

Using Zenbo Lab

What is Zenbo Lab

Zenbo Lab is a block-based programming website that teaches Robotics and Artificial Intelligence and supports Python coding. Other than for STEAM education, Zenbo Lab's powerful capabilities allow Zenbo Junior to assist in other courses such as practicing English conversations, fun quizzes, and more.

The files created in Zenbo Lab can be exported to run on Zenbo Junior without needing a computer or laptop.

This document is applicable to Zenbo Lab version: 1.0.4.20201127

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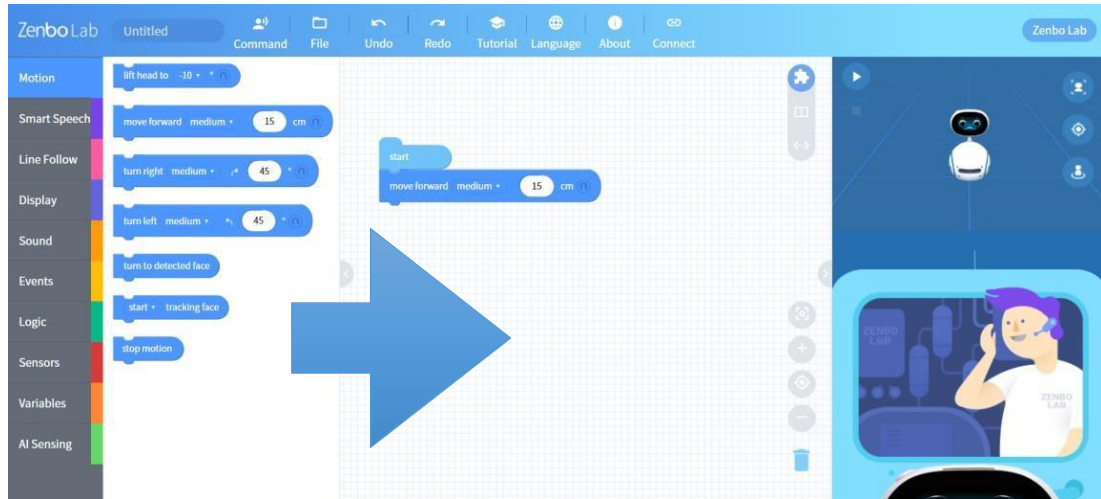
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1. Start Guide

Follow these five simple steps to start controlling Zenbo Junior! Make Zenbo Junior move forward!

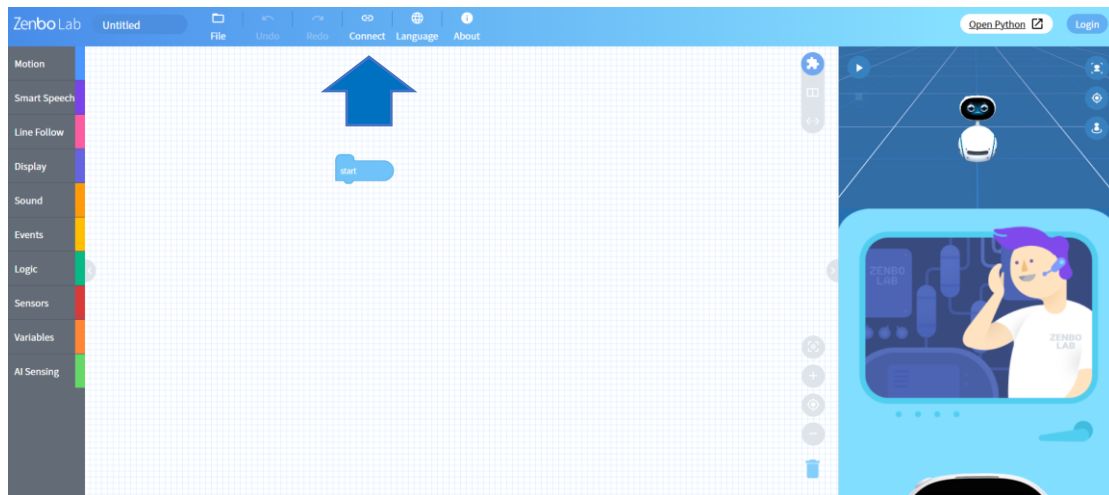
Step 1: Drag the blocks from the list on the left to the editing area and combine the desired actions and dialogue content ◦



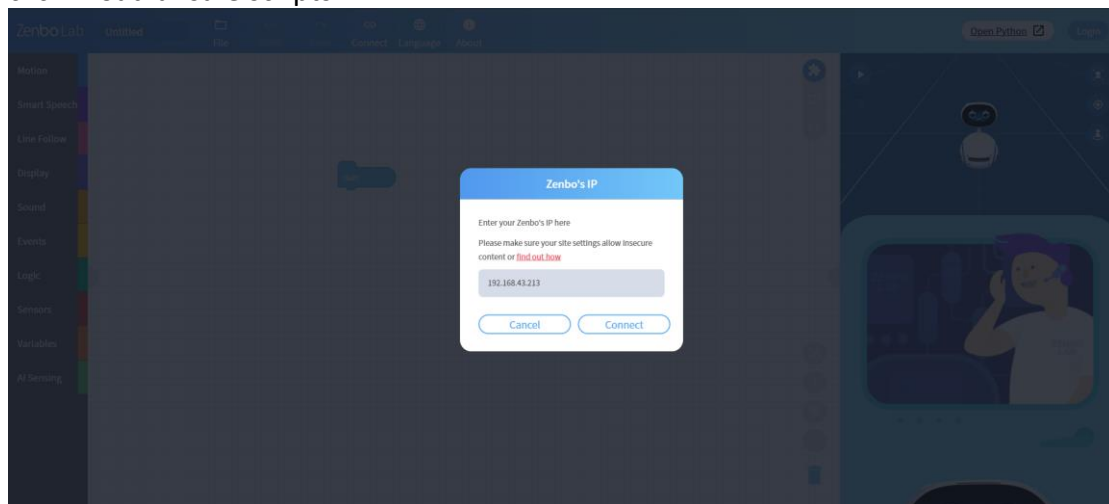
Step 2: Open the Zenbo Lab APP on Zenbo Junior. Here, you can see the IP address.



