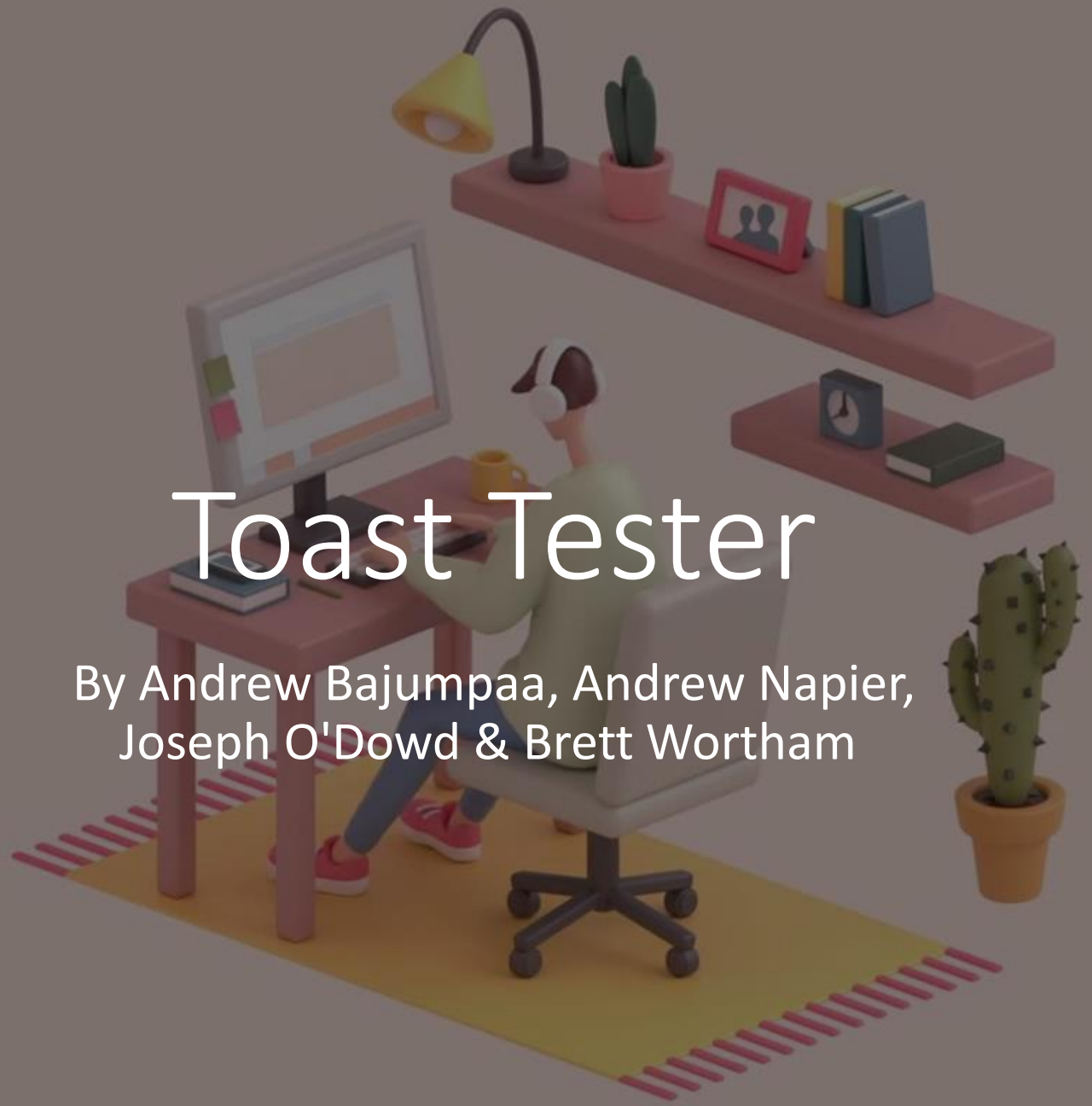


Toast Tester

By Andrew Bajumpaa, Andrew Napier, Joseph O'Dowd & Brett Wortham

Project Summary - "Setting the Scene"

The user controls our hungry *Toast Tester* ™

The user finds themselves in a kitchen with a toaster and some bread

Time to make some toast!

