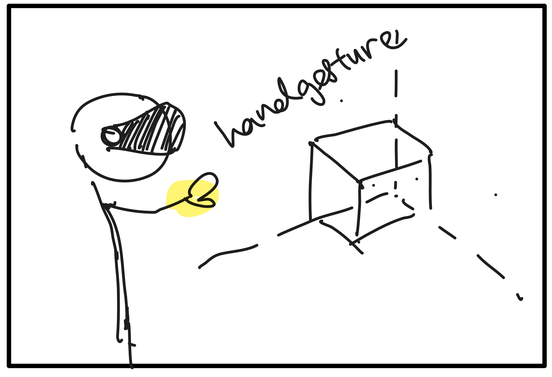

“Build by Motion”

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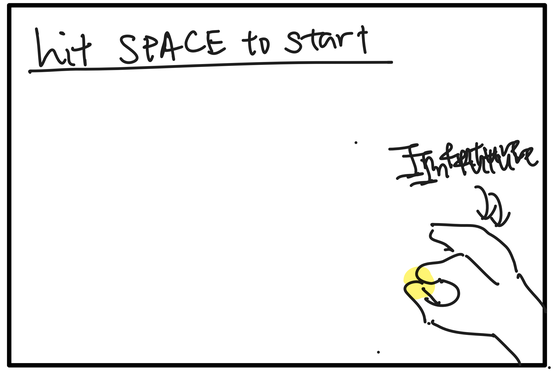
Date: 6/12/2024
Term project for 15112 @ CMU

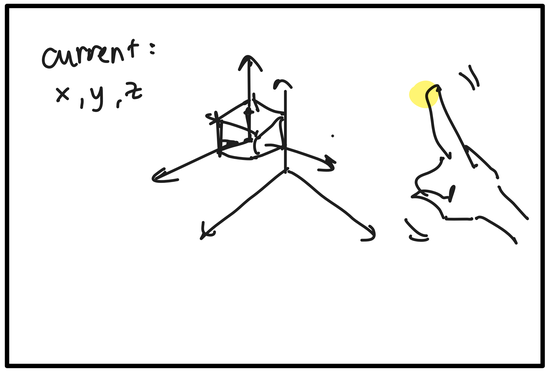
Inspiration:

This application explores the potential of using body gestures to build, draw, and create geometric patterns. It is an experiment—a brief demo or prototype—to test the experience of controlling building blocks with hand gestures. Currently, the gestures are limited to moving cells.
In my ultimate vision, this project will operate within VR, XR, or MR environments, turning it into an immersive game or creative tool.
To simplify the creation of complex patterns, I’ve implemented features that allow users to use basic actions or methods to visualize intricate designs. For example, users can import images to generate patterns, draw their own designs, or use subdivision (subd) techniques.
A key highlight of this project is successfully visualizing 3D objects and their subd representations on a 2D screen.



1. Start page

Hit SPACE or use a gesture (currently SPACE only) to begin.



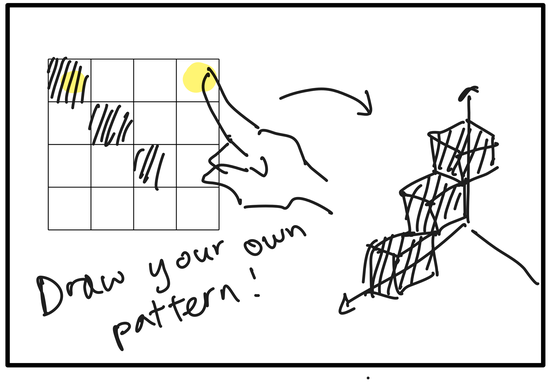
2. Build page

Start constructing cells on a grid.

- Move the current cell: Use hand gestures.
  - Single finger: Move in X-Y directions.
  - Closed fingers: Move in the Z direction.
- Adjust the view: Use arrow keys and mouse to zoom in/out and rotate.
- Place a cell: Hit SPACE.
- Remove a cell: Hit X.
- Change cell type: Press keys 1–7.
- Modify grid size: Adjust to accommodate new cells.

Special Feature:

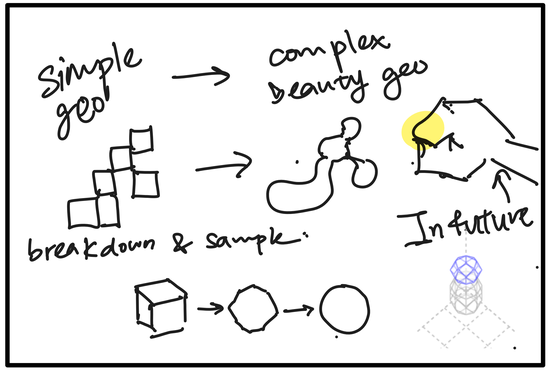
- Import an image and extract its edges as cells.



3. Special feature: customize piece

Hit the Draw icon to navigate to the Draw Page.
Draw your own pattern using hand gestures or by dragging the mouse.
Once done:

- Hit S to save.
- Hit E to export and return to the Build Page.



4. Finalize the pattern

After placing cells, you can toggle between edgy and rounded designs using subdivision:

- Press [/] to apply subd, can be increase or decrease.