

The background is a light gray grid with various colored squares (black, white, gray, yellow, green, blue, red, purple, orange) and lines. Some squares have shadows, giving a 3D effect. The overall style is modern and tech-oriented.

# AR/VR Workshop Introduction

Phillip G. Bradford

# Full select demo – how you can do ...



[Basic-Mars-Landing](#)

# Learning plan

Introduction	Description
Overview Demo	Where you will be when you finish this module
Foundations	
A-frame components	
Three.JS and A-frame	
Entity component architecture (ECA)	
A-frame and planets	
A-frame and animations	
Conclusion	

# Module demo highlights: 3D image



# Outline

Overview

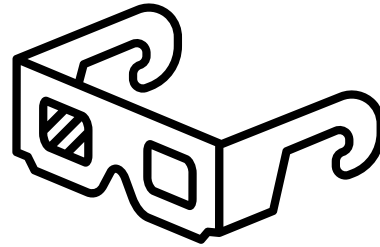
No installations needed

Glitch

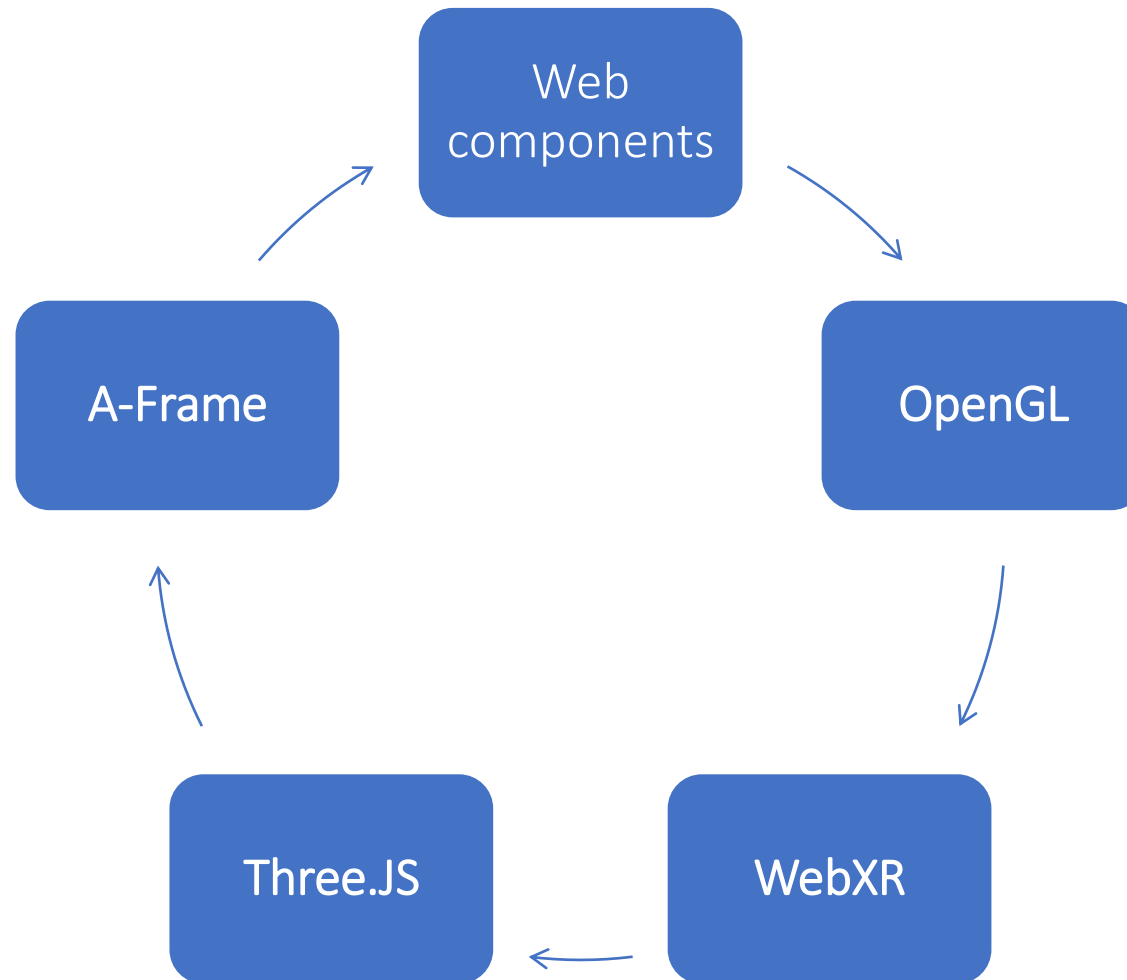
What is Glitch.com?