Project Summary - "Setting the Scene"

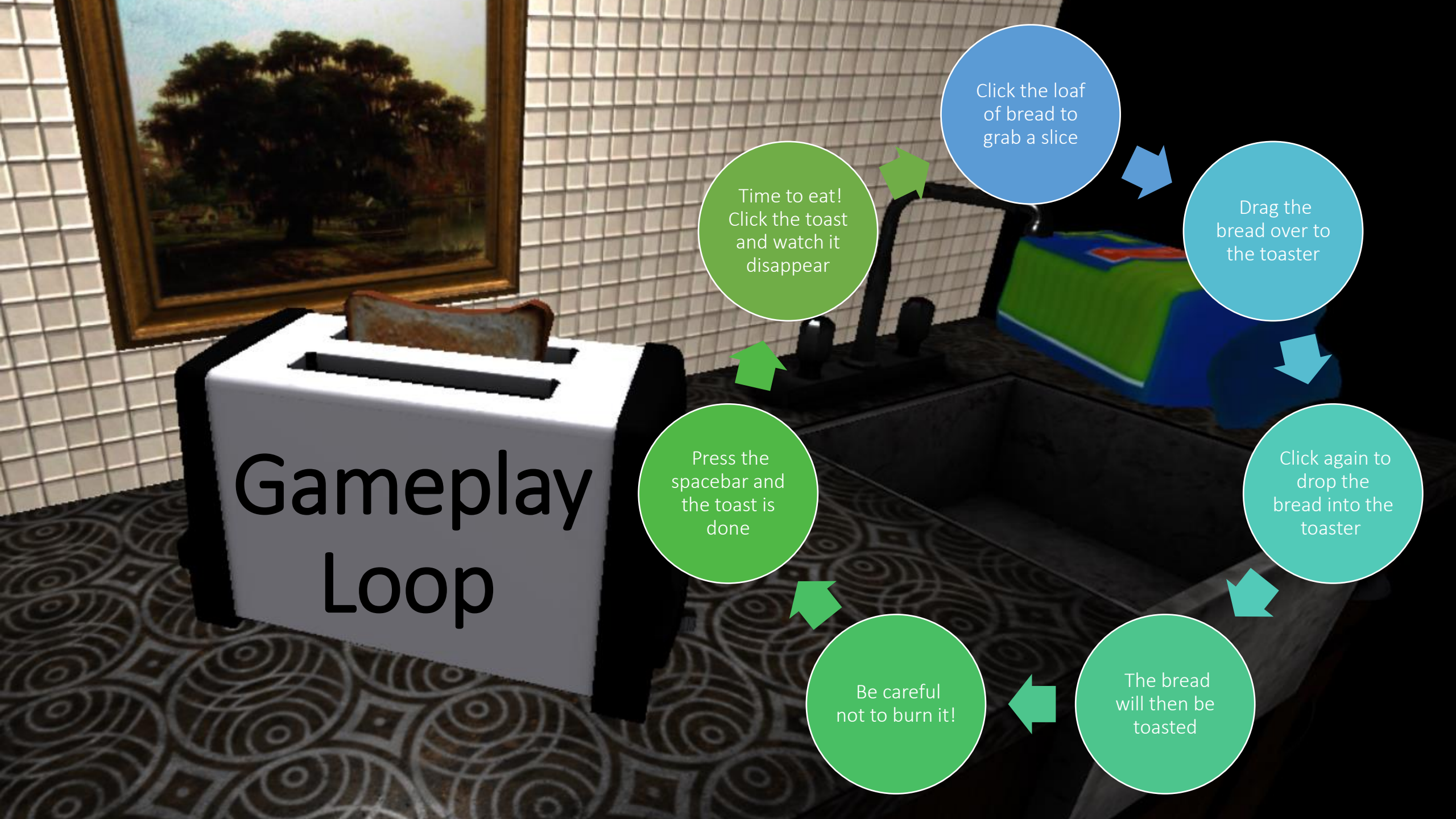
- ***Jam*-packed toaster action!**
- The user can grab a piece of bread from the loaf and put it directly into the toaster.
- Models used include:
  - Kitchen w/ counter
  - Tiled wall
  - Loaf of bread
  - A toaster
  - Toast / bread (single slice)
  - Painting
- The bread will descend into the toaster and toast will **spectacularly** pop out when the user hits the spacebar.

