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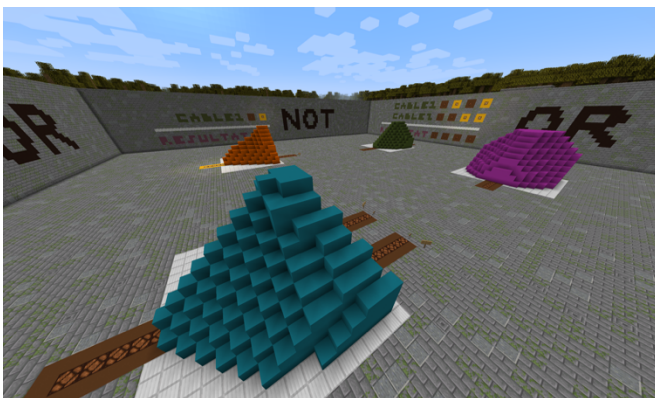Spring Semester 2021   Research Project: LogiCraft

LogiCraft:
An Educational Game in Minecraft

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MOTIVATION

LogiCraft is an educational game in Minecraft which introduces the notion of logic gates to children. Being something that hides behind every piece of computer and electric engineering, logic gates form a great introductory tool for children to the world of engineering. Additionally, their mode of operation is based on Boolean algebra - a fundamental mathematical concept which is usually not taught in primary and secondary schools in Switzerland.

The goal of this project is to create a video game, which presents and teaches mathematics in a fun and interactive way, and which can be taught in the context of an outreach program. The idea behind it being to do something fun with students, all whilst educating them on an essential mathematical concept.

METHODS

The final game consists of 10 different puzzle-like quizzes, which come in in three different levels. It also includes an introductory tutorial level, and the entirety of the game is put into frame by a narrative which gives the player a goal and a reason to finish the game. To optimize the effect of the game, a lot of thought has been put in the structure and narrative before starting to create the game.

RESULTS

With the results of the testing phase, it is difficult to say whether the game has an impact on the participants' understanding of logic gates, and if they have improved their knowledge in that field after having played the game. This is due to the small range of the testing that has been done because of time reasons. However, looking at the results of the survey, the game seems fun and entertaining. All of the participants rated the fun-factor of the game above average, and most of the participants liked the storytelling a lot.

The game is not complete at this stage. There is still room for improvement, for example for the in-game explanations of the game. It is a first draft of the final game which can, in a later step, be used in outreach program.

Link to the code repo and report: https://github.com/ftrinca/logicraft