CS 251 Project Report
Fire Extinguisher
Group 30 - Hackstreet Boys

Sanat Anand - 140040005
Siddhant Garg - 14D070027
Ritwick Chaudhry - 14D070063

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Aim and Major features

Aim - This project aims to create a simulation of a Rube-Goldberg machine which extinguishes a fire using the Box2d physics engine for C++.

Major Features:

- Fire-extinguisher model
- Water conservation model
- Gate mechanism
- Air-pump

Basic control flow (First part)

The Rube Goldberg simulation starts off with water falling off a dam. Here we will be using small droplets of water instead of using a continuous vessel full of water. As a result, the water droplets will fall down through the pipe and will hit the blades of the turbines. The water then gets collected in a tub placed below the turbine. Water falling on the turbine will result in the turbine rotating and thereby making the above pulley rotate along with it. This will lift the bar at the other end of the pulley and allow the ball blocked by it to fall. This ball would fall and push the air-pump piston. This causes the balloon attached to the pump to get filled and rise up. As the balloon rises, it pushes one side of the see-saw thereby causing the ball resting on the see-saw to fall onto the set of planks. Beyond that, the balloon also goes further up and does the same with another see-saw situated higher up.

Control flow (Second part)

As the ball on the lower see-saw falls down and moves to the right of the plank, it pushes the vertical plank which causes the plank to in turn push the ball present on the lower plank. This continues till the last ball finally drops and leaves the plank. This ball then falls and topples a stack of dominoes, the last of which falls in an open box connected to a pulley. At the other end of the pulley, a plank rises and hits a see-saw which releases another ball which falls in another open box. This pushes down this open box and lifts the gate connected to this box with a pulley joint. The ball on the higher see-saw topples some dominoes which hit another ball which falls down and hits a revolving plank. This revolving plank pushes the tub filled with water to the right towards the elevator. This ball then falls down, passes through the opened gate and pushes a glass full of water which causes the fire to get extinguished. Meanwhile, the elevato shaft carries the tub filled with water and places it back in the dam.

Full project screen-shot

This is a scrrenshot of the final project when the simulation starts: