

AAGI Manual

- Introduction -

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Structure of the AAGI Manual

Structure of the AAGI Manual (1)

1. AAGI Manual - Introduction - (this manual)

This section provides a brief overview of AAGI. Please read it **FIRST** before launching the application. Note that this section contains only an explanation and does not include configuration or operational details.

2. Camera Installation and AAGI Activation

Begin by installing the camera, then activate AAGI. Before using AAGI, this section will explain the basics of the application.

3. How to Use Each Module

AAGI consists of several modules, each corresponding to a specific gesture for different body parts. This section explains how to use each module. Refer only to the modules you need. You can find a list of modules in sections '1.5 Recognizable Gestures' and '1.6 Recognition Modules' of this manual.

4. How to Use Gesture Music

This section explains how to use Gesture Music (software) to teach the PC the user's gestures. Only specific modules (Fine movement, head, wink, mouth/tongue, shoulder, finger, and knee) are required. Please refer to this section based on the module you are using.

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Structure of the AAGI Manual (2)

5. External Output Settings

External Output settings determine which gestures (switches) are assigned to which keys or controls in each application unit. You can assign not only single keys but also simultaneous key presses and sequential key operations. Once set up, the settings will automatically adjust each time the application is switched.

6. Head Estimation Settings

This section explains how to configure 'Head Estimation' to determine the position of the user's head. Only specific modules (head, wink, mouth/tongue, and shoulders) are required. Refer to this section when performing head estimation.

7. Troubleshooting and Reference

This section provides comprehensive troubleshooting and reference information for AAGI. For troubleshooting and additional details related to each module, please refer to the end of the respective module's manual.

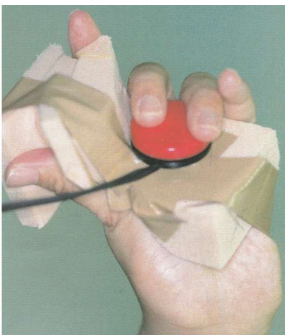
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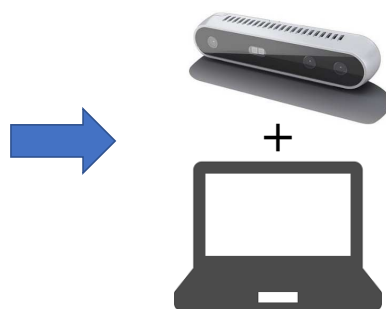
1. What is AAGI

1.1. What is Gesture Interface

Switch used by people with motor dysfunction



3D camera + PC for New Recognition-Type Application



Assumed use



This system provides a non-contact, non-constraining, gesture-based switch tailored to user needs by connecting a depth image camera to a PC (Windows), as an alternative to conventional switch devices. It is specifically designed for individuals with motor dysfunctions who find it challenging to use standard interfaces.

To achieve this, we collected a diverse range of movements from individuals with motor dysfunction and developed a fundamental recognition module. We created a typology based on the target areas where voluntary movements are possible. By first selecting an appropriate recognition module and then customizing (learning) that module to fit individual users, we have developed an interface suitable for those who cannot use traditional interfaces.

Multiple gestures can be used simultaneously if there are several voluntary movement-capable areas within the camera's field of view. Our goal is to advance gesture-based interfaces that can be adapted for general users and help bridge the digital divide.

1.2. About AAGI

AAGI is software designed to operate PC keyboards, mice, home appliances, and game consoles through the user's gestures. By utilizing a depth camera, AAGI provides a non-contact, non-restrictive, gesture-based interface tailored to users' needs, specifically for individuals with disabilities who find conventional interfaces challenging.

