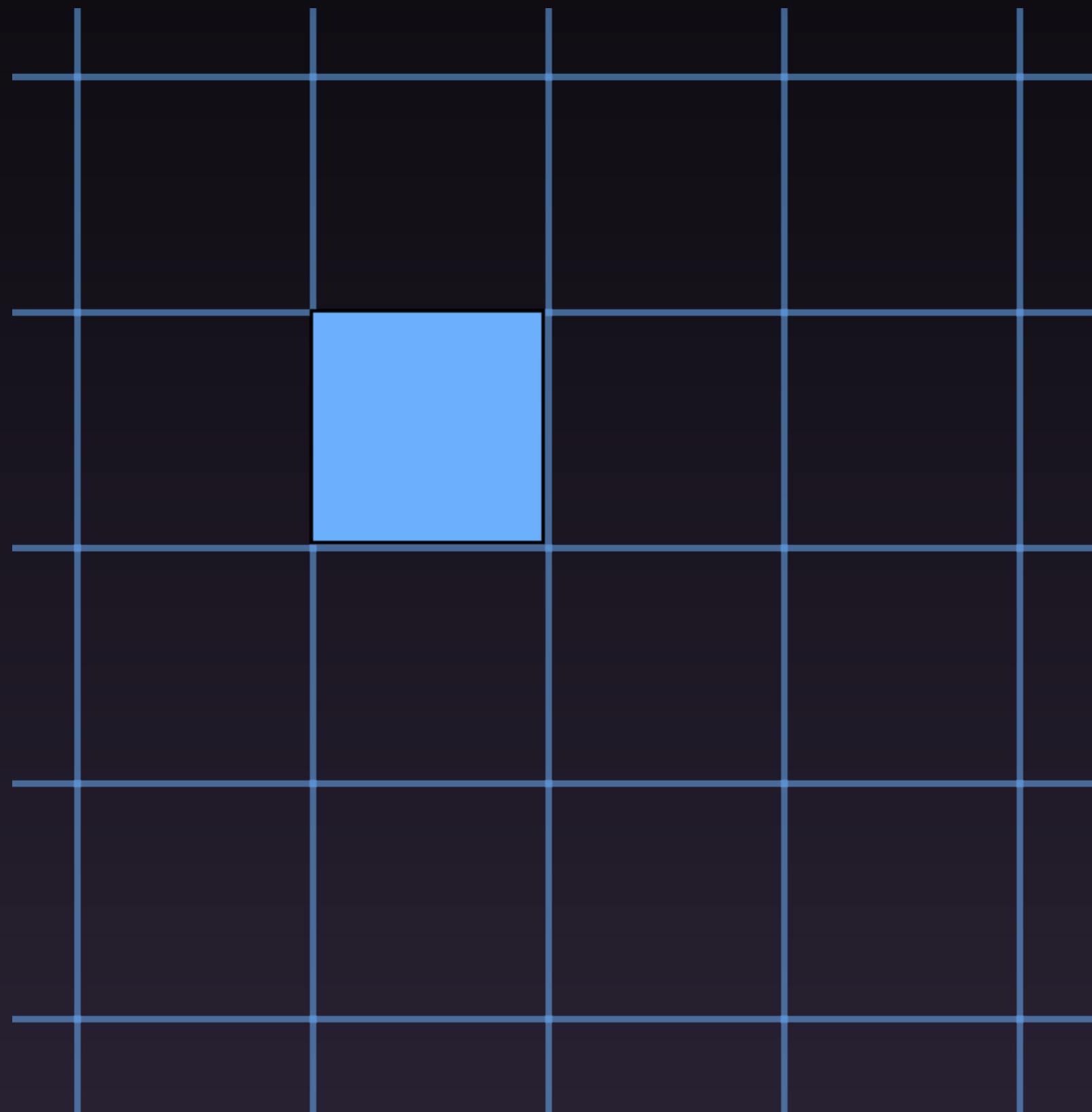




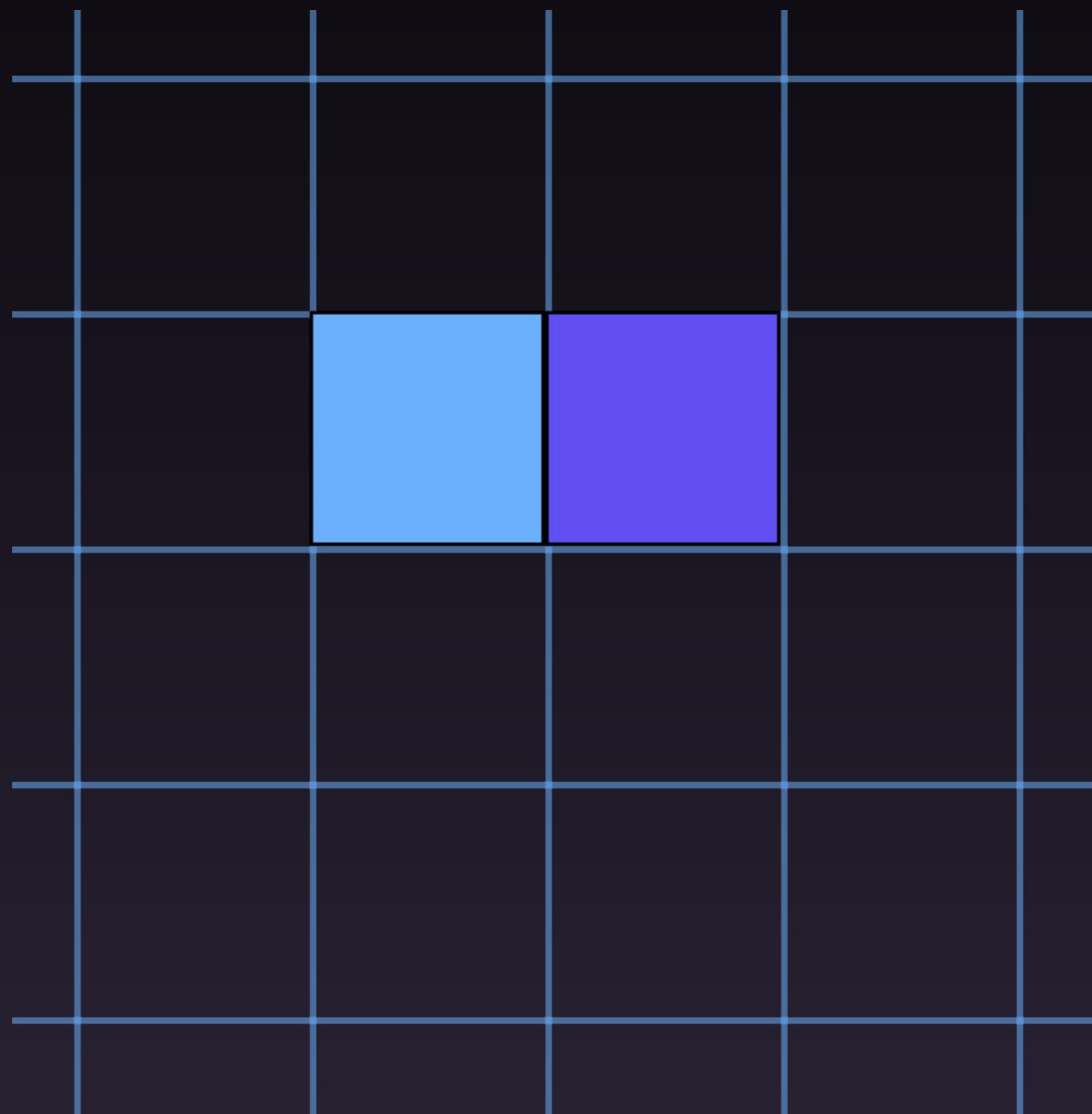
How Does it Work?