Step 3: Click connect and enter the IP address, then click connect again.



Step 4: Click the shield icon on the right side of the URL bar in Google Chrome. Then click “Load unsafe scripts.”



Step 5: Click connect and enter the IP address, then click connect again.

After completing the five steps, click “Connect” to watch Zenbo Junior execute your code.

2. System Requirements for Zenbo Lab

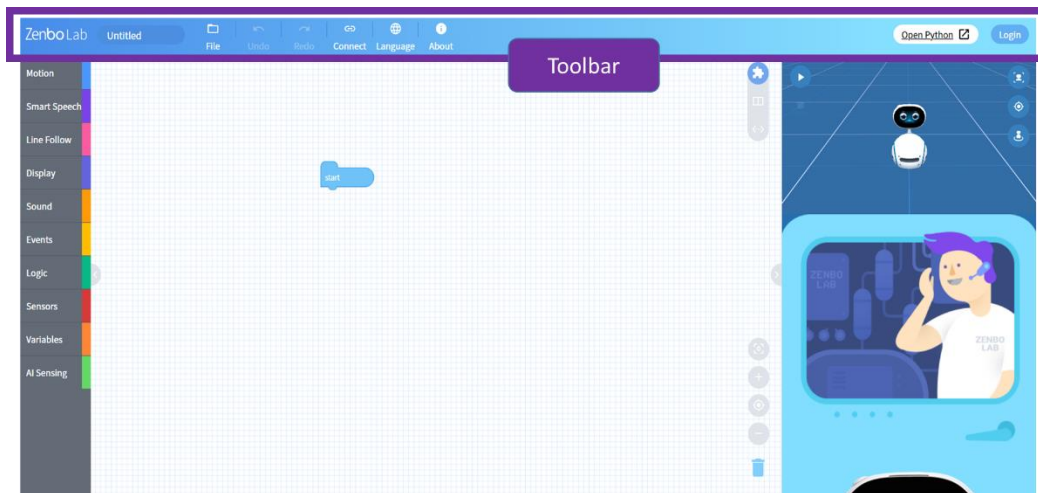
Zenbo Lab is web-based. There is no need to install Zenbo Lab on your device. We recommend using the Google Chrome browser.

3. Understanding the User Interface

3.1. Toolbar

3.1.1. Project Name

The default project name is “Untitled.” You can modify the project name anytime.



3.1.2. File Tab

In the file tab, you can create a new project, open an existing project, and save the current project.

3.1.3. Undo and Redo

Undo returns to the previous step of the edit, while redo redoes the edit.

3.1.4. Language

Change the display language. Zenbo Lab supports Traditional Chinese, Simplified Chinese, English and Japanese.

3.1.5. Connect

To execute a project on Zenbo Junior, make sure to connect both Zenbo Junior and your PC to the same Wi-Fi network. Enter the IP address located in the Zenbo Lab APP on Zenbo Junior to connect your PC to Zenbo Junior.

3.1.6. About

About is including two functions:

- a. Tutorial : clicking tutorial will direct you to Zenbo Lab Official Website, where you can find more information and sample files.
- b. About : You can find out about the software version and license agreement here.

3.1.7. Open Python Mode

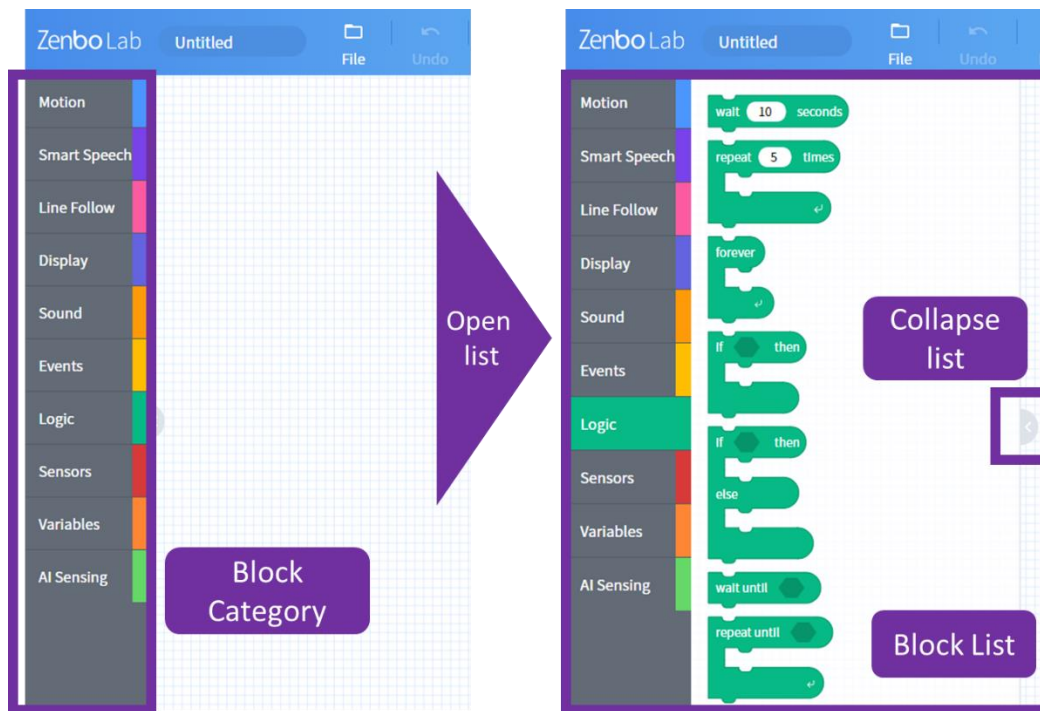
Clicking Open Python will open a new window, you can use Python Code to edit the project, please refer to the Python related chapters for the description of Python mode.

3.1.8. Login

Click on the icon on the very right side of the toolbar to login to your account. You can access more features and functions such as voiceprint recognition and facial recognition by logging into your account. Other than creating a Zenbo Lab account, you can log in with your Facebook or Google account as well.

3.2.Blocks Menu

Here, you can find all the blocks supported in Zenbo Lab. Subsequent chapters contain detailed information on individual blocks.