Models Used

- Links to models:
  - https://sketchfab.com/3d-models/toast-ed8689dad919448bb78cd696725e12c5
  - https://sketchfab.com/3d-models/toaster-68a31a8eb07d4b84aeb3b13484d4c9e8
  - https://sketchfab.com/3d-models/tileable-subway-wall-378849b0e72147c3b9267cf39dd25046#download
  - https://sketchfab.com/3d-models/kitchen-counter-e46deaab889548948a31e4264de61e5a
  - https://sketchfab.com/3d-models/enriched-bread-loaf-a9d155a0a115404ab8822b15c8f91726
  - https://sketchfab.com/3d-models/painting-lowpoly-241c0b04a3364a1fac1d4fe656a3956b

Audio Used

- https://freesound.org/people/nigelcoop/sounds/210513/
- https://freesound.org/people/gregstermatic/sounds/336676/
- https://freesound.org/people/Rudmer_Rotteveel/sounds/364924/
- https://freesound.org/people/ihitokage/sounds/395328/
- https://freesound.org/people/Anthousai/sounds/447847/
- https://freesound.org/people/nikosardas/sounds/456797
- https://freesound.org/people/knufds/sounds/490323/
- https://freesound.org/people/magnuswaker/sounds/540790/

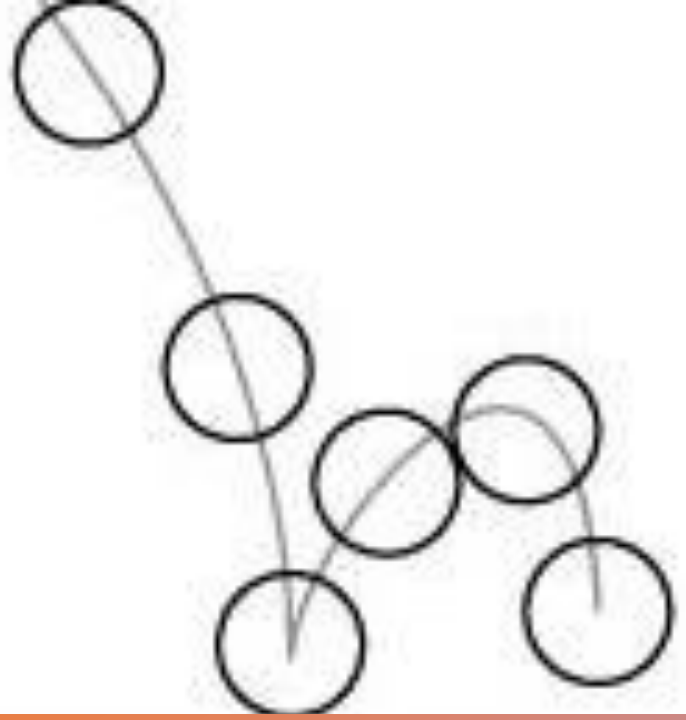

Gameplay Loop
Click the loaf of bread to grab a slice
Drag the bread over to the toaster
Click again to drop the bread into the toaster
The bread will then be toasted
Be careful not to burn it!
Press the spacebar and the toast is done
Time to eat! Click the toast and watch it disappear