Get an account in Glitch.com

Our first VR/AR examples



# High level view and learning path



# A-frame

3D virtual reality system built by Mozilla

**A-frame** is a component system built on **Three.js**

**Three.js** is built on **WebXL** which is built on **WebGL**

**A-frame** is HTML that uses web-components

Declarative – tell it what you want to see,  
it figures out how to do it

# No installation VR

Nothing installed

You may use Python3

To get started, get a free account on **Glitch.com**



# What is glitch?

Cloud-based development environment

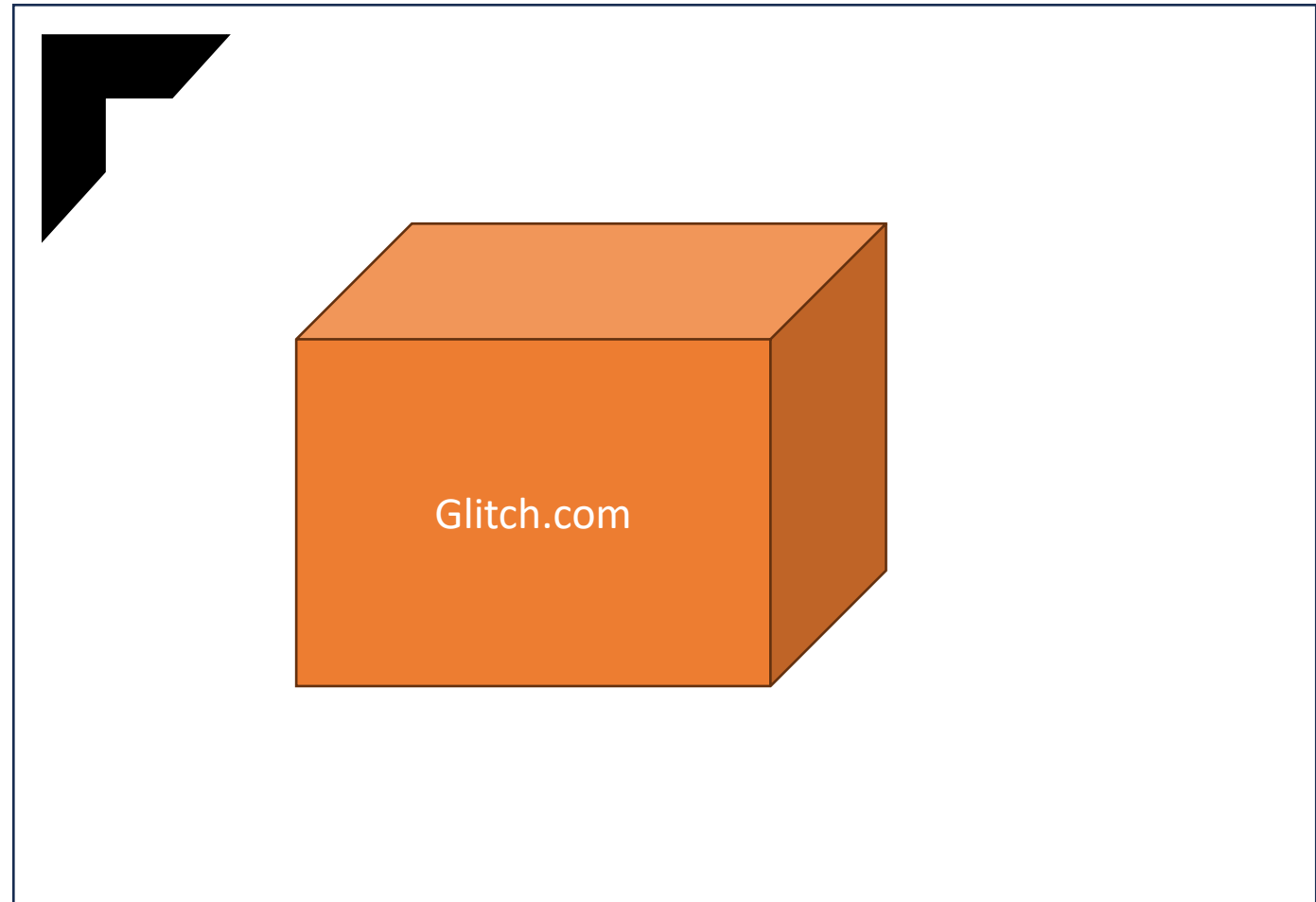
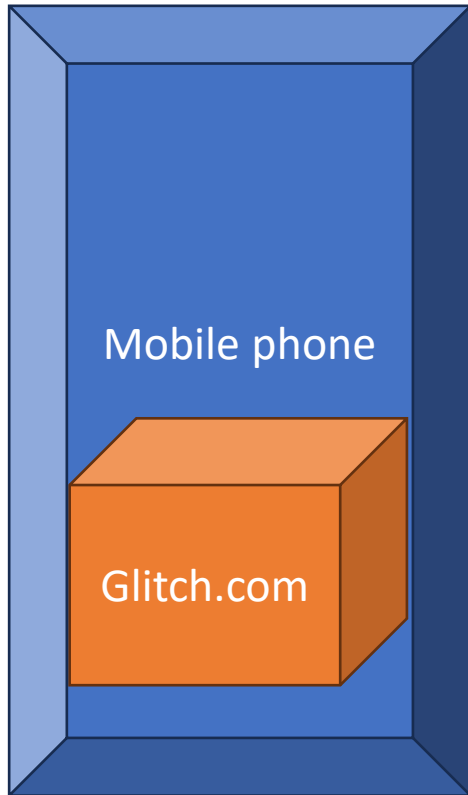
Fast development