3.2.1. Block Category

Clicking the block category will open the list of blocks in each category. You can close the block list by clicking the rightmost arrow.

3.2.2. Block List

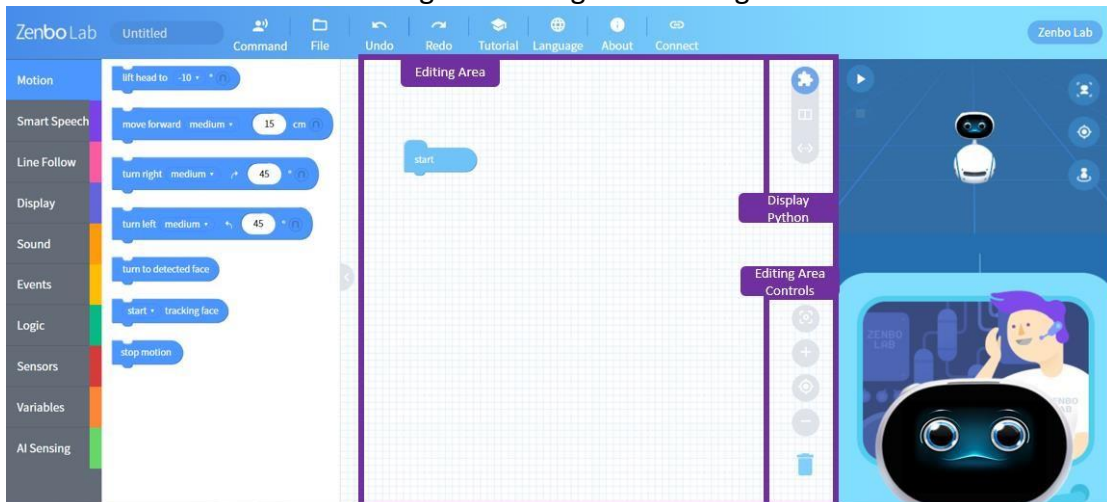
You can use the scroll button to scroll down to view the list of blocks for each category.

3.2.3. Collapse List

The menu can be collapsed in sections to collapse the block menu, and then collapse the block category menu. Maximize the space in the workspace.

3.3.Editing Area

This is the editing area. You can hide the block category and block list on the left and the simulator area on the right to enlarge the editing area.



3.3.1. Combining Blocks

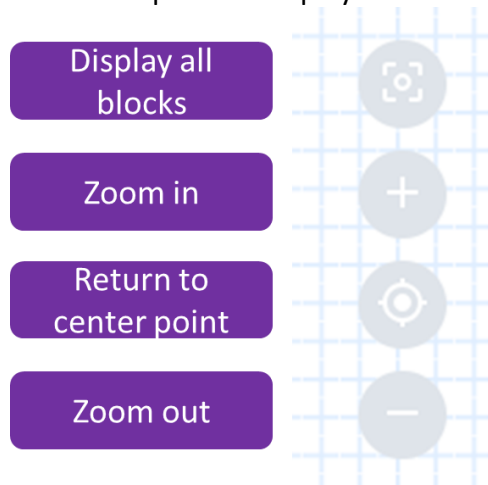
You can drag the blocks and combine them in the editing area to design desired behaviors and actions.

3.3.2. Deleting Blocks

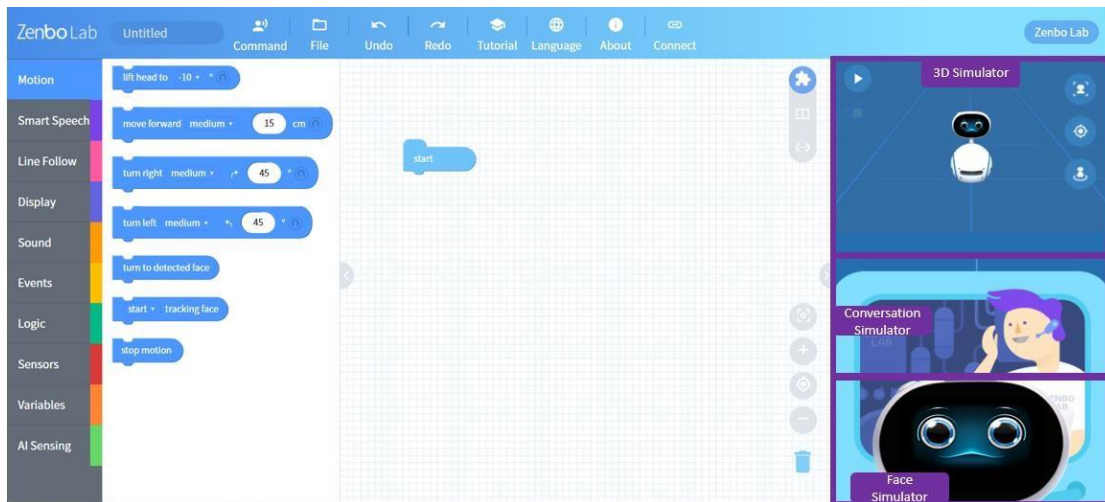
To delete a block, you can drag and drop the block in the trash can or right click to delete it.

3.3.3. Editing Area Controls

In addition to using the mouse wheel to zoom in and out, you can use the control buttons. If there are too many blocks, you can use the center button to return to the center point or display all blocks button to display all blocks.