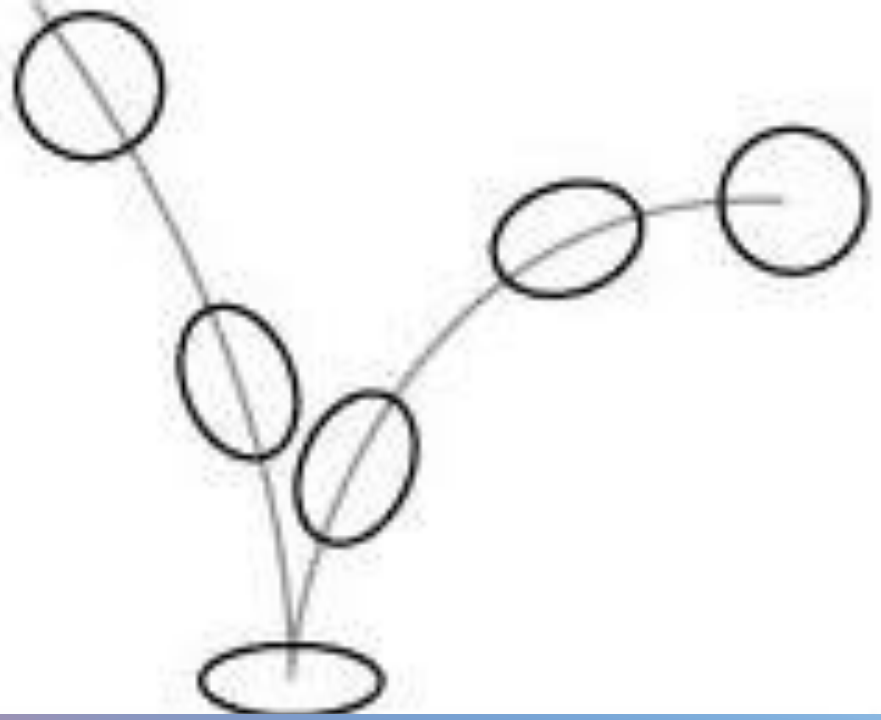
Toast Insertion

- A ray from the camera determines whether the user has clicked on the loaf of bread.
- Given this, the toast is dragged along an invisible plane with more ray tests.
- While the toast is above the toaster, clicking again calculates Bezier curves for its position and rotation into the toaster.
- The next stage commences when the animation ends.

The Toaster Glow

- The toaster emits light while it is on
  - We placed a PointLight inside the toaster
  - The object is rendered when the toaster is on
  - Lighting of the scene will be calculated according to this change





Squash and Stretch

- The toaster is deformed during motion

- We achieve this by applying a Bézier curve to the toaster's position and scale properties

Who Burnt the Toast?

- The toast uses a uniform to become burnt.
- Using GLSL injected before the fragment shader's compilation, the toast textures are interpolated and multiplied against the diffuse color.
  - This permits us to use the nice lighting Three.js comes with.
- Using another custom fragment shader, the smoke is a plane that always faces the camera.
  - The toast's burn level is passed as a uniform to determine how much smoke is produced.
  - A smoke alarm plays after the burn level passes a threshold.

Techniques Involved in the Toast Pop

- For the toast popping out of the toaster we use a **Bezier curve** to define its path.
- The toast will have the following transformations applied:
  - **Translation:** Upwards, as it flies out of the toaster.
  - **Rotation:** Some random direction. It's more realistic to have the toast rotate when it's propelled high into the air.