Gives you a URL for each project

**A-Frame** is run through the on-line glitch environment

# Glitch.com Overview

Computer



# Sign up for glitch

Glitch can stand alone or can be hooked to via google

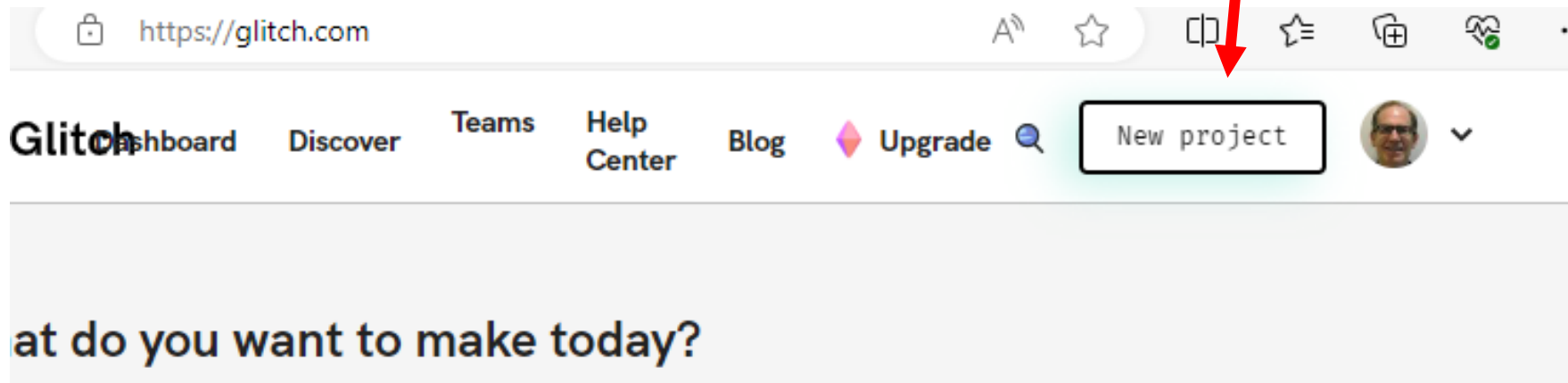
Once you signed up on **glitch** the same account can be simultaneously on your laptop and your phone

