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CS 4590

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SKATEBOARDING SIMULATOR

User Manual

Visual of the Simulator

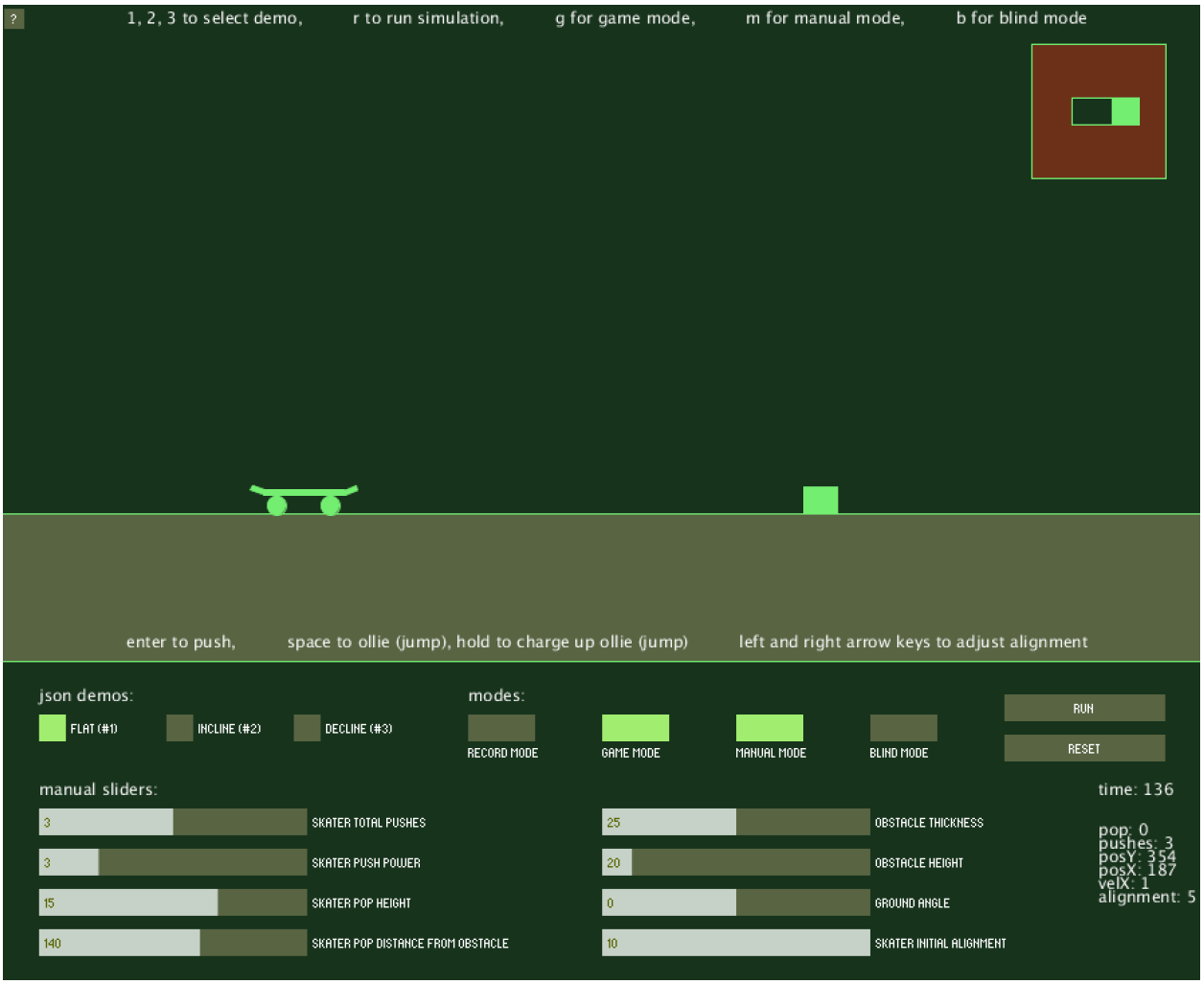


Figure 0: simulator in manual mode view

from top left to bottom right: help toggle, help text, alignment mini map, side scrolling visualizer, UI buttons, manual mode sliders, debug text

Adjustable Data Points

These data points can be adjusted in slider mode, or by creating custom JSON files to load with the simulator:

- Skater Data
    - Skater Total Pushes
    - Skater Push Power
    - Skater Pop Height
    - Skater Pop Distance from Obstacle
    - Skater Initial Alignment
- Environment Data
    - Obstacle Thickness
    - Obstacle Height
    - Ground Angle

Sonification Scheme

- Skater Y height by pitch of constant sound
- Skater X position / distance from optimal popping position from (sonified by a beeping sound that increases in speed)
- TTS that reports back if the attempt was successful or unsuccessful
- Pushing sound on each push, pop sound effect on pop, land effect on land
- Left to right panning of the sonification based on the alignment of the skater (mini map in the top right)

Simulator Scenarios

The general goal of the simulator is to showcase a well popped ollie over an object. The simulator allows for adjustment of many variables, in order to influence the environment and the skateboarding of the skater. The user interface features a side scrolling view of the skater moving towards the object. Below this view, there are user interface elements for all the options available in the simulator. Additionally, all the buttons can be controlled via keyboard input. In the top right, a mini map can be found to show the forward-facing view from the board. This mini map allows for alignment of the skater, to make sure the board is straight on with the object. The overall goal is to push to get enough speed, keep the board aligned with the obstacle, and pop both at the correct time and with the correct power to clear the object, in order to achieve a successful ollie.

