

UCL MotionInput 3 - In Air Keyboard with Ask-KITA Guide

The first time you run **M13-In-Air-Keyboard-with-Ask-KITA.exe** you might receive a Windows Smart Screen message. You can click on More Info -> Run anyway to run the program and it won't show up again in the future.

All the json files for MotionInput 3 are stored in the **data** folder.

When you first start this software it will start up in the default mode, mouse control.

To switch to the keyboard, simply do the "peace" gesture with your **dominant** hand (set to **right** as default).

To switch from the keyboard mode back to mouse control, make an L shape using your index finger and thumb, with your **dominant** hand.

Speech with Ask-KITA

You may immediately use Ask-KITA speech commands spoken out to the microphone on your computer:

1. Say "click", "double click" and "right click" for those mouse buttons.
2. In any editable text field, including in Word, Outlook, Teams etc; say "transcribe". Speak with short English sentences and pause, and it should appear. To end transcribe mode, say "transcribe" again to turn it off.
3. In any browser or office app, "page up" and "page down".
4. In PowerPoint you can say "next", "previous", "show fullscreen" and "escape".
5. "windows run" will bring up the windowskey+R dialog box.

Custom Key Bindings

Listed below are the default custom key bindings, their actions can be changed inside the in_air_keyboard.json file:

ESC – escape

CAP – caps lock

!#1 – switches to the keyboard layout with numbers and special characters

SC – switches to the keyboard layout with the shortcut buttons

<< - backspace

<- - enter

1/2 - switches to the second page of the special characters

2/2 - switches to the first page of the special characters

ABC – switches to the keyboard layout with letters

PS – print screen

INS – insert

HOM – home

DEL – delete

PU – page up

PD – page down

C1 – <http://outlook.com>

C2 – Ctrl+W – close window/tab

C3 - Ctrl+Z – undo

C4 – Ctrl+C – copy

C5 – Ctrl+V – paste

MIC – activate/deactivate Windows Voice Assistant

Kita – activate/deactivate Ask Kita

Note: action, width, height, bg_colour, font_size are optional parameters which can be added to a key object, in the JSON file, to override their default values. All key objects must have an x and y coordinate.

Actions

The available actions for a key are "link", "speech_to_text", "press_special", "press_special_combination", "switch_layout" and "toggle_caps_lock".

The following examples show how these actions can be defined in JSON:

1. Press Windows Key - "action": ["press_special", ["windows"]]
2. Activate/Deactivate Ask Kita Speech to Text - "action": ["speech_to_text", []]
3. Toggle Caps Lock - "action": ["toggle_caps_lock", []]
4. Press Key Combination for Task Manager -
"action": ["press_special_combination", [{"ctrl", "c"}]]
5. Switch the current layout to the layout named "2" in the JSON file -
"action": ["switch_layout", ["2"]]
6. Open Netflix - "action": ["link", ["https://www.netflix.com"]]

Keys & Layouts

To add a new key, simply add a new key object under keys in the in_air_keyboard.json file, e.g.

```
"s":{
```

```
"x": 55,  
"y": 100,  
}
```

As mentioned previously you can also define optional parameters in the key object to override their default values. For example, to change the background colour of the 's' key:

```
"s":{  
  "x": 55,  
  "y": 100,  
  "bg_colour": [255, 0, 0]  
}
```

Note: In this build, colours are read in the BGR format (instead of RGB) as this is the OpenCV default.

To display this key in the keyboard, the key must be present in a keyboard layout.

The first defined layout under "layouts" is the **default** keyboard layout. Simply add your new key to the list here if you would like it to appear as soon as you switch to the keyboard.

You can also add the key to a completely new layout. Remember to create/edit a key to switch to this layout if you'd like the layout to be accessible.

```
"5":["s"]
```

Adding a new key to switch to this layout:

```
"SC2":{  
  "x": 115,  
  "y": 310,  
  "action": ["switch_layout", ["5"]]  
}
```

Special Keys

You may have noticed the "press_special" action. This action is required for pressing any of the following keys which are available on a standard keyboard:

"Esc", "Ctrl", "Shift", "Alt", "Windows", "Enter", "Backspace", "F1", "F2", "F3", "F4", "F5", "F6", "F7", "F8", "F9", "F10", "F11", "F12", "Print Screen", "Insert", "Delete", "Home", "End", "Page Up", "Page Down"

Other customisations (advanced)

Warning! Always make a backup of any setting file changes such as the JSON files.

Inside config.json, under events -> keyboard, settings for the keyboard can be customised such as the number of touchpoints and the click gestures being used for each finger.

These are the settings currently set in config, for 6 touchpoints:

```
"keyboard": {  
  "landmarks": ["index", "middle", "ring"],  
  "gesture_type": "pulldown",  
  "single_tap_min_bound": 0.02,  
  "single_tap_max_bound": 1,  
  "hold_press_min_duration": 3,  
  "default_key_font_size": 0.75,  
  "default_key_width": 50,  
  "default_key_height": 50,  
  "default_key_bg_colour": [0, 0, 0],  
  "default_transparency": 0.7  
}
```

The main settings to note are landmarks, gesture_type and hold_press_min_duration. To change the number of touchpoints to 4, you could make the following changes to these flags:

```
"landmarks": ["index", "middle"]
```

To change to 2 touchpoints and use the pinch gesture instead (recommended for the most accurate typing experience):

```
"landmarks": ["index"],  
"gesture_type": "pinch"
```

Note: the pinch and scissor gestures are only supported with the index landmark

The hold_press_min_duration is a flag to set the minimum time required (in seconds) for a gesture to be held before holding a key is activated.