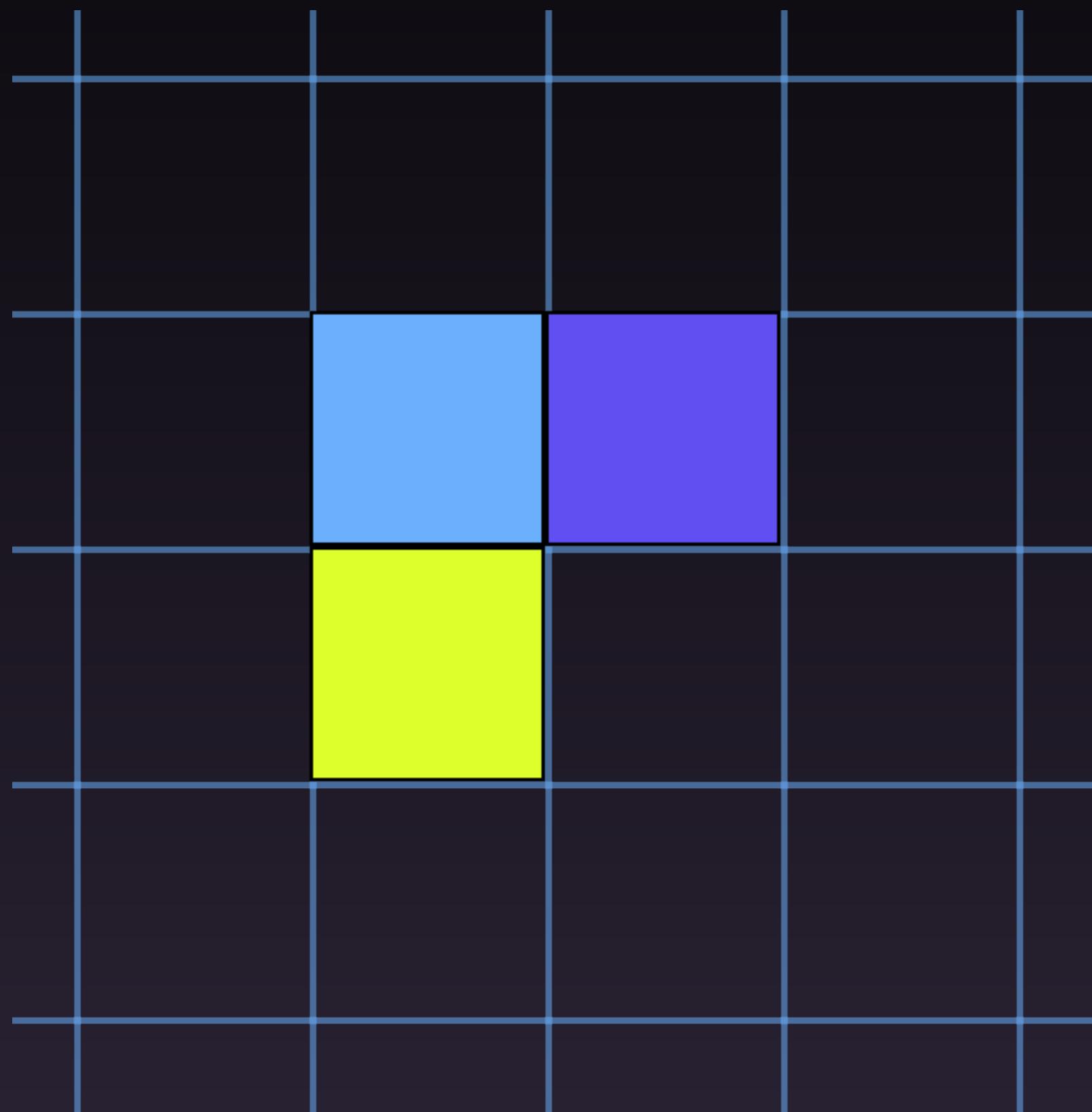
How Does it Work?



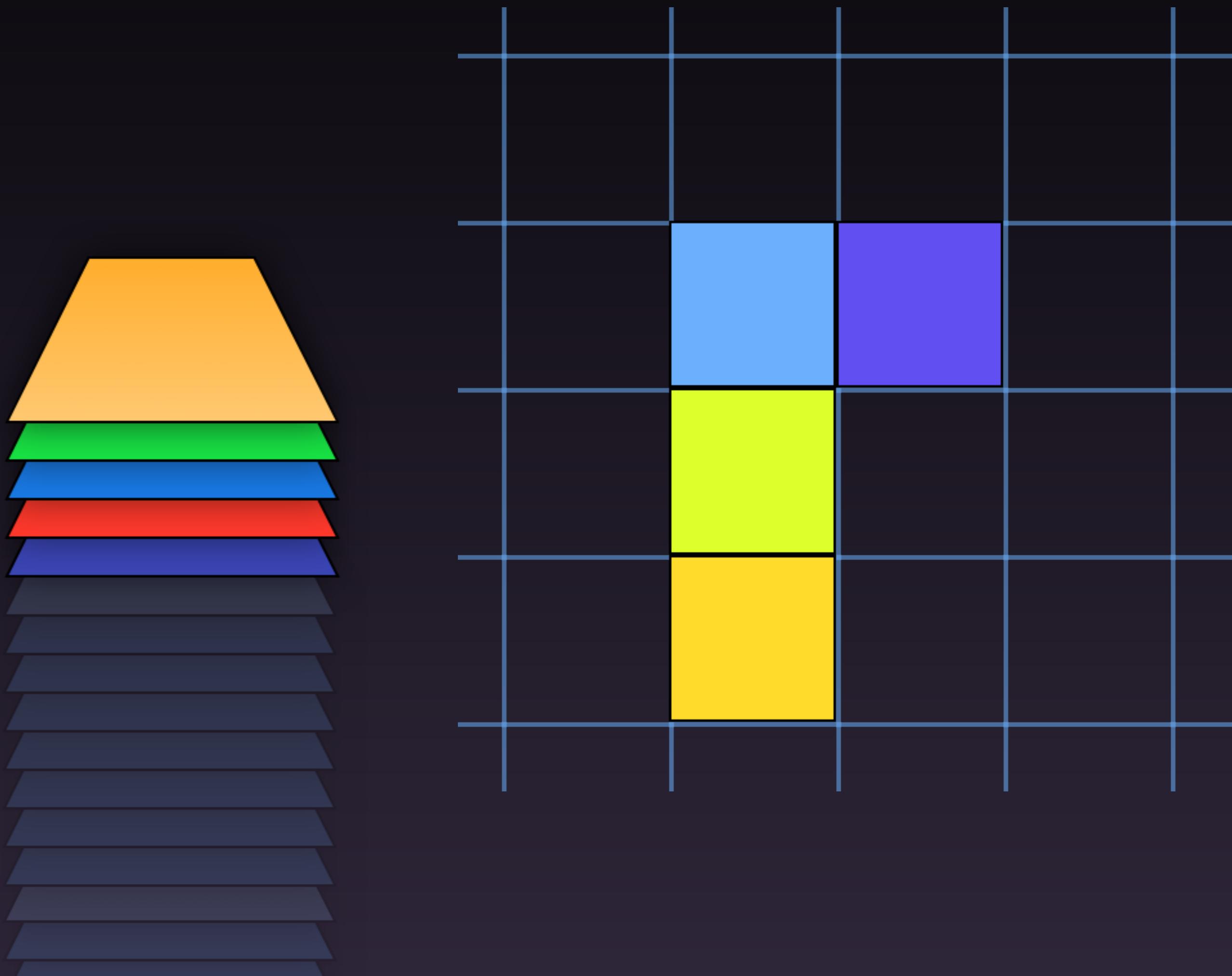
How Does it Work?



