

# Virtual Rolling Temple: Expanding the Vertical Input Space of a Smart Glasses Touchpad

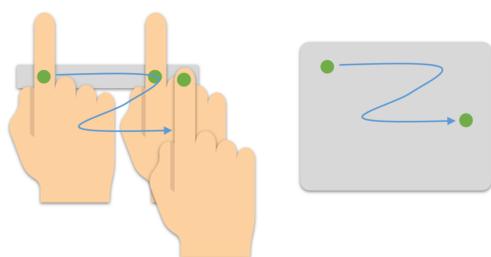
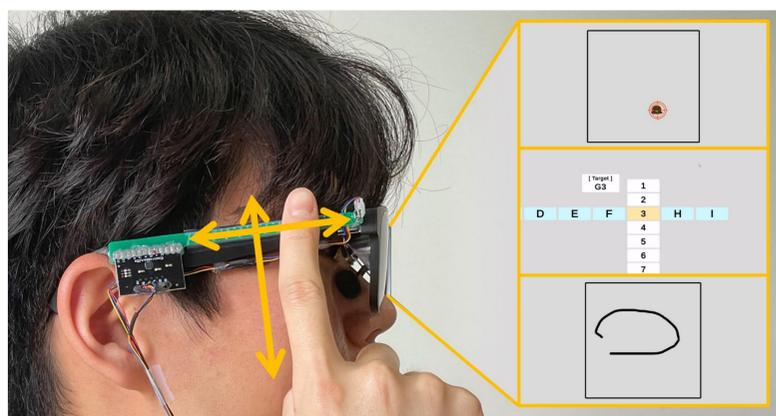
Kyunghwan Kim, Geehyuk Lee

Human Computer Interaction Lab (HCIL)

School of Computing, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

“ Why stick to horizontal 1D smart glasses GUI, if they can recognize 2D gesture inputs within its form factor? ”

## The Virtual Rolling Temple (VRT)



✓ Expands the **vertical input space to the finger's length without clutching!**

✓ Thereby better supports 2D GUI on smart glasses while **maintaining the form factor.**

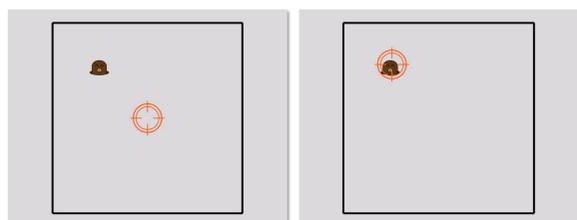
### How to Use?

✓ Perform 2D inputs by moving the hand in any direction **while keeping a finger or fingers on the temple**, as if the temple is a conceptual roller.

### Why 'Virtual' Rolling Temple?

✓ Due to technical and aesthetic constraints, the **conceptual roller was "virtually" implemented** utilizing touch and displacement sensors.

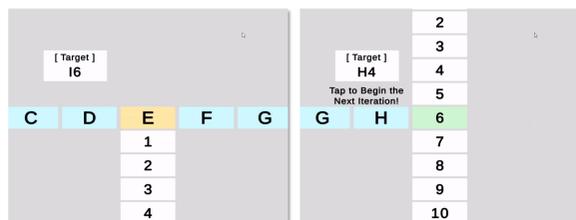
## Three Demo Scenarios - Representing General 2D Input for Smart Glasses



### [ 2D Pointing: Catch a Mole ]

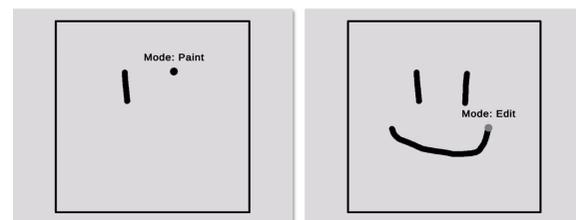
1. Navigate the cursor to the mole.
2. **Tap to catch!**
3. The mole will move to a random position, and the cursor will be restored to the center. Repeat :)

<b>Swipe</b>	For/Backward	Up/Down
<b>Cursor</b>	Right/Left	Up/Down



### [ 2D Menu: Two Hierarchies ]

1. Check the randomly selected target and **tap to begin.**
2. Scroll horizontally to navigate through categories and vertically to select among items.
3. Locate the target. **You may combine horizontal + vertical gestures into a single stroke.**
4. **Tap to select.** Repeat :)



### [ 2D Gesture: Paint ]

1. **Select mode with Two-finger Taps:** Move, Paint, and Edit.
2. **Move Mode:** One-finger gestures to move the brush.
3. **Paint Mode:** One-finger gestures to stroke along the trace of the brush.
4. **Edit Mode:** One-finger **horizontal swipe** to **undo/redo**; **vertical swipe** to **increase/decrease brush size.**
5. Repeat to draw the desired shape :)



Here's the Paper :)

See also...



Demo Video (4' 13")



Video Preview (30")



My Homepage Kyunghwan.xyz

## Motivation

Two-dimensional (2D) GUI is everywhere!



However, **Smart glasses GUIs** are often one-dimensional (1D), organized linearly along the **horizontal axis.**



## Why?

- ✓ **Display's narrow field of view (FoV)**  
→ Rapidly being resolved nowadays
- ✓ **Thin touchpad as the input device**  
→ Challenging to distinguish 2D gestures  
→ Different control-display gains for two axes

