Part C

Jolina Lam

Steam Simulation Shader

One effect I thought would be interesting to create through a shader is steam simulation, as seen in the image above. From a quick glance, it looks like a smoke simulation shader. However, a few parameters need to be changed so that it doesn't look like smoke from a fire. In order to get a real-time steam waft effect for hot food, it needs to originate from a surface, not just a point. Steam is evaporating water, so it's color should change from semi-transparent white to completely transparent over time. Steam does not travel far from its source, so the color change should be relatively quick to depict a short "lifetime". The very end of steam's "lifetime" is where a quick color change should be applied. It is also sensitive to air displacement, so applying a slight turbulence to make it wave will make it look more natural. Steam itself is quite turbulent, but its collective movement is only slightly turbulent.

To apply this as a GLSL shader, I can see it as mix of an off-white square or cube with a perlin noise texture applied to it. Another texture can be added to control the area at which the steam can be seen. It would be reliant on a time change (THREE.Clock) so that it can move in realtime. The time change will also affect the transparency of the steam as it gets more transparent the longer it has been on the screen. Some sort of diffuse would be applied so that hard lines from shapes are not as prominent and the steam looks more ethereal. Either the diffuse will need to move the texture up or the perlin noise texture will need to move up to make it look like the steam is rising. The turbulent movement can either be caused by perlin noise or a velocity grid which tells the steam what path to "follow" as it rises.