Changes in **glitch** on your laptop will be seen on your phone

# Using A-frame in glitch

Once you create a glitch.com account  
access A-frame as a new project

New Project

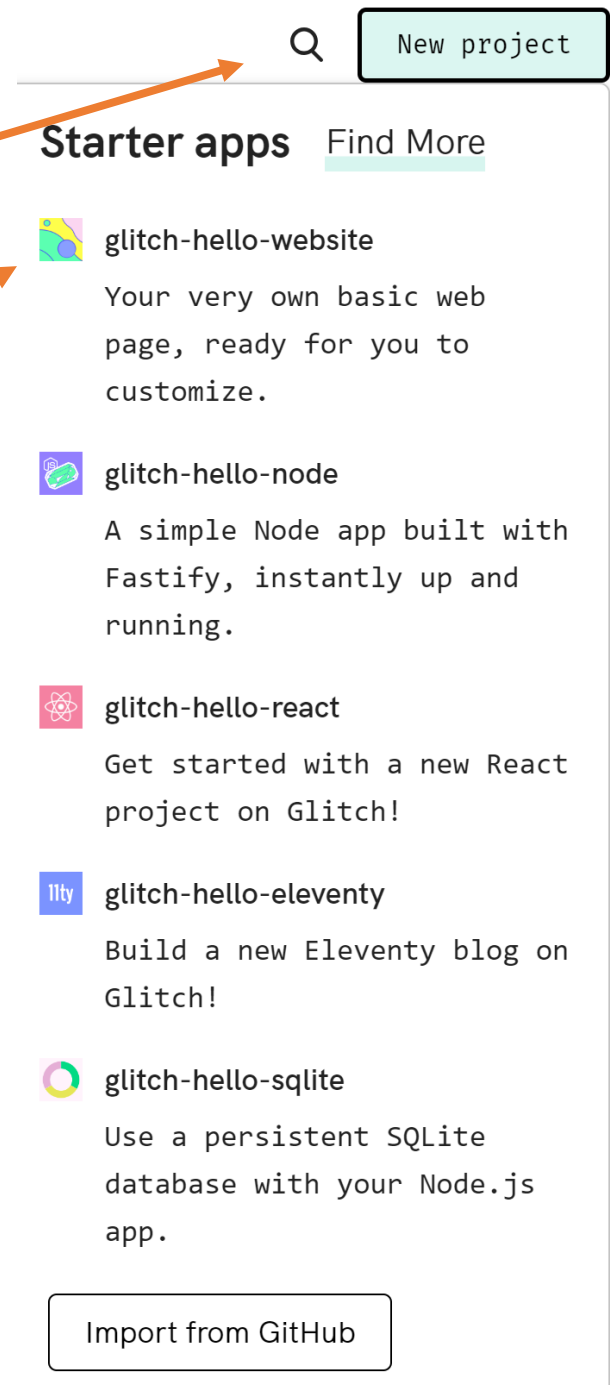


# Glitch Hello Website

Select






New project

Select glitch-hello-website



The screenshot shows the 'New project' modal on the Glitch website. At the top right, there is a search icon and a 'New project' button. Below this, the 'Starter apps' section is displayed, with a 'Find More' link. A list of starter apps is shown, each with an icon, a title, and a description. Two orange arrows point from the text on the left to the 'New project' button and the 'glitch-hello-website' app in the list.