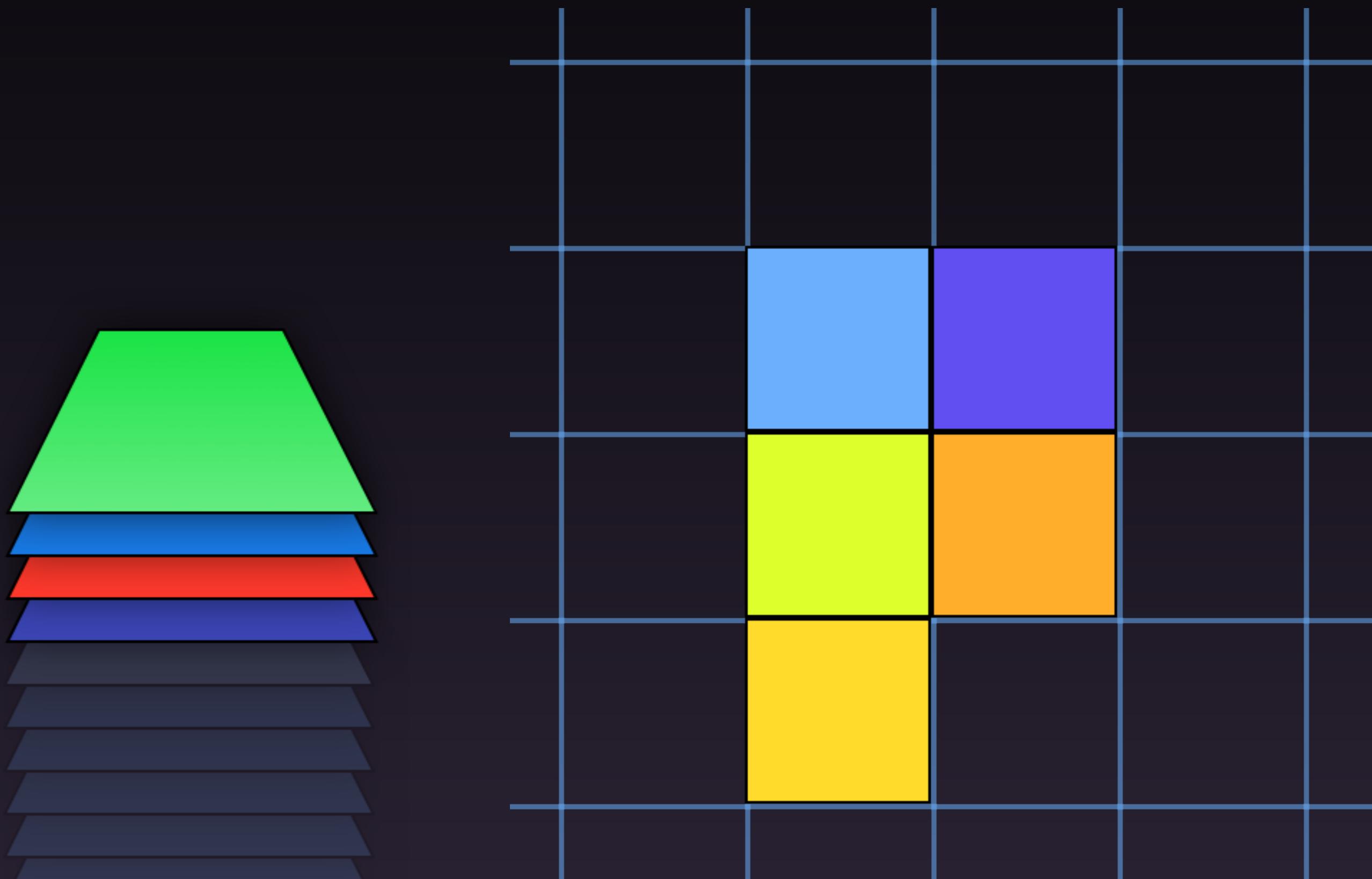
How Does it Work?



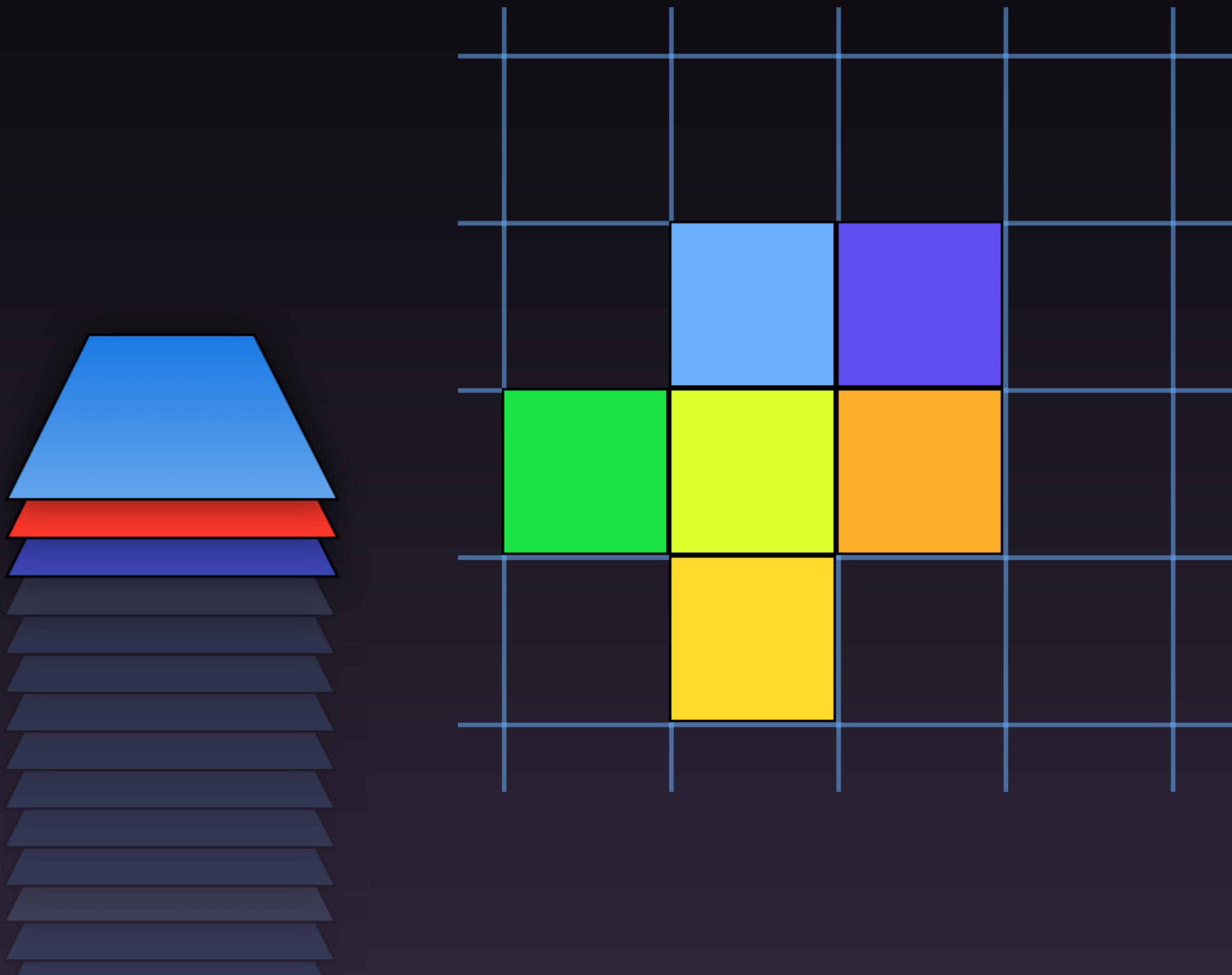
How Does it Work?



