

## AI-powered hand posture recognition solution using VL53L7CX and VL53L8CX multizone Time-of-Flight ranging sensors



### Product status link

[STSW-IMG050](#)

### Features

- Hand posture recognition solution using an ST multizone ToF sensor on a NUCLEO-F401RE
- Development process based on the following steps:
  - Define your own set of hand postures (dataset)
  - Collect your dataset from multiple users using distance and signal data from the VL53L7CX or VL53L8CX 8x8 multizone ToF sensors
  - Train the AI network using the training script from the STM32 model zoo
  - Implement the AI model into your STM32 MCU using the "STM32Cube.AI developer cloud" or the "Hand posture getting started guide" from the STM32 model zoo
- Approach enables quick development with configurable hand postures, small memory footprint, and low processing power
- The ToF sensor can be positioned in front of the user (personal computer, satisfaction box), pointed at the ceiling (cooking plate), or fixed on a moving object (smart glasses, AR/VR headset, robotics), depending on the application
- The same unique solution supports the:
  - VL53L7CX ToF 8x8 multizone ranging sensor with 90° field of view (FoV)
  - VL53L8CX low-power, high-performance 8x8 multizone ToF sensor with 65° FoV
- Hand posture recognition using FlightSense technology:
  - Supports full privacy as no images are captured
  - Works independently of target reflectance and performs well even with gloves
  - Allows easy integration of the "all-in-one sensor" which can be hidden behind a dark cover glass
  - Ensures low power consumption and easy integration into any architecture

### Description

Have you ever dreamed of controlling a machine or sending emojis to your friends using hand gestures? This is now a reality! Thanks to ST's multizone ToF sensors, this solution does not require a camera module. AI algorithms run on the STM32 microcontroller (NUCLEO-F401RE) with low processing complexity and low-power consumption. To access the AI learning resources for hand posture recognition, go to [st.com/hand-posture](https://st.com/hand-posture).

We also offer gesture recognition software with a complete development ecosystem (STSW-IMG035), including ready-to-use example code and an intuitive GUI for reduced design times.

In addition, we have developed a comprehensive library that integrates gesture recognition, hand posture recognition, and smart presence detection into a single software solution. This combined software is available in the "Get Software" section of the STSW-IMG050.

Download the [STSW-IMG048 data brief](#) to learn more about smart presence detection.

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
03-Apr-2025	1	Initial release
08-Apr-2025	2	Added cover image.
23-Apr-2025	3	Updated links and made some small text changes to improve readability.
25-Apr-2025	4	<a href="#">Features</a> : Removed information about smart presence. <a href="#">Description</a> : Updated wording for the hand-posture link.

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