Super Powered LEGO - Brick Spawners

Maximilian David
s1madavi 1349951
maximilian.david@uni–bayreuth.de

December 12, 2022

One major flaw of the real-life LEGO experience is the limited supply of bricks. Therefore, the first step towards building LEGO structures with superpowers was the introduction of an unlimited brick supply. Firstly, all existing bricks were removed from the scene and exchanged for a single brick of their respective type. These bricks will act as spawners and have a neutral color since a future goal will be to introduce a tool for brick coloration. The combination of these tools will remove the search time for specific brick colors and thus help users to accomplish their goals much faster.

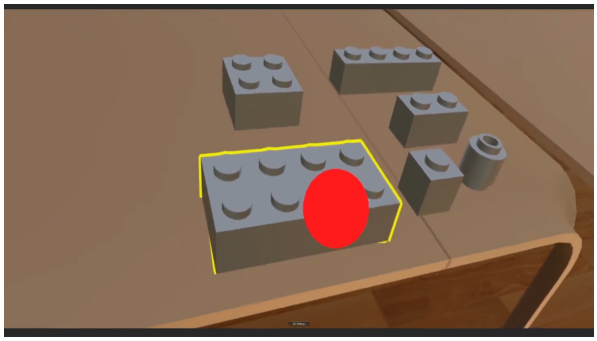

Figure 1: Brick spawners

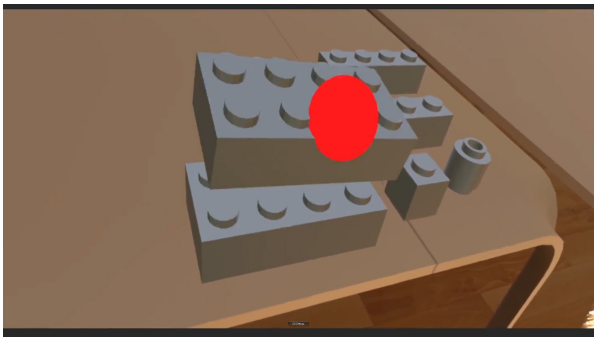

Figure 2: Brick after cloning

At first, these new spawner bricks were meant to create a new brick game object whenever the users were to grab one of them. The newly instantiated object should then be attached to the hand and behave as all bricks did before this change. However, attaching the newly instantiated brick by code to the user's hand caused a few problems. Firstly, the brick would often start glitching and move almost randomly around the scene and secondly, the currently held brick would not be dropped whenever the user stopped pressing the trigger or squeezing the controller. Fixing these issues seemed needlessly complicated and a different approach to creating new bricks was chosen instead.

Whenever a brick is picked up by the user for the first time, a copy of it is created at the brick's original starting position. This provides the functionality of a brick spawner simply and easily, without a lot of overhead. While this approach worked great in all relevant aspects, a new bug manifested itself.

Every brick created by the new spawning mechanic stuck to the user's hand and could not be dropped anymore. An extensive search for the cause of this bug revealed SteamVR's "Complex Interactable" script as the culprit. This script is a remnant from a prior version of this software and is responsible for complex physical interactions between held objects and the environment. Since held objects are no longer influenced by physics in any way, this script serves no purpose anymore and was removed from every brick. The removal of the "Complex Interactable" fixed the game breaking bug and marked the completion of the brick spawning feature.

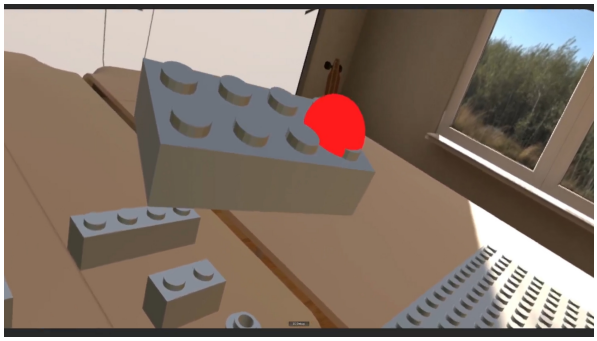

Figure 3: User holding cloned brick

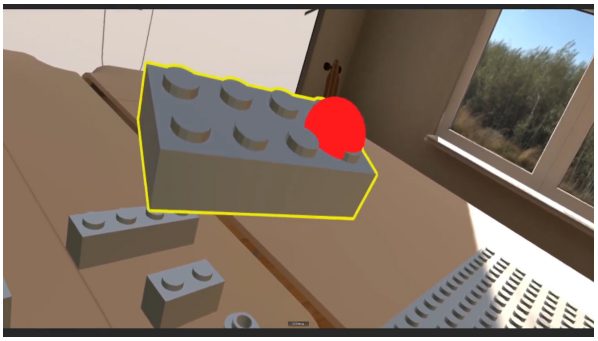

Figure 4: Brick stuck to hand

With the brick spawners in place, a way of removing unnecessary and unwanted bricks needed to be implemented. The real-life clone version of the VR LEGO builder utilizes the down button on the directional pad as a way to restore all unsnapped bricks to their original position. Therefore, the button was perfect to be used for the removal of all excess bricks. Whenever the user presses this button, all bricks that are not snapped into the grid, or are not currently at their starting positions (the spawners), are deleted. This feature gives the users an option to clean up all loose bricks across both VR settings whilst still keeping the user's mental model consistent.

With all the presented problems solved, the implementation of the brick spawners is completed, leaving the feature of coloring the bricks as the next step.