**Starter apps** [Find More](#)

-  **glitch-hello-website**  
Your very own basic web page, ready for you to customize.
-  **glitch-hello-node**  
A simple Node app built with Fastify, instantly up and running.
-  **glitch-hello-react**  
Get started with a new React project on Glitch!
-  **glitch-hello-eleventy**  
Build a new Eleventy blog on Glitch!
-  **glitch-hello-sqlite**  
Use a persistent SQLite database with your Node.js app.

[Import from GitHub](#)

# Basic HTML

```
<html>
```

```
  <head>
```

```
    </head>
```

```
  <body>
```

```
    </body>
```

```
</html>
```

# Working with Glitch

Replace the original index.html in Glitch with

1. The contents of not-index.html in p01
2. Find the same project on your phone name as Glitch shows on your laptop
3. Put your Virtual Reality Glasses on you phone and look through them
4. You should see **HELLO A-Frame!!!** on a dark blue background

All that work and we end up with a blue background!  
How can we improve the background?

# Replace index.html with not-index.html

```
<html>
<head>
  <meta charset="utf-8">
  <title>Hello A-Frame Example</title>
  <script src="https://aframe.io/releases/1.4.1/aframe.min.js"></script>
</head>
<body>
  <a-scene>
    <a-sky color="#0000EE"></a-sky>
    <a-text
      font="kelsonsans"
      color = "#FFFFFF"
      value="HELLO A-Frame!!!"
      width="6"
      position="0 -1 -5"
    ></a-text>
  </a-scene>
</body>
</html>
```

## **<a-scene>**

```
<a-sky color="#0000EE">
</a-sky>
<a-text
  font="kelsonsans"
  color = "#FFFFFF"
  value="HELLO A-Frame!!!"
  width="6"
  position="0 -1 -5"
></a-text>
</a-scene>
```



# VR glasses steps

Login to your **glitch** account on your phone to synchronize it with your laptop

On your phone go to your Dashboard

Go to Projects

Select the same project you are working on in your laptop

Use VR glasses to view the project on your phone

# simple-sky.html

<a-scene>

<a-sky color="#0105EF">     Select a color at [https://www.w3schools.com/colors/colors\\_picker.asp](https://www.w3schools.com/colors/colors_picker.asp)  
</a-sky>

<a-text

font="kelsonsans"

color = "#FFFFFF"

