

# Firework Simulation

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# Idea Description

- ▶ For my final I want to create a fireworks simulation. I plan on rendering a scene with multiple fireworks that the user can interact with. Each firework contains a different particle animation. Every particle animation will have their own variants of colors interpolating. I want this to be an interactive scene by allowing the user to pick their firework and click on the one he wants to ignite.

# Software

- ▶ I will be using WebGL alongside Three.js.

# Stretch Goal

- ▶ A stretch goal would be to also include a way for the user to customize his firework creating his own particle animations at runtime. I've seen some of these examples using three.js in which they have a GUI interface that the user can interact with. ex : Particle lifespan, radius, color range, speed and so on. Essentially each firework has its own customizable particle system.
- ▶ If everything gets done sooner, another stretch goal would be to make the particles form shapes when exploding. This is something I would have to look into more in depth.

# Interesting Points:

- ▶ Dynamic Object animations
- ▶ Dynamic Particle animations
- ▶ Dynamic Color interpolation

# Project Weekly Breakdown Part 1

- ▶ Week 1: Setup
  - ▶ Creating Scene
  - ▶ Setting Camera
  - ▶ Populate Scene
- ▶ Week 2: Interpolation
  - ▶ Create object movement interpolation
  - ▶ Set up parameters for dynamic object traveling. 'Stretch goal'
  - ▶ Set camera to follow relative to the object's (firework's) position.
  - ▶ Familiarizing myself with Three.js particles.
  - ▶ Create Static particle systems

# Project Weekly Breakdown Part 2

- ▶ Week 3: Particle System
  - ▶ Set up first particle system
    - ▶ Create parameters for dynamic particle system.
    - ▶ Change Color interpolation.
  - ▶ Create different variations for each firework. How many different variations I create depend on how intricate each firework is.
- ▶ Week 4: Interface and User Interactions
- ▶ Create GUI
  - ▶ Parameters for Firework travel path
  - ▶ Parameters for Firework particles
  - ▶ Create a reset method in order to fill more firework rockets into the scene.
- ▶ Allow for Mouse ray casting events for user input.
  - ▶ User can Click on any of the preset firework
- ▶ Allow for camera control at all times.
  - ▶ Clamp camera transforms and rotations

# Project Weekly Breakdown Part 3

- ▶ Week 5: Final Touches and Presentations:
  - ▶ Bug Fixes and Code Polishing
  - ▶ Final Presentation Notes and PowerPoint.