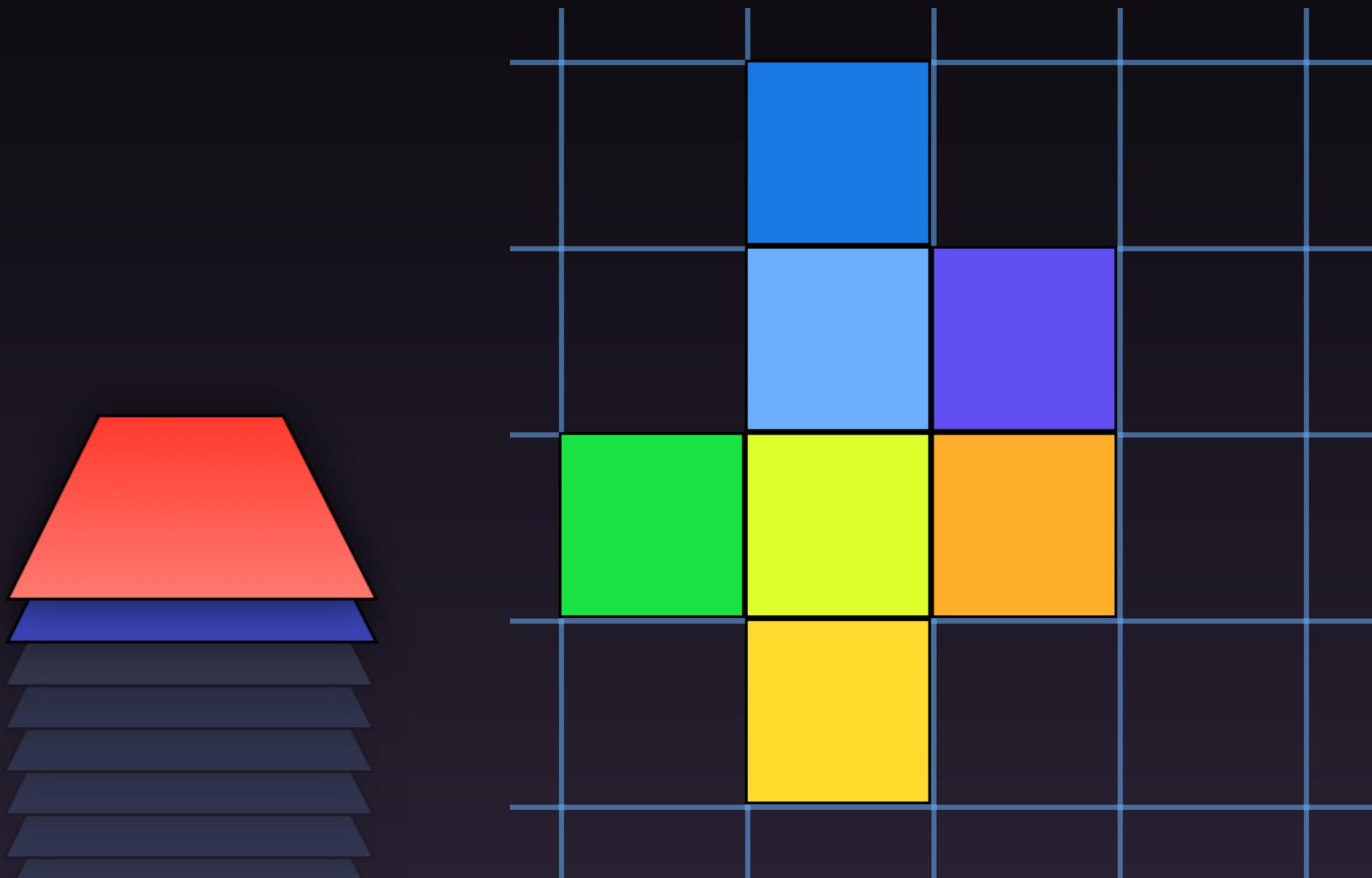
How Does it Work?