JSON #1 - flat

This JSON file showcases an example of a flat scenario. This is also the default scenario. This scenario has a flat ground, with no incline, three pushes, and a normal pop height and pop positioning. The board pops over the obstacle with relative ease and normal speed. This file can be loaded with the button on the UI, or with the “1” key on the keyboard.

JSON #2 - incline

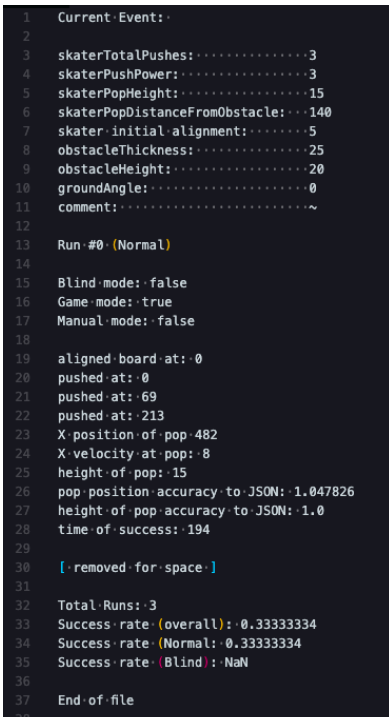
This JSON file showcases an example of an uphill scenario. This scenario is more difficult, because it requires more precise pushing power due to incline gravity and drag and has a tighter window to pop over the obstacle. This file can be loaded with the button on the UI, or with the “2” key on the keyboard.

JSON #3 - decline

The last JSON file showcases an example of a downhill scenario. This scenario requires less pushing power, as there is less drag against the skater. However, the board rolls pretty fast, so the skater has to pop earlier to compensate for the arc of the pop and the speed. This file can be loaded with the button on the UI, or with the "3" key on the keyboard.

Record Mode

This mode allows for user testing. This mode will track almost all data relevant to a user test and save them to a text file under the "results" folder of the project. The text files for each enabling and disabling of the recording are named by number. Recording mode is enabled using the "TAB" key on the keyboard, or the button on the UI. Note: recording mode will disable switching JSON files, and enabling/disabling manual mode. This is to keep recording data accurate, as the mode records for one data set at a time, whether loaded by JSON or inputted manually with sliders in manual mode.



```
Current Event:

skaterTotalPushes:              3
skaterPushPower:                3
skaterPopHeight:                15
skaterPopDistanceFromObstacle:  140
skater initial alignment:       5
obstacleThickness:              25
obstacleHeight:                 20
groundAngle:                    0
comment:                        ~

Run #0 (Normal)

Blind mode: false
Game mode: true
Manual mode: false

aligned board at: 0
pushed at: 0
pushed at: 69
pushed at: 213
X position of pop 482
X velocity at pop: 8
height of pop: 15
pop position accuracy to JSON: 1.047826
height of pop accuracy to JSON: 1.0
time of success: 194

[ removed for space ]

Total Runs: 3
Success rate (overall): 0.33333334
Success rate (Normal: 0.33333334
Success rate (Blind): NaN

End of file
```

Figure 1: example of recording output

Game Mode

Game mode allows for user input of the keyboard to control the skater pushes and pop. This is used in conjunction with record mode to allow for user testing. The player can use the *ENTER* key to push, and the *SPACE* key to pop the board. The *LEFT* and *RIGHT* arrow keys will allow the user to adjust the alignment into the alignment box. The user cannot push while in the air and

cannot pop while pushing. To pop higher, the user must hold space on the keyboard, in order to "charge up" the pop, and pop higher to clear the obstacle. This is to simulate bending down the legs on a real skateboard. Additionally, the user must align the board manually with the obstacle, using the mini map in the top right corner. This is to simulate forward view of the skater, in order to line up with the obstacle correctly.

Manual Mode

Manual mode allows for custom simulations not given in preset JSON files. By enabling manual mode, the UI reveals a new section of sliders that allow for complete customization of the simulation. Additionally, the UI will show some real-time debugging data for more information. Note: manual mode cannot be enabled or disabled while in recording mode, the option will be greyed out, and the sliders will be locked until recording mode is disabled.

Blind Mode

Blind mode hides visual data from the user, in order to allow for sonification testing. This mode requires the user to rely only on the sonification of the data to make successful attempts at the simulation.