Physically Based Smoke Simulation and Behavior for Mixed Reality

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The aim of this dissertation is to simulate physically accurate smoke behavior that can perform on mixed reality headsets like the Microsoft HoloLens. The final goal being a simulation that can interact with the surrounding real life environment along with other virtual objects that can potentially be located within the environment. This consists of multiple areas beginning with a physical simulation using an approximation algorithm combined with forces relevant to smoke fluid simulation. Combining this with the spatial mapping data from the HoloLens as a base environment It is possible to develop interactions between the particles within the simulation with the real world ultimately creating a mixed reality experience. However this isn't simply enough as the simulation must also operate smoothly on a mixed reality headset which takes into account it's restriction resulting in a focus on optimization and alteration to achieve the designated goals.

Video: https://youtu.be/u4X5CyMkxx8