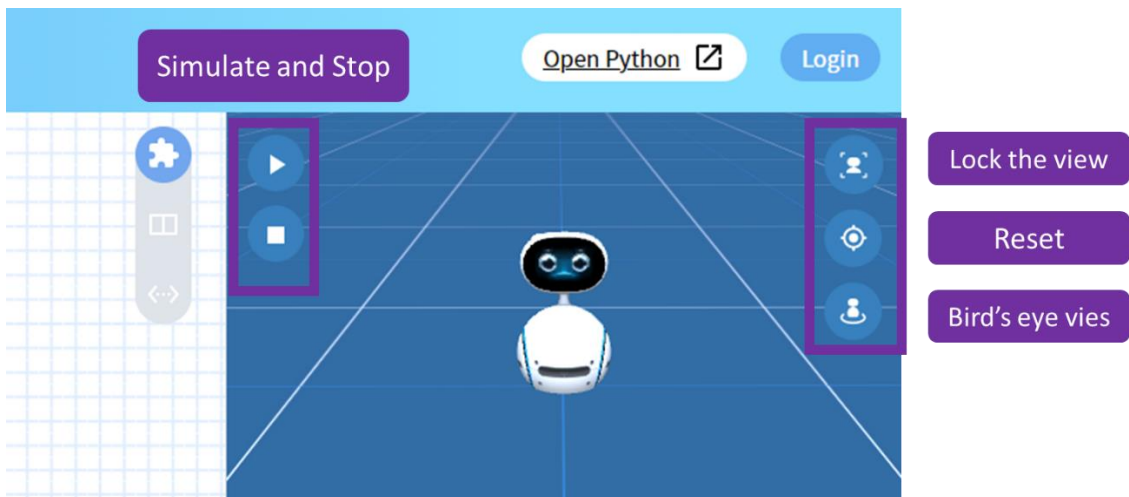


3.4. Zenbo Simulator



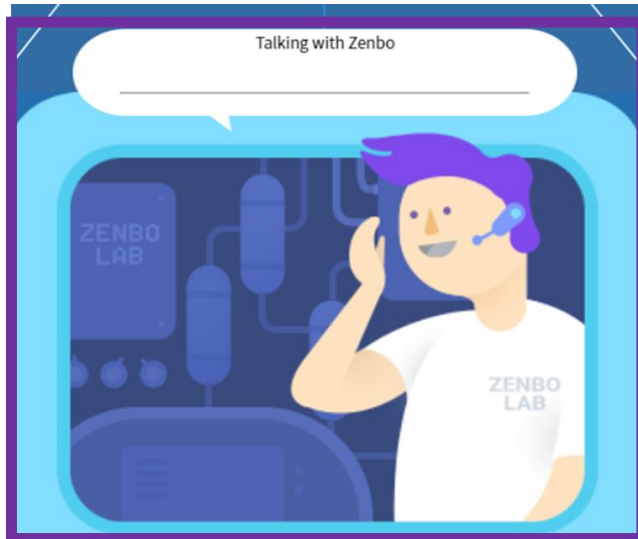
3.4.1. 3D Simulator

Before connecting to Zenbo Junior, you can simulate the movements and actions of Zenbo Junior with the 3D simulator. Click the play button to start the simulation and the stop button to stop. There are three additional buttons: reposition the Zenbo Junior in the simulator; reset, and bird's eye view.



3.4.2. Dialogue and input simulated value

When executing the block "Start listening", the robot will listen to the dialogue. Users can use the keyboard to input text in the dialog box to simulate the sentence that robot heard. In addition, many blocks are the value for the robot to detect the environment, such as "the angle of sound". When this kind of block is simulated, the dialog box will appear in this position for asking the value to be simulated.

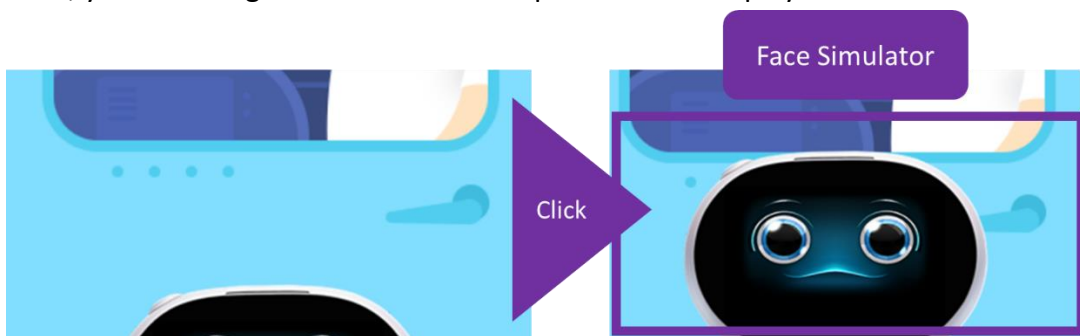


Dialogue and input simulated value

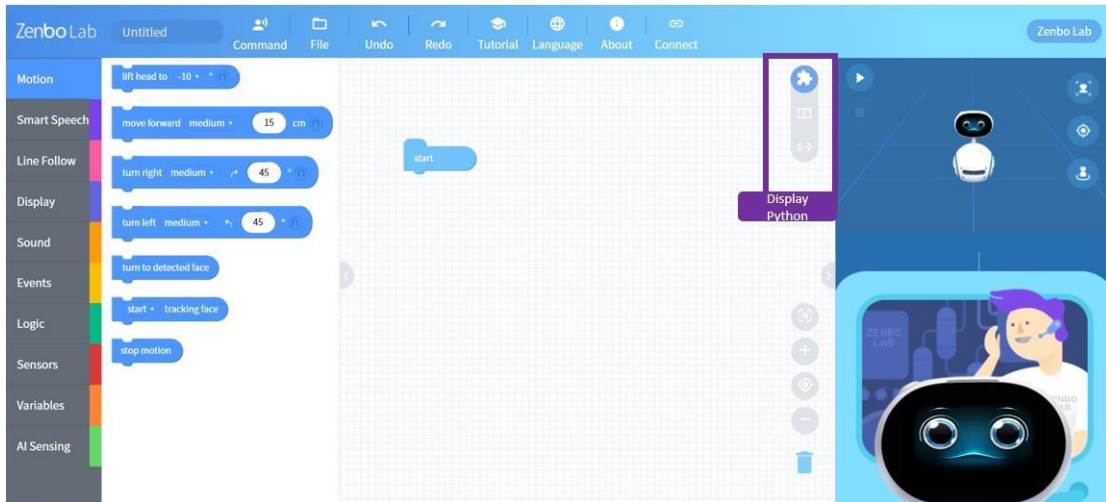
3.4.3. Face Simulator

Click on the top of Zenbo Junior's head to display or conceal the face simulator.

Here, you can design Zenbo Junior's expression and display interface.