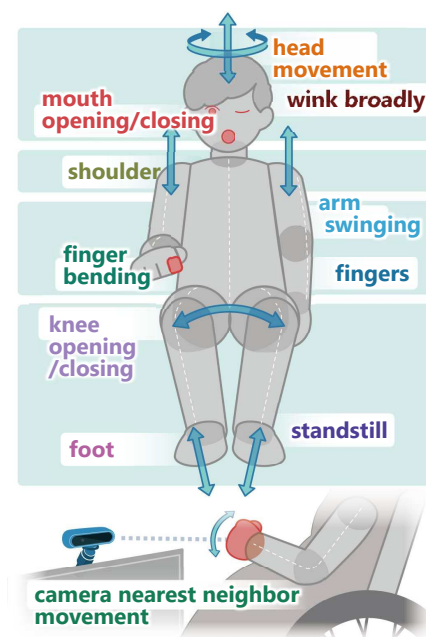
AAGI stands for Augmentative and Alternative Gesture Interface, which extends the user's capabilities through a gesture-based interface.

The key feature of AAGI is that it learns the **user's reproducible gestures**, rather than relying on predefined gestures.

To achieve this, AAGI collects a diverse range of gestures from individuals with motor dysfunction and creates nine distinct recognition modules. The user selects the module that best fits their needs and performs the gesture, allowing the PC to learn and recognize the movement.

Multiple gestures can be used simultaneously.

Additionally, the system is compatible with various existing devices and can be used in conjunction with them.



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1.3. What AAGI Can Do

- **Direct PC Operation**
 - Maps a single gesture to a specific key, mouse click, or other input.
 - Configurable settings that automatically switch based on the application in use.
 - Compatible with existing devices.
- **Operation via PC Scanning Keyboard/Mouse**
 - Supports the Windows On-Screen Keyboard
- **Home Appliance Operation**
 - Operates via Gesture Link (originally developed software).
 - Controls infrared remote devices via Nature Remo (commercially available learning remote control).
 - Supports registration of virtually any device with an infrared remote control.
- **Game operation**
 - Compatible with PC games (Steam, online games), dedicated consoles (Nintendo Switch, Sony PlayStation, MS Xbox), etc.
 - PC games can be played as usual; for dedicated consoles, use the Titan One interface and Nintendo Switch Pro Controller.
 - Flex Controller (by Technotools Co., Ltd.) is also compatible with existing devices.

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1.4. AAGI Operating Environment



- **Camera Requirements**

- RGB-D camera (capable of capturing both color and depth images) or RGB camera (capable of capturing only color images).
- Compatible with typical PC environments where RealSense operates without issues.
- Supported Cameras: Intel RealSense Depth Camera D415, D435, D405 and UVC camera.

- **Operating System**

- Windows 10 or 11 (Home/Pro, 64-bit).

- **Processor**

- Intel Core i5, i7 or better (8 logical cores or more recommended).

- **Memory**

- 8GB RAM or more.

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1.5. Recognizable Gestures

AAGI consists of several **modules**, each capable of recognizing various types of gestures. Please select the module that best meets the user's needs.

For detailed instructions on how to use each module, refer to the manual section '3. How to Use Each Module'.

The table on the right displays the gestures associated with each module.

- **Multiple modules can be used simultaneously.**










- If the user can move their head, we recommend using the Wink or Tongue module. If head movement is not possible, similar gestures can be recognized using the Slight module, which is recommended in such cases.

Each Module and Corresponding Gesture

Modules	Gestures
Slight	Fine movement of the specified area
Front	Movement of the part of the body closest to the camera
Head	Left/right and up/down of head
Wink	Movements around the eyes (big wink, eyebrows up and down, wrinkles between eyebrows, etc.)
Tongue	Tongue in and out, opening and closing the mouth, raising the corners of the mouth/pouting
Shoulder	Shoulders (left and right separately) up/down and front/back
Finger	Finger bending with finger sacks
Knee	Knee opening and closing
Foot	Standstill

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1.6. 9 Recognition Modules

Slight  fine movement	Head  movement of head	Wink  movement of eye	Tongue  mouth & tongue	Shoulder  shoulders up/down
Front  closest to camera	Finger  finger bending	Knee  knee opening/closing	Foot  standstill	