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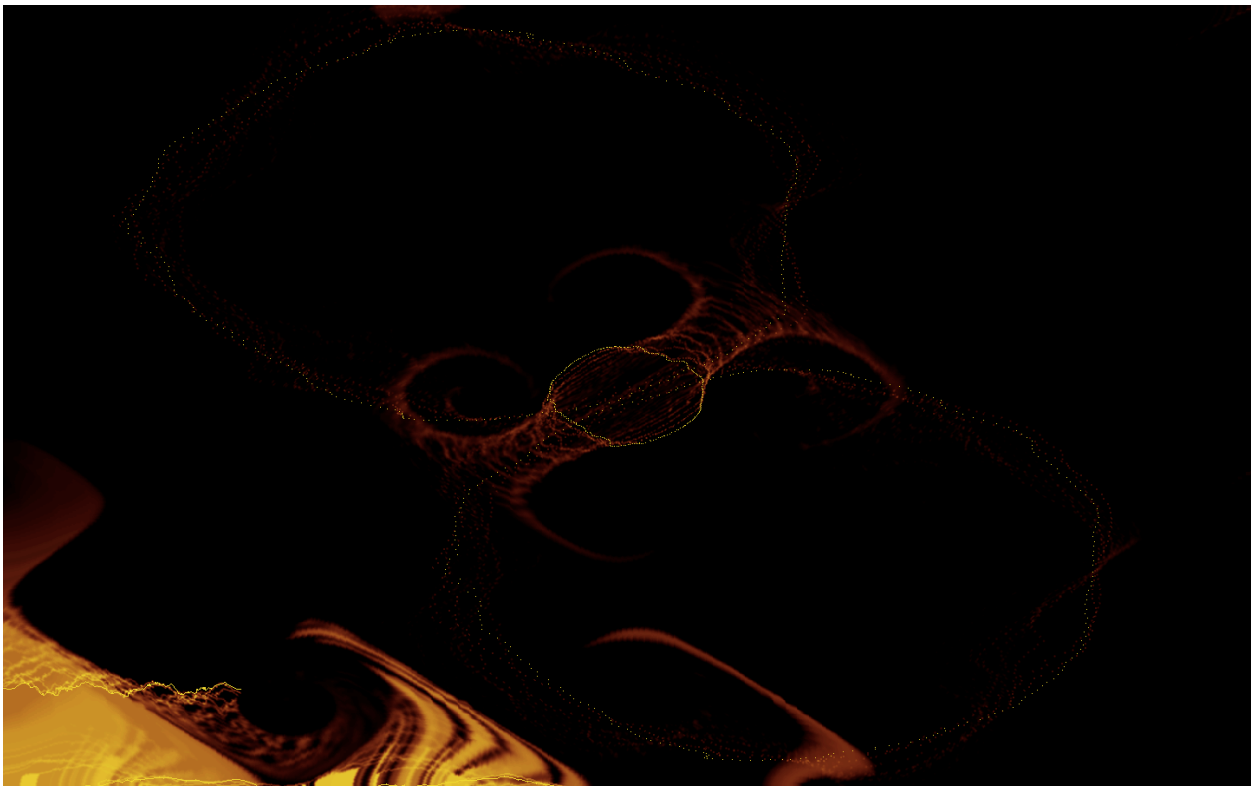
Part B

For my piece of the final project I'm considering investigating smoke/steam effects. I think particle systems are cool, but the low frame rate on my simple hw3 snow effect leads me to believe that getting them to scale (handle lots of small particles) and retain adequate performance takes more than a little fiddling with the default settings. I don't yet know anything about how to simulate actual fluid dynamics so that the particles repel each other and produce the billowing seen in the image below, and understanding how to implement this in a program like Unity could be both useful and interesting.

(Chianti - https://en.wikipedia.org/wiki/Steam_locomotive#/media/File:41018_Schiefe_Ebene_Nov_5_2016.png)

If this type of effect is too advanced for me using just a standard particle system, or if it's not feasible to render billowing smoke/steam without using pre-generated textures, there are still several things I could do with a better understanding of particle systems. I could try to simulate magic trails by putting particles behind moving objects, or I could try to use particles for animations or as a reaction to game events; these projects could both be relevant to audio visualizers, which my prospective teammates have expressed an interest in making. As a very rough example of what I mean by an audio visualizer, here's a screenshot I took of the iTunes classic visualizer. The waveform on the bottom left would kind of be the starting point for a visualizer project.



As for how I'll actually implement this in Unity, it'll really depend on which pipeline we end up using. The HDRP and VFX graph sounds super cool and would probably allow me to make much more realistic effects, but we haven't yet discussed which option we're going with so I might have to make do with the default pipeline if everyone else wants to stick with what's familiar. In that case I can probably make at least a decent smoke/steam simulation in the default system, and I'll probably use the default system for a visualizer either way, at least to start out. Shader Graph and VFX Graph sounds very attractive to me right now, but I'll have to see what the others' ideas are when we meet on Tuesday. There's also the issue of my computer not being very powerful, but I might be able to compensate with the lab computers if necessary.