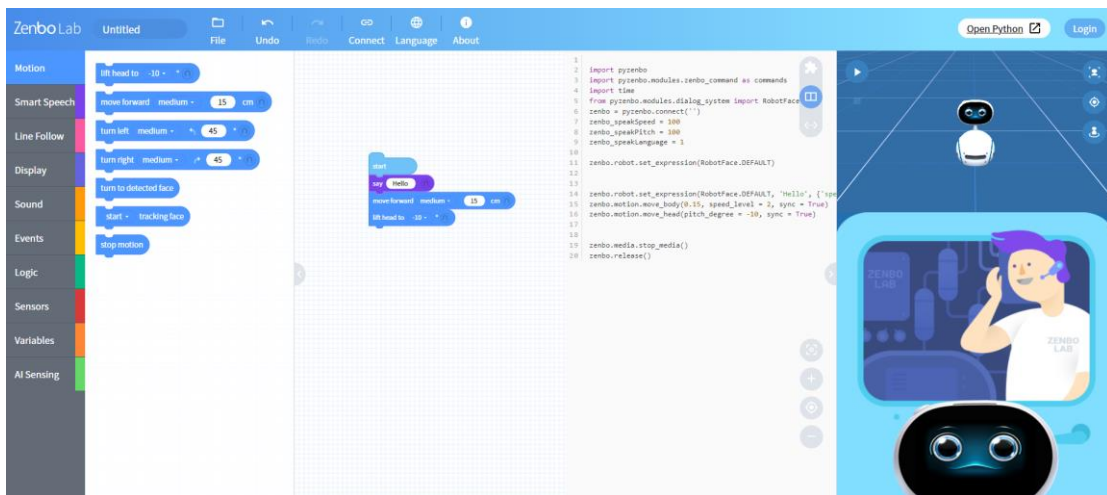
4. Python



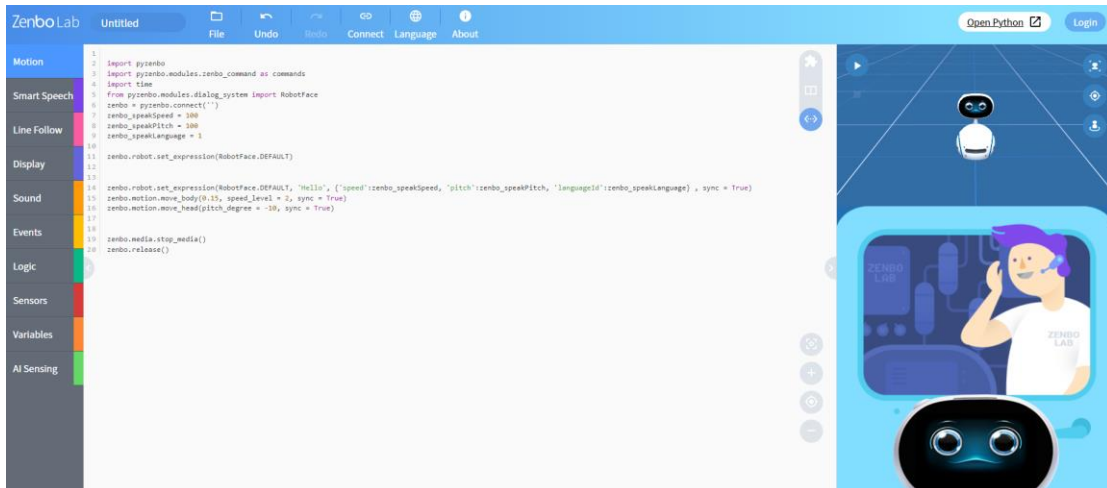
4.1. Display Python Code

Click on the “display Python” button to view your code in Python. Each block has a corresponding Python code. There are three different viewing modes: Blockonly mode; block-Python comparison mode; and Python-only mode. Block-Python comparison mode can compare blocks and Python code. In this mode, Python code cannot be edited, only reference can be made.

Block-Python comparison mode :



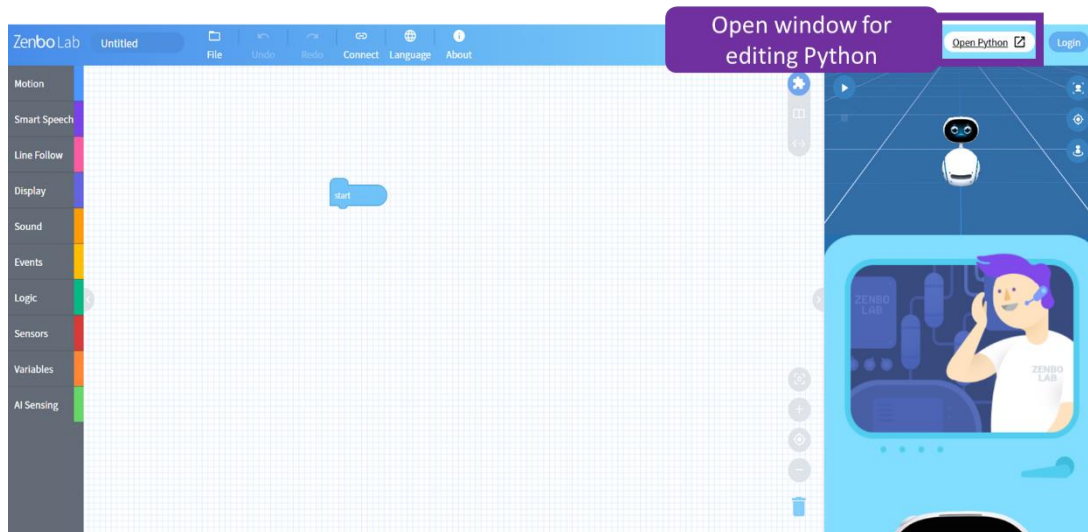
Python-only mode :



