Fall Semester 2021 Research Project: Cellulo

Design of a human interaction activity with Cellulo-MORI

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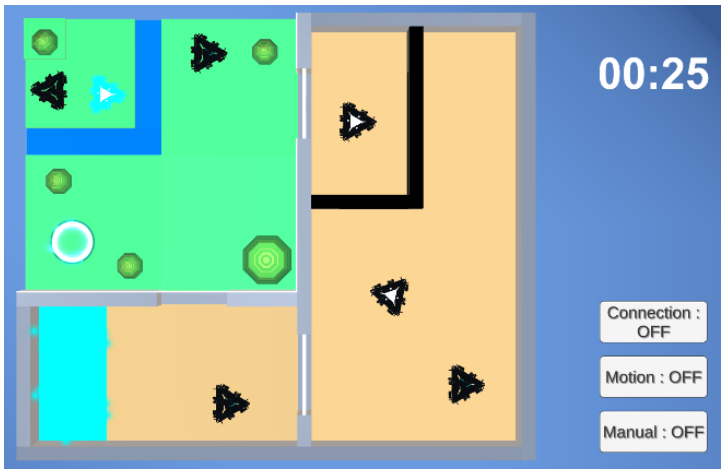
MOTIVATION

The purpose of this work was to design a learning activity on emergence using *Cellulos* and *Moris*, robots, either developed at CHILI or RRL. The **emergence** is the ability of multiple elements to develop a property or an order that they don't have on their own (e.g. the organisation of an ant colony or arrangement of atoms in a solid).

Altogether, we seeked to create a simulation which lets the user discover what the emergence is by using our robots: to have a common goal that you can only achieve by joint efforts of all robots or users which are taking part in the simulation.



METHODS

The goal of this project is to develop an activity/simulation in Unity that involves *Cellulos*, *Moris* and *Cellulo-Moris*. The challenge is to identify and make the most out of these robots' strengths and weaknesses.

The project is split into two main parts. The physics part that aims to have the most realistic behaviour of robots in the simulation possible. Whereas the User Interface part aims to develop features that eases control of the robots as well as mechanics that make the activity work properly. These two parts are often merged to keep the project updated.

RESULTS

We end up creating an activity where the goal is to save a color trapped on an island by bringing it to the final zone. To do so, the player has to pass the color from a robot to another by connecting them. Other mechanics like gems collection are required to complete the activity. We designed and preliminarily validated a learning activity on emergent behaviours.

ode repo: https://github.com/DeepGreen1/cellulo-mori
Report repo: https://github.com/Brontor/Master-Project