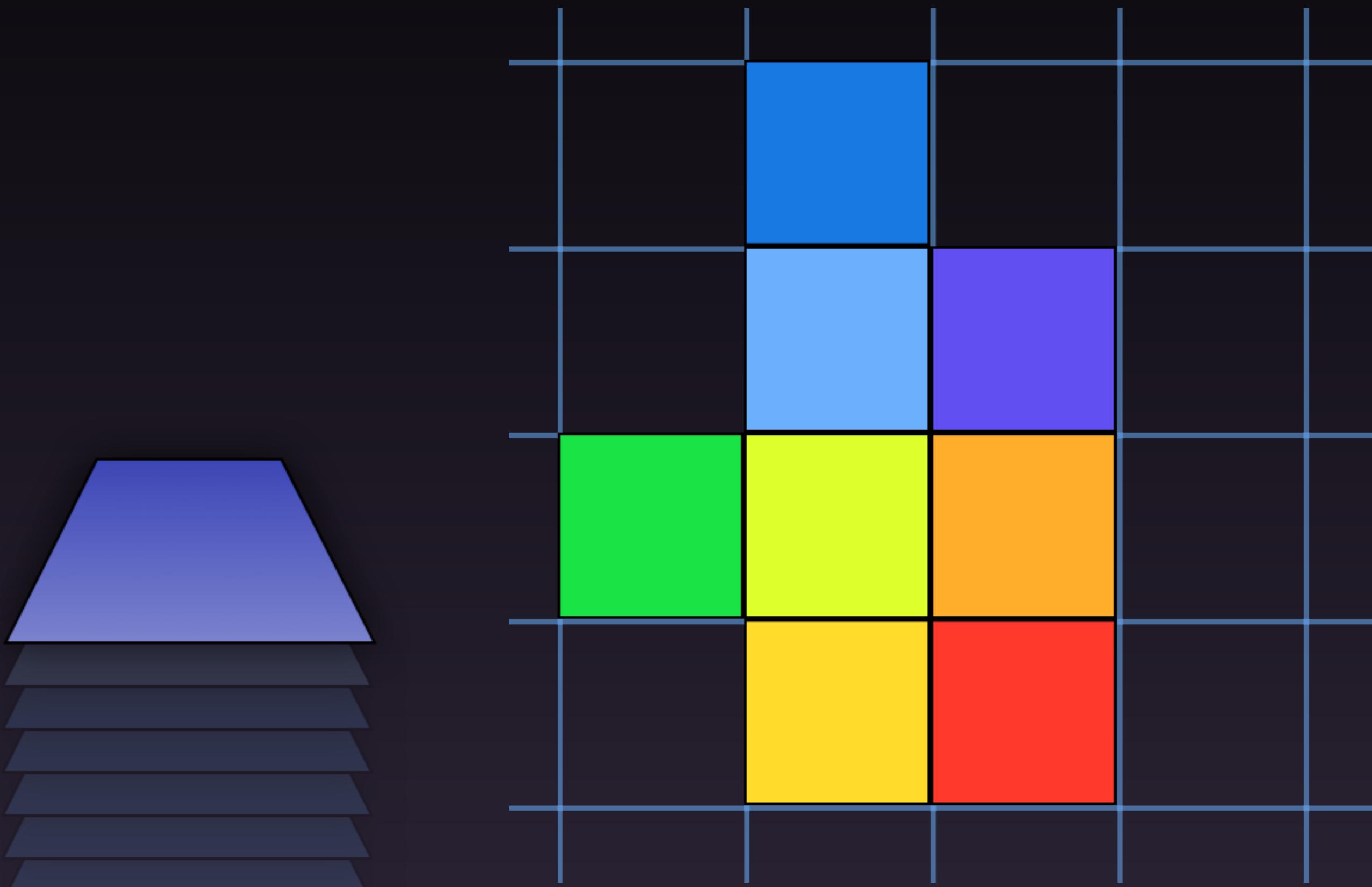
How Does it Work?



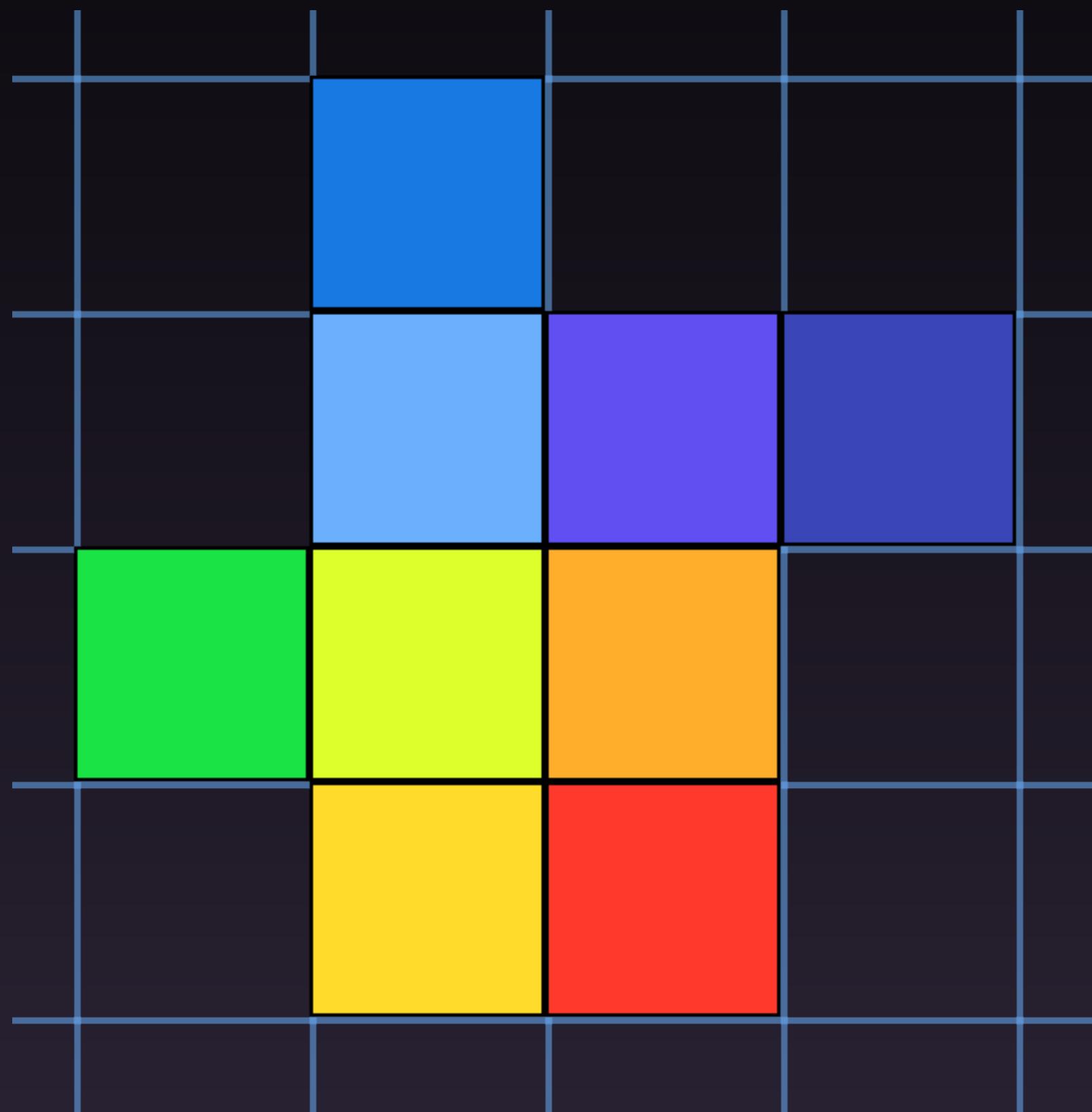
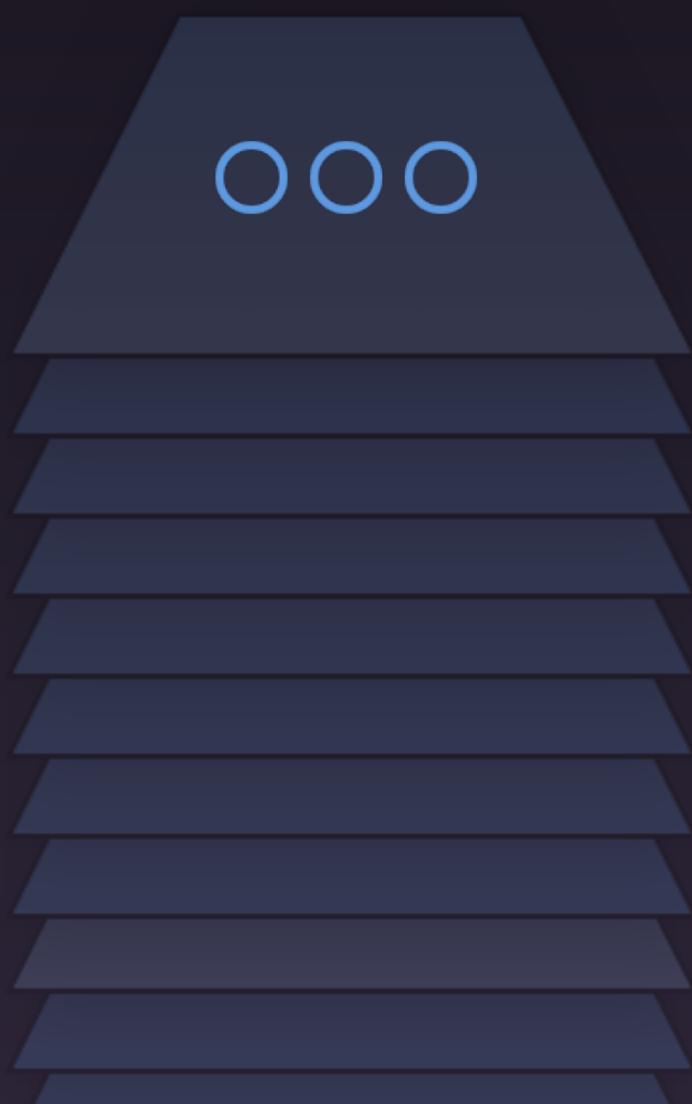
How Does it Work?