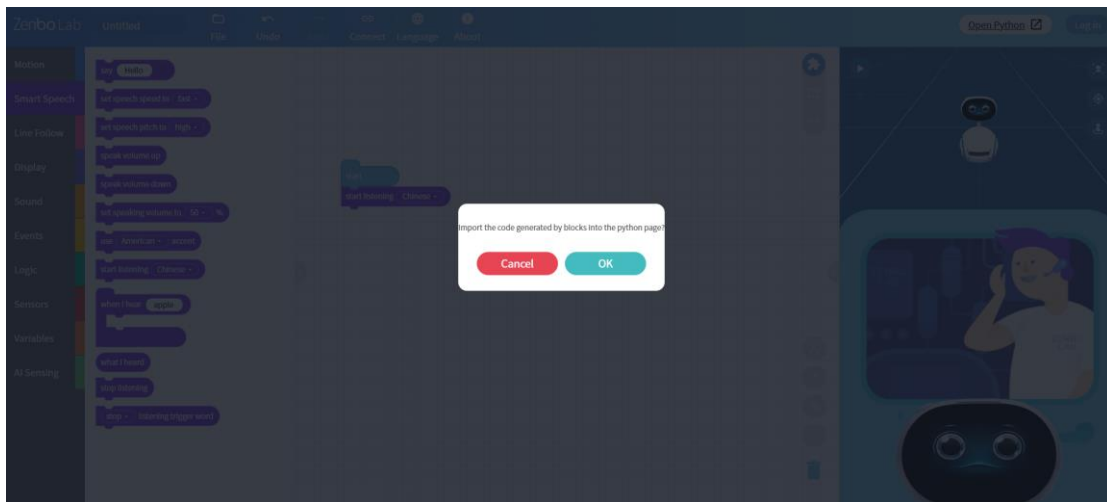
4.2. Code with Python to Control Zenbo Junior

To write Python code to control Zenbo Junior, you need to click "Open Python". Click Open Python to open a new window, you can use Python Code to edit the project. When connecting to Zenbo Junior, make sure the Zenbo Lab APP is open on Zenbo Junior and both your PC and Zenbo Junior are connected to the same Wi-fi network.

Open editing window



If you choose OK, the Python code of the blocks in the current workspace will be imported into the new window.



New window interface for Python editing mode

A screenshot of the ZenboLab Python editing interface. The window title is 'ZenboLab | Python' and the file name is 'Untitled'. The menu bar includes 'File', 'Connect', 'Run', 'Language', and 'About'. The code editor contains the following Python code:

```
1 import pyzenbo
2 import pyzenbo.modules.zenbo_command as commands
3 import pyzenbo.modules.zenbo_command as commands
4 import time
5 from pyzenbo.modules.dialog_system import RobotFace
6 zenbo = pyzenbo.connect('')
7 zenbo.robot.set_expression(RobotFace.DEFAULT)
8
9 zenbo.robot.speak_and_listen('', {'listenLanguageId':1})
10 time.sleep(int(1))
11
12 zenbo.media.stop_media()
13 zenbo.release()
```

At present, some functions are not yet open to Python editing mode.

- AI sensing

5. Block Shapes

5.1. Control Blocks

These are basic blocks that can fit above or below other blocks. They can be either rectangular or "C" shaped.



5.2. Start Event Block

Start Event blocks can only be placed on top of other blocks. Each Start Event block is activated by a specific method written in the block. Different scripts can be executed at different times.



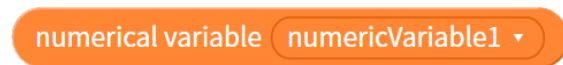
5.3. Logic and Boolean Blocks

The conditions described in each block will obtain a result that needs to be validated. The result will either be true or false. This block must be placed in other blocks with a matching shape.



5.4. Variable Blocks

Each variable block has a value, which may be numeric or a string. The input values of numeric variables can only be numbers. String variables can include text or symbols. This block must be placed in other blocks with a matching shape.



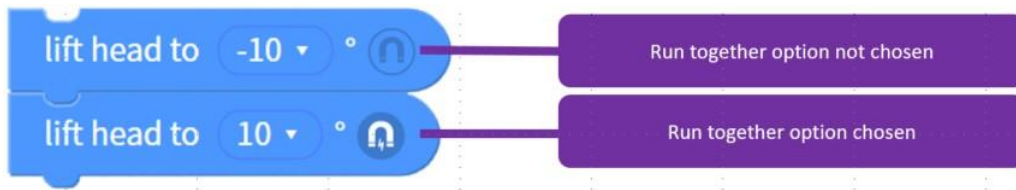
5.5. Start Block

Each script in a project starts with the start block. The blocks following the start block will execute after the start block runs.

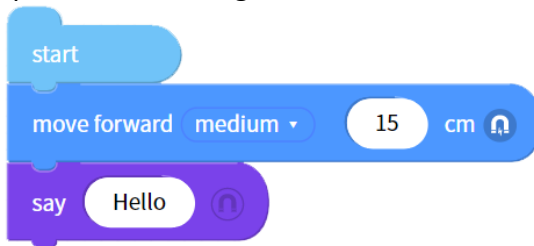


5.6. Rules for Running Blocks Together

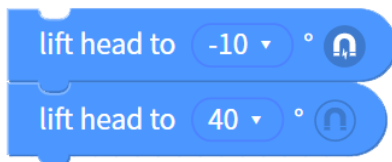
All blocks execute in sequence. The lower block will not run until the upper block has been executed. However, some blocks have a "Run Together" icon to the right. By clicking it, the following block will run at the same time.



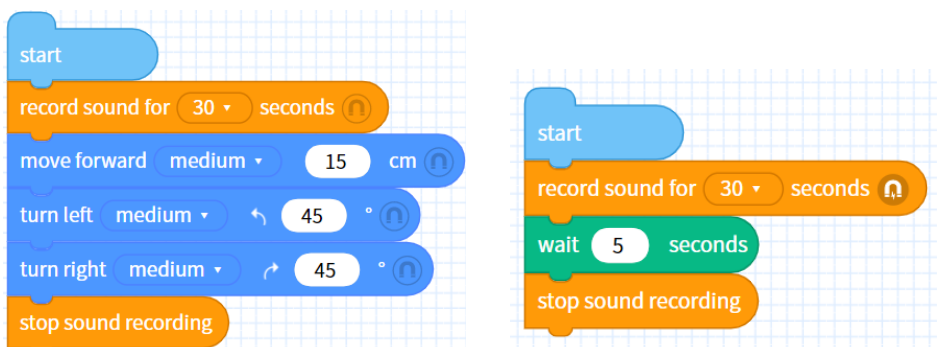
For example, if you want Zenbo Junior to move forward AND speak at the same time, you can click the “Run Together” icon. Otherwise, Zenbo Junior will only speak after moving forward.