Crumby Consumption

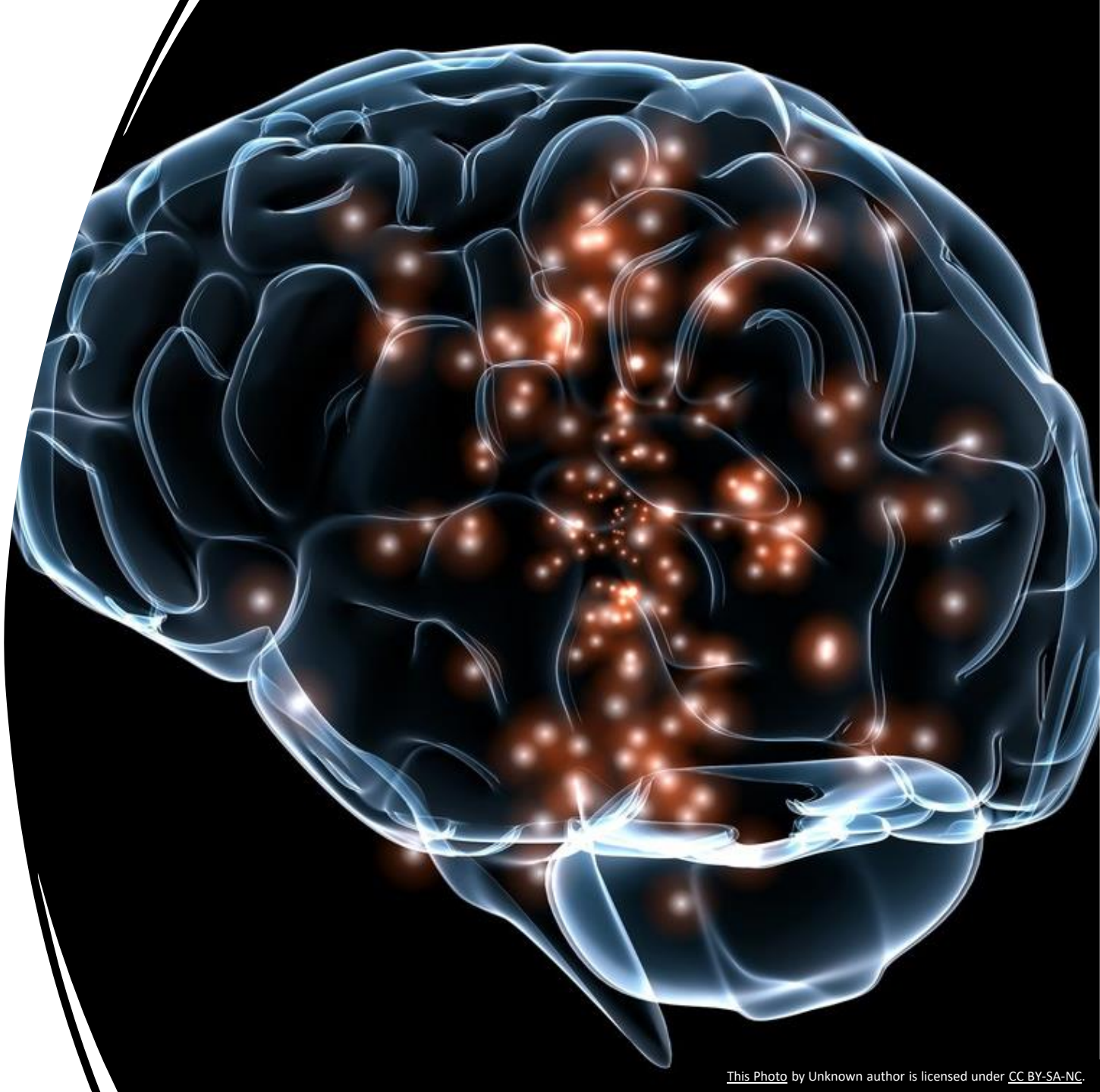
- The toast itself uses two CanvasTextures; this allows texture modification.
- The toast model is made transparent once placed on the counter; this enables the bite effect.
  - The render order must be defined for other transparent objects (such as the mouse plane and smoke) so that they don't clip the toast.
- With a mouse click, a ray from the camera finds the mouse's position in terms of the texture's UV.
  - If the pixel has no opacity, a sound is played to indicate failure.
  - If the pixel is filled, a circle is erased from both textures.
- Crumbs are scattered with draws to another CanvasTexture on the countertop.
- Many native libraries allow you to render to textures, and this is the closest equivalent in Three.js.

Demo

https://codepen.io/cis45404/project/live/DyKeRe

References

- Three.js documentation
- Fundamental concepts from lectures
- Prior knowledge
- Prior experience with toasters



Group Work Time & Contribution

The group worked on this presentation collaboratively and equally at the following times:

10:45-10:55, 12:15-12:25 on Tuesday 11/7

2:00-3:00 on Wednesday 11/8

1:00-2:00 on Monday 12/4