How Does it Work?



How Does it Work?





All colors, ordered by hue

A photograph of a dense forest of tall evergreen trees. The trees are closely packed, creating a dark green canopy. In the center of the image, there is a small, lighter-colored clearing where a few smaller trees or shrubs are visible. The overall scene is a natural, undisturbed forest.

This was a photograph of...



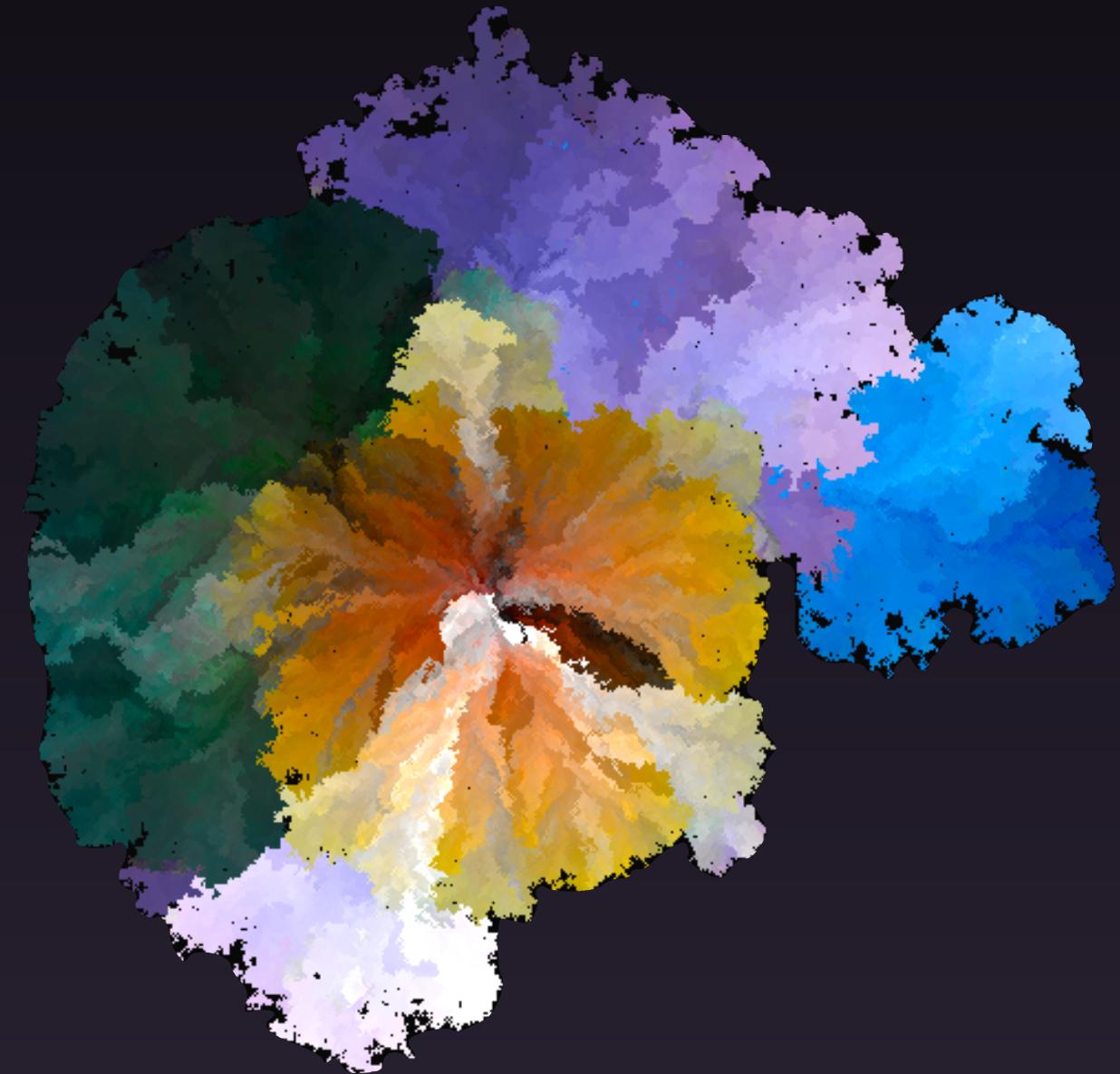
A photograph of a forest landscape. In the foreground, there are several tall, dark evergreen trees. Behind them, the forest is filled with a variety of deciduous trees displaying autumn colors. The leaves are a mix of deep reds, fiery oranges, bright yellows, and golden browns, creating a rich tapestry of fall foliage.

This was a photograph of...



The Technical Side

Lots of pixels, not enough time.