If the upper and lower block uses the same resources, such as adjusting the head angle. Even with the option of “Run Together,” the lower block will not be executed until the upper block has finished.



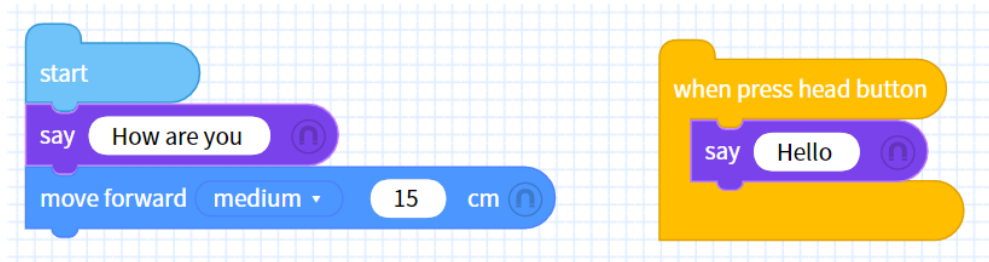
Some blocks have a time to proceed, such as recording, video recording, etc., you need to specify how long it will be performed first. If you want to stop the function of these blocks early and perform other blocks, you need to coordinate with other blocks to execute synchronously.



In these two examples, after the recording is started, the following actions will be started at the same time or wait for 5 seconds because the option “Run together” is on, and the recording will stop when the action is completed or the time reaches 5 seconds.

5.7.Rule for Start and Event

When an event block occurs, no matter what is being executed under the starting block, the ongoing function will be interrupted to proceed with the content under the event block.



When the button on the top of the robot's head is pressed, if the robot is saying "How are you", it will interrupt the conversation and say "Hello".

When the event is executed, it will return to the beginning of this sequence of programs, and the program that has not been executed will be executed.

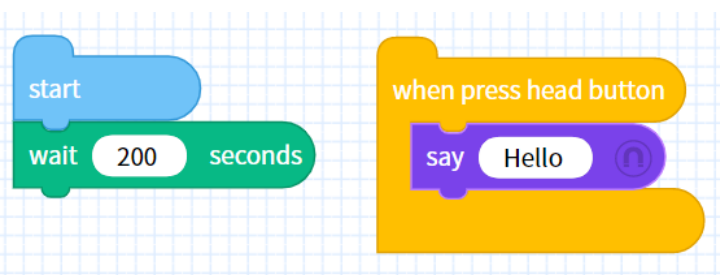
So after saying "Hello" , the robot will move the body forward 15 cm at a moderate speed.

Zenbo Lab's project execution time calculation is based on the time required to execute the blocks which under the block "start". If the event blocks are executed, but the blocks below the main program have not ended, you need to wait for the execution to complete so that the project is considered to be over.



After the start block, it's a delay block for waiting 200 seconds. If the head button is pressed, the event will be triggered, make Zenbo Junior say "Hello" and interrupt the delay block. After saying Hello, return to the main program to wait for 200 seconds and the blocks below. But there are no blocks below, so the program is over.

If you want the program keep waiting for the event be triggered, drag a "repeat forever" under the start block.



6. Basic Block Functions

6.1. Motion

6.1.1. Lift Head

You can control Zenbo Junior to lift his head to a certain degree.

Ex: Lift head to (-10) degrees; Zenbo Junior will lower his head to -10 degrees.

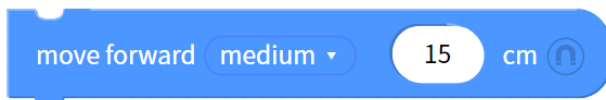
The head can be lifted to at most 50 degrees and lowered to at most -10 degrees.



6.1.2. Move Forward

You can control Zenbo Junior to move forward at a certain speed and distance.

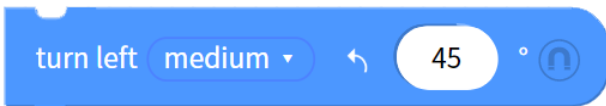
Ex: Move forward (medium) (15) cm; Zenbo Junior will move forward 15 cm. The upper and lower limits of the input value are plus and minus 30,000. If you enter a negative value, Zenbo Junior will turn 180 degrees and move forward.



6.1.3. Turn Left

You can control the angle and speed at which Zenbo Junior turns.

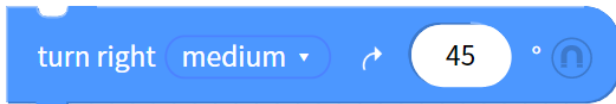
Ex: Turn left (medium) (45) degrees; Zenbo Junior will turn left 45 degrees. The upper and lower limits of the input value are plus and minus 3,000. If you enter a negative value, Zenbo Junior will turn right.



6.1.4. Turn right

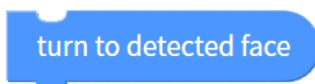
You can control the angle at which Zenbo Junior turns.

Ex: Turn right (medium) (45) degrees; Zenbo Junior will turn right 45 degrees. The upper and lower limits of the input value are plus and minus 3,000. If you enter a negative value, Zenbo Junior will turn left.



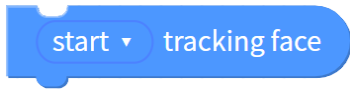
6.1.5. Turn to Detected Face

Zenbo Junior will turn towards a detected face; however, he will not move along with the detected face.



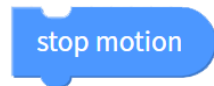
6.1.6. Tracking Face

Zenbo Junior will slowly rotate to detect a face nearby. Once detected, it will continue to follow the face; however, it will not move from the original position.



6.1.7. Stop Motion

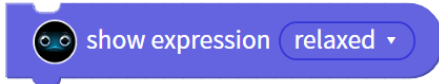
You can stop Zenbo Junior from moving or lifting it's head



6.2.Display

6.2.1. Show Expression

You can pick and set Zenbo Junior' s facial expression from 23 different ones. The expression continues to appear until you switch to another one.



6.2.2. Set Wheel LED Lights

You can set the LED lights on one or both of the wheels. There are 14 different display modes. Of the 14 different modes, you can set the color for static, breath, blink, comet, move-flash, and single color wave mode. The other 8 display modes have special effects that cannot be changed. Once the lighting effect is set, it will continue to occur until you change the display mode or stop the wheel LED lights.



