

This is a simulation that places the participant wearing an Oculus Rift in a room (customizable with an input file) and records all head movements to an output file.

## Buttons

- Spacebar: Load next set of variables and build new room
- Escape: Quit sim

## The Input File

The Input file, “input.csv”, allows you to modify the world with 26 editable variables and values. Every time the spacebar is hit in the sim, the next 26 variables in the file will be loaded to create a new scene. You can have a virtually infinite number of scenes to be loaded in.

If the input file is missing, it will load a default room and still record data

The variables and the order they appear in are as follows:

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[Oculus Camera Position X],[Y],[Z],[Oculus Camera Rotation X],[Y],[Z],

[Red Cube Object Position X],[Y],[Z], [Red Cube Object Rotation X],[Y],[Z],

[Floor Material (See Below)], [Ceiling Material], [Wall Material], [Wall Angle]

[Is Offset Screen Active(True/False)], [Offset Camera Position X],[Y],[Z], [Offset Camera Rotation X],[Y],[Z],

[Is X Inverted (True/False)], [Y Inverted], [Z Inverted]

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- Editing the Input File – “input.csv”
  - Input file can be opened in Notepad, TextEdit, or similar program. Just be sure a comma (,) separates all values entered
  - Input file can also be opened in Microsoft Excel as a spreadsheet.
    - Be sure to save file as a .csv
    - By coincidence, there are exactly 26 variables. Excel will label columns by the letters of the alphabet, so all columns A-Z should be filled for every set of values.
    - Close Excel before running the test. Excel will not let the Sim access the input file while it has the file open. (Files opened in Notepad will not have this problem)
  - Variables should only occupy the first line/row. Every 26 columns in that row will represent a different group. This would probably be easier to read if each group were its own row, but my lack of Input/Output programming experience is to blame. A better programmer could probably fix this easily if desired.
- Position/Rotation
  - All XYZ position and rotation values can be any decimal number. (Ex: 2, 375, 0.75)
  - Position 0,0,0 is the absolute center of the room.
  - Z+ is Forward, Z- is Backward, X+ is Right, X- is Left, Y+ is Up, Y- is Down.
  - Walls are positioned 10 units away from the center. Ceiling and Floor are 5 away.

- (The *center* of the wall is at 10. Wall thickness moves out .5 units from there and numbers too close to 10 may put the object inside the wall.)
  - After the sim starts, the real-world position of the Oculus will overwrite any change to the Oculus Camera's rotation. So only the rotation values of the very first set of values will work to offset the rotation.
- Floor/Ceiling/Wall Material
  - Must be an integer between 0 and 5 inclusive.
    - 0: White
    - 1: Black
    - 2: Checker Pattern
    - 3: Vertical Lines
    - 4: Denser Checker Pattern
    - 5: Denser Vertical Lines
    - If an invalid number is entered, it may cause problems
  - Floor, Ceiling, and Walls can be assigned different materials, however all 4 walls will be the same material
- Wall Angle
  - Rotates the walls. 0 leaves them straight up. Positive numbers will rotate them outward, negative will rotate them inward.
  - If the walls are flattened outward (exactly 90) the ceiling will vanish making the room become an outdoor plane.
- Offset Screen Active?
  - Must be True or False. Does not seem to be case-sensitive.
  - If true, a screen will appear in front of the Oculus Camera showing the display of another camera
  - Image quality may be reduced while looking through the other screen. Especially during rapid head movements.
  - Suggestion: If the offset screen is active, you may want to position the Oculus Camera outside the room (Example: 0,-15,0) to prevent it from "Seeing itself" through the offset camera
  - The Offset Camera will mimic the rotation of the Oculus
- Inverted?
  - All X,Y,Z Inverted variables are True/False.
  - If True, the Offset Camera will rotate in the opposite direction of the Oculus along that axis.
    - If X is inverted, looking up and down will be switched
    - If Y is inverted, looking left and right will be switched
    - If Z is inverted, tilting the head left and right will be switched

## The Output File

- "output (#).csv"
- Suggest opening file in Excel for readability.

- The output file will record the time, in seconds, since the sim was started and the XYZ position and rotation of the Oculus Camera every single frame.
- It will also note of when the spacebar is pressed to tell the sim to create a new room
  - There is currently nothing to detect if there is data available to build the room from. It will note in the output when it is attempting to build a room, not if it is successful. If nothing on the screen changes, assume it has reached the end of the input.csv file.
- While the Input file needs to exist in the same folder as the sim before starting, the output file will automatically be created when the test starts, if it is there or not.
- Output files are assigned numbers to avoid accidentally overwriting output files from previous tests. They will be given the lowest available number after checking the output files that already exist in the sim's folder.