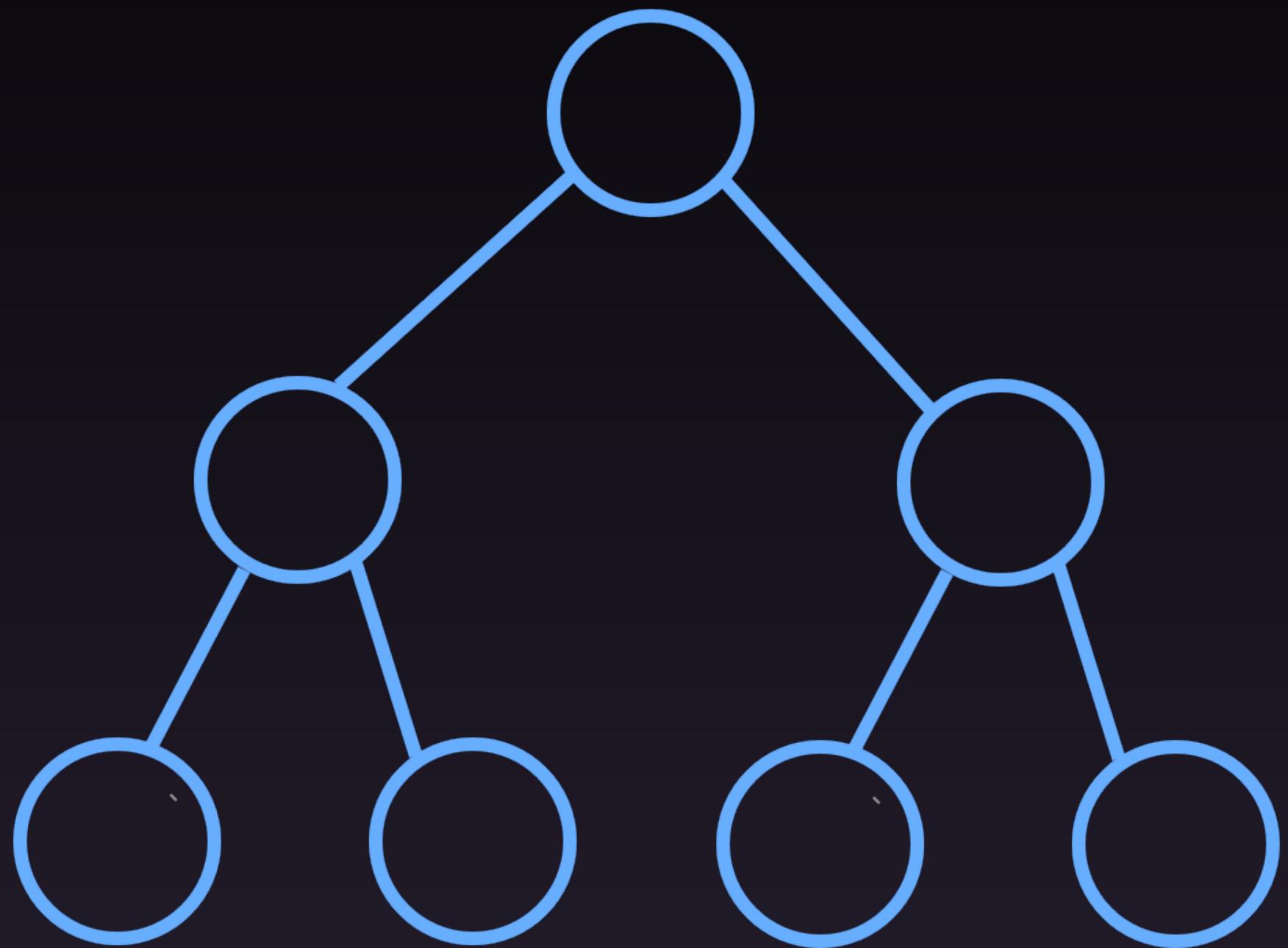
Placing a pixel is slow: $O(\text{size of frontier})$

Solution: Spatial Search



Efficient approximate nearest-neighbor search
in low-dimensional spaces (Chan 2006)