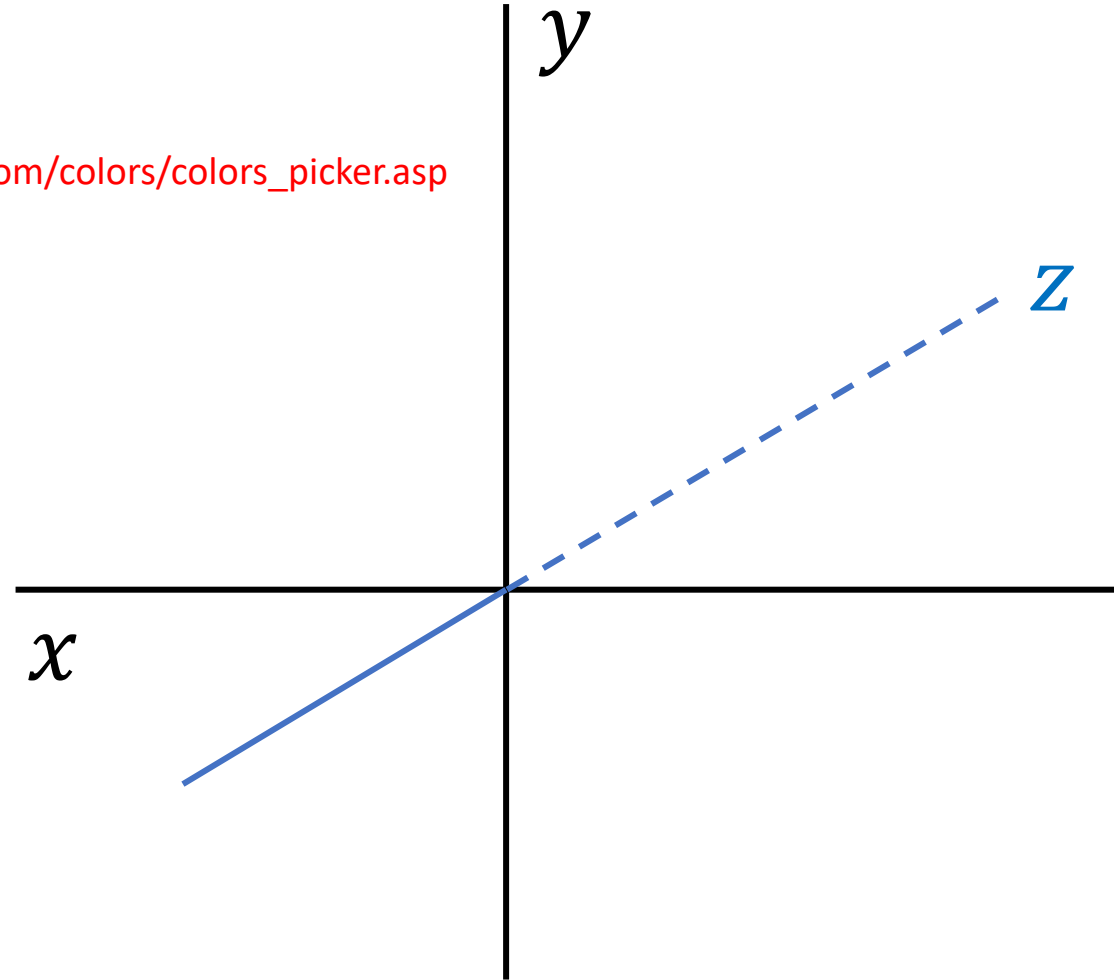
value="HELLO A-Frame!!!"

width="6"

position="0 -1 -5"     Note: x-horizontal, y-vertical, and z-depth\*  
></a-text>

</a-scene>

\*this translates to 1 meter below the origin and 5 meters into the page



# simple-sky.html: changing the view

```
<a-scene>  
  <a-sky color="#0105EF">  
  </a-sky>  
  <a-text  
    font="kelsonsans"  
    color = "#FFFFFF"  
    value="HELLO A-Frame!!!"  
    width="6"  
    position="0  -1  -5"  
  ></a-text>  
</a-scene>
```

Replace the current index.html on glitch  
with Simple-sky.html

← a-scene now looks like this

# How to upload a picture into glitch

To use a photo (**Moving\_Forest\_1050\_700.webp** in p01/IMAGES) as a background upload it into glitch this way

Make sure to copy the new URL something like

```
<a-sky  
    src="https://cdn.glitch.global/4cb2dafe-67a2-4c7f-b424-  
b5ef32487f34/Moving_Forest_1050_700.webp?v=1696984169228">  
</a-sky>
```

# Adding a picture to simple-sky.html

```
<html>
<head>
  <script src="https://aframe.io/releases/1.4.1/aframe.min.js"></script>
</head>
<body>
  <a-scene>
    <a-sky
      src="https://cdn.glitch.global/4cb2dafa-67a2-4c7f-b424-b5ef32487f34/Moving_Forest_1050_700.webp?v=1696984169228"
    >
  </a-sky>
  <a-text
    font="kelsonsans"
    value="HELLO A-Frame from Earth!!!"
    width="6"
    position="-2.5 0.25 -1.5"
  ></a-text>
</a-scene>
</body>
</html>
```