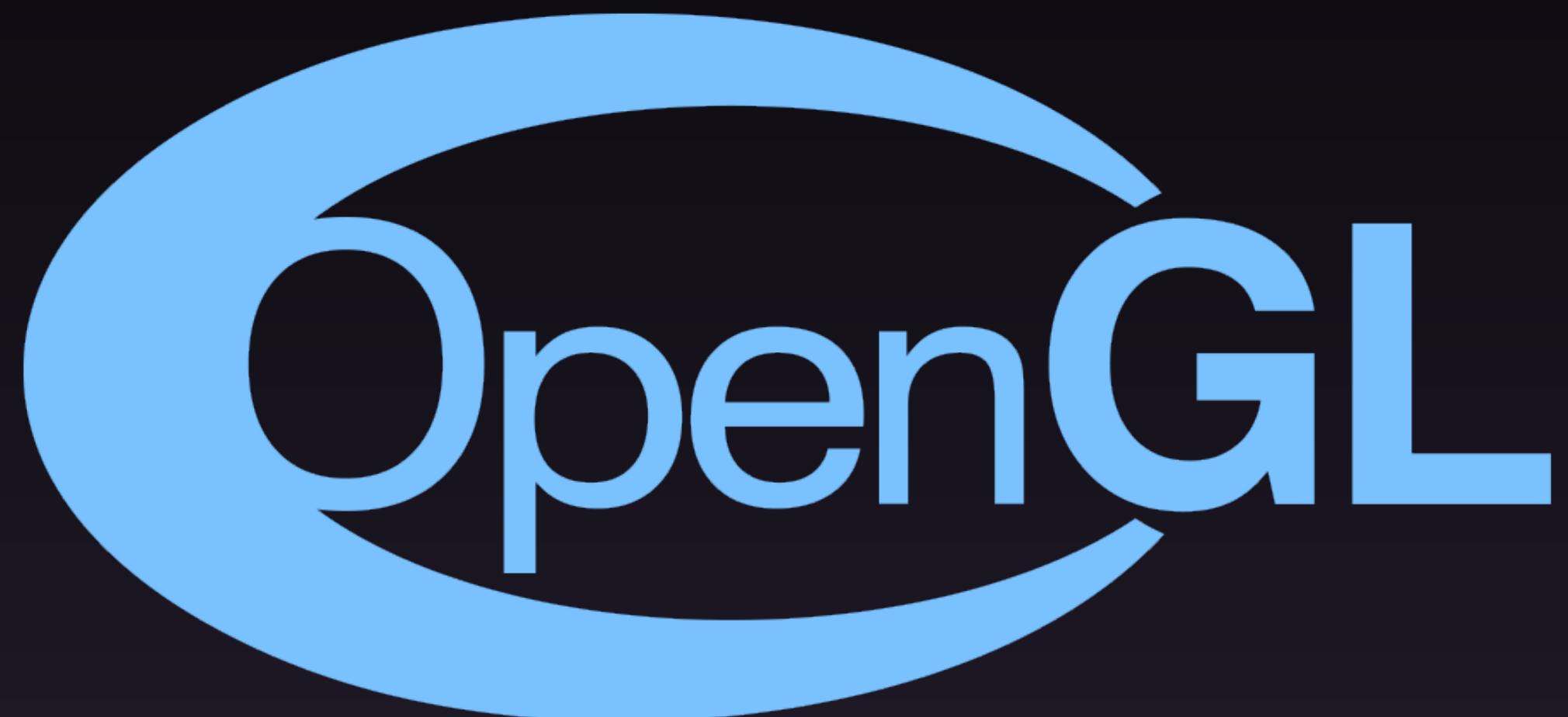
Treap



Self-balancing binary search tree for unique values

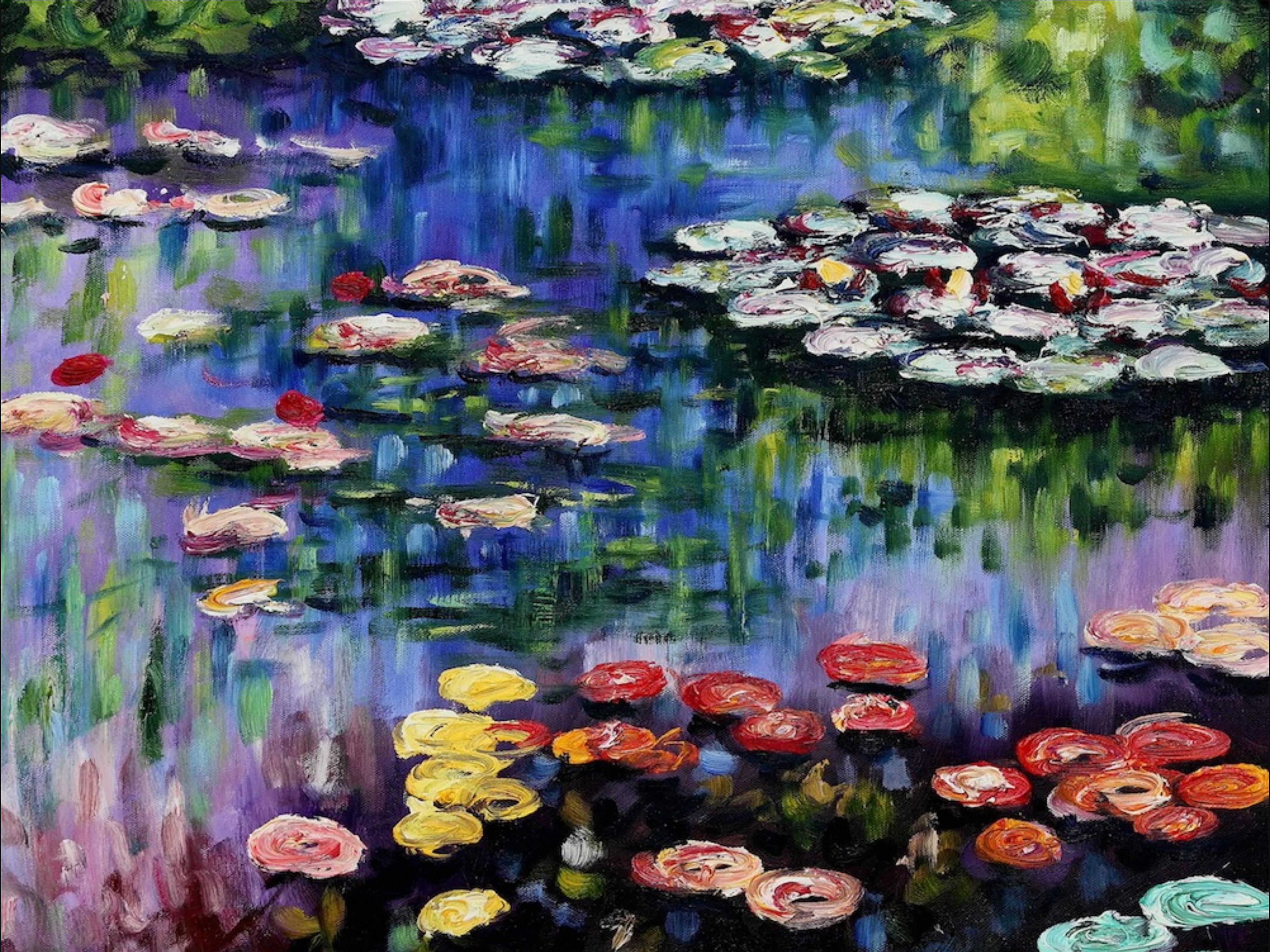
Lets you maintain a sorted list with fast insertions + deletions

Interactive Graphics



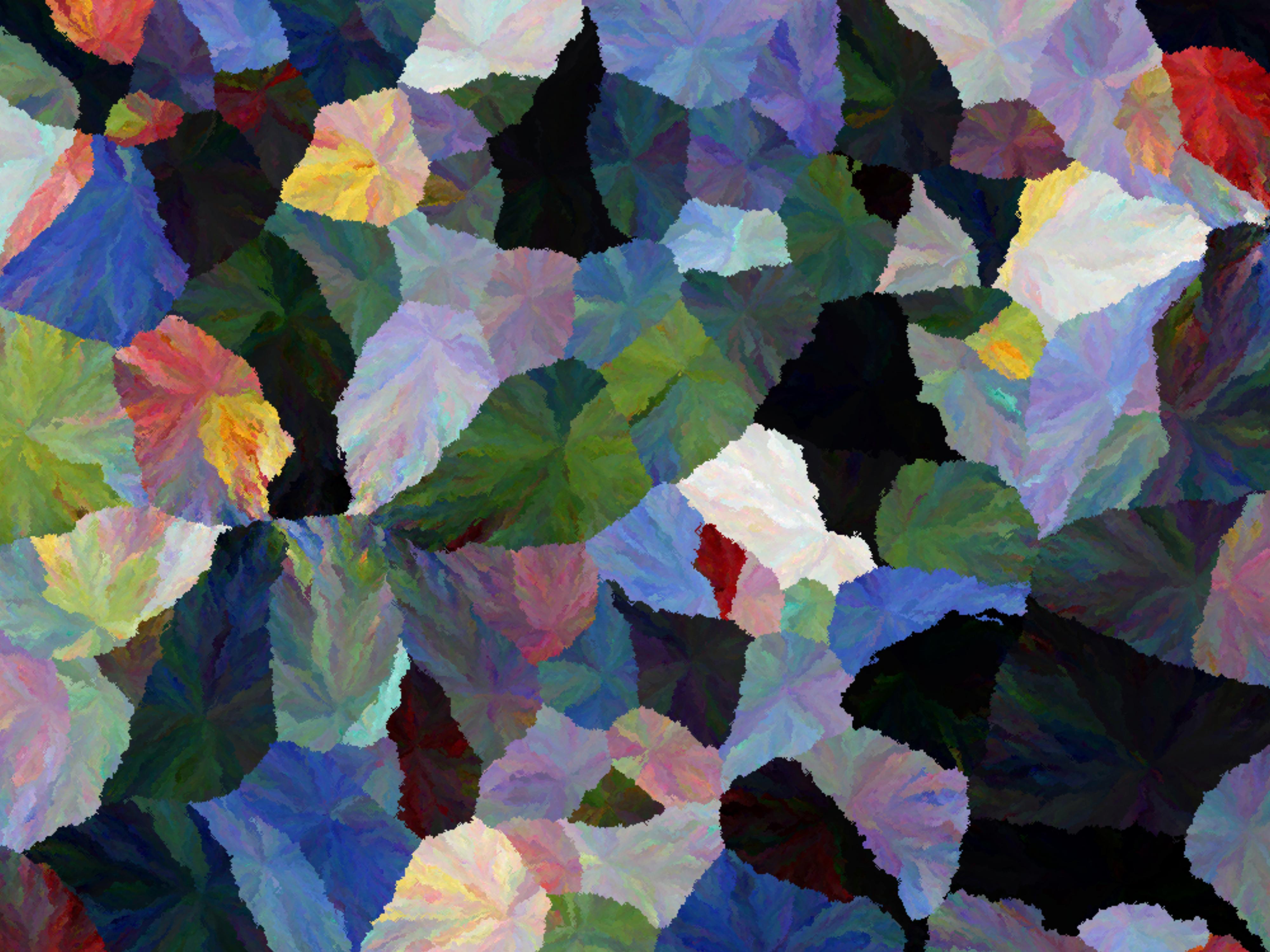
A small starter kit for OpenGL development

Basic standalone example + utility functions









Thank You!

Twitter: **@yurivish**

Github: **@yurivish**

Repository: **Julia-Playground**

Original thread: **goo.gl/Kv34Hk**