# Putting it all together

You have now created virtual reality text on a 3D background

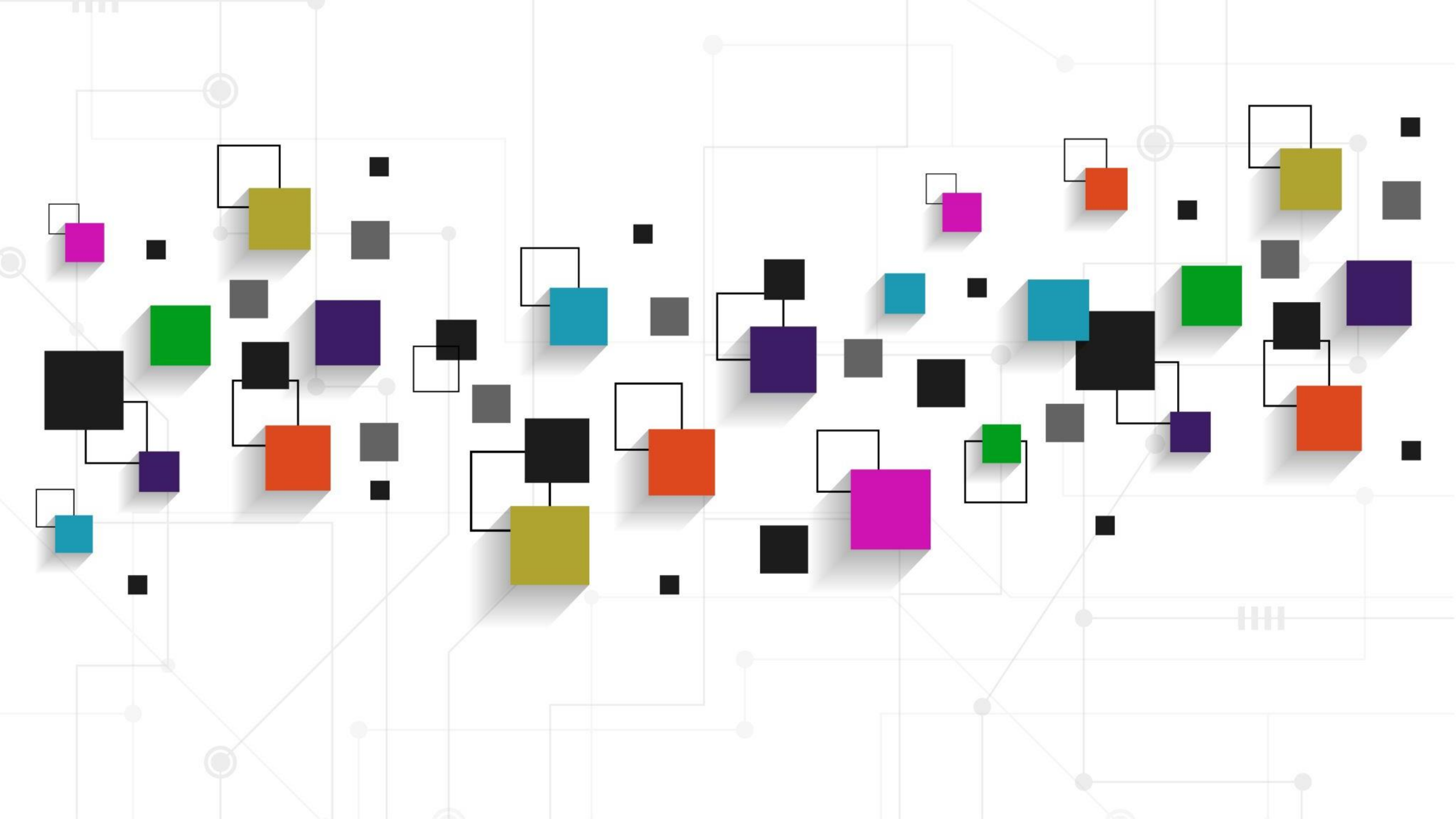
We can also

1. Change background – to the nebula

What if it doesn't work? TROUBLESHOOTING!

2. Move text around in the nebula

What if it doesn't work? TROUBLESHOOTING!



# TROUBLESHOOTING!

CTRL-ALT-I in browser for a-frame debugging

SHIFT-CTRL-J in browser for Chrome/FireFox debugging

CTRL-O in browser to load a file