6.2.3. Stop Wheel Lights

You can stop the wheel light effects on one or both wheels.



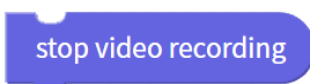
6.2.4. Record Video

You can set the duration of the video recording: 15, 30, 45, or 60 seconds long. This function only works after the project has been transferred to Zenbo Junior.



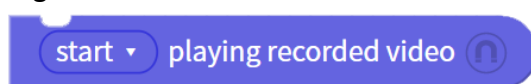
6.2.5. Stop Video Recording

This blocks forcibly stops video recording. You can stop recording video after a set number of seconds. However, it must be used with event blocks. Please refer to the description of using "Run Together" blocks.



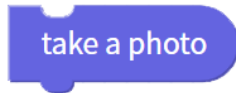
6.2.6. Play Recorded Video

Set start or stop playing the video just recorded. The stop playing video block must be used with event blocks. Please refer to the description of using "Run Together" blocks.



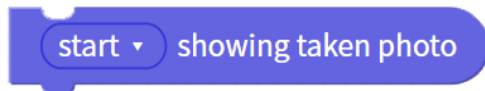
6.2.7. Take a Photo

When using this block, the camera will turn and take a picture after a three second countdown. This function only works after the project has been transferred to Zenbo Junior.



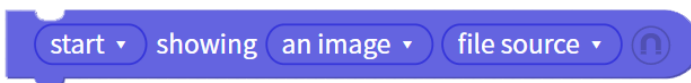
6.2.8. Show Taken Photo

Set start or stop showing the photo just taken.



6.2.9. Show an Image or Video

Click on the file source to specify the image or video file location you would like to display. The stop showing image or video block must be used with event blocks. Please refer to the description of using "Run Together" blocks.



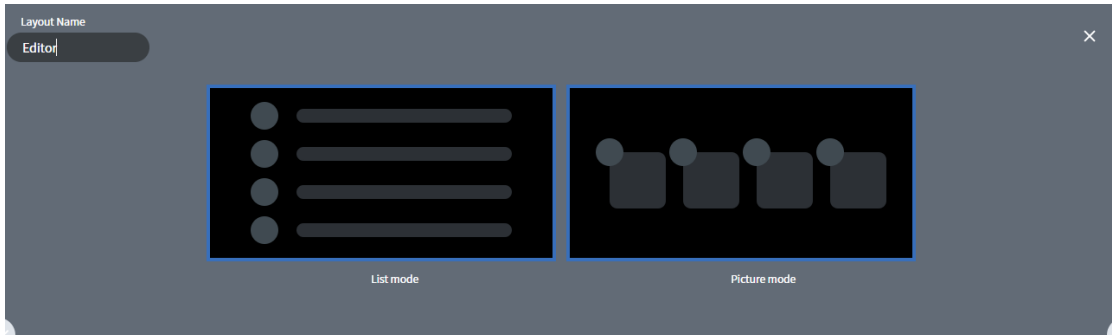
6.2.10. Show and Edit Interface

You can edit the list to be displayed on Zenbo Junior's face by yourself.

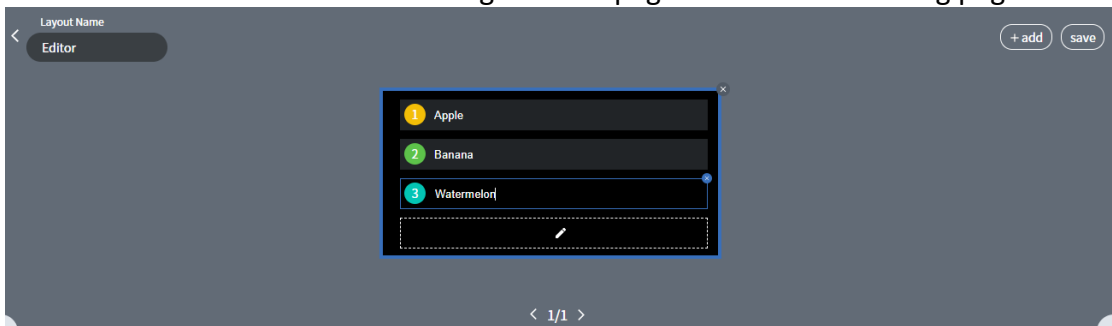


Click the drop-down menu of interface 1 to add an interface, and click "Edit" to edit the content of the interface. In the editing interface, you need to choose one of two interface formats, list-mode or picture-mode. Regardless of the format, a maximum of four items can be displayed on a page, but there can be created multiple pages. When displaying on Zenbo Junior's face, the user can click on any item, if it is multi-page, you must manually switch between the upper and lower pages. Once the user clicks on the item, a related message will be automatically sent out, and the blocks that receive the message need to be used to design following actions.

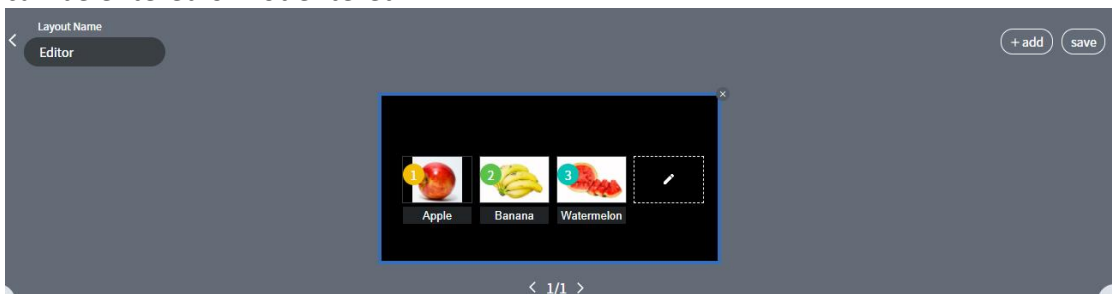
Choose the interface of list-mode or picture-mode, and the name of interface can be edited on the upper left.



You can edit the content after selecting the list mode, click “add” to add a page, and use the arrows on the left and right of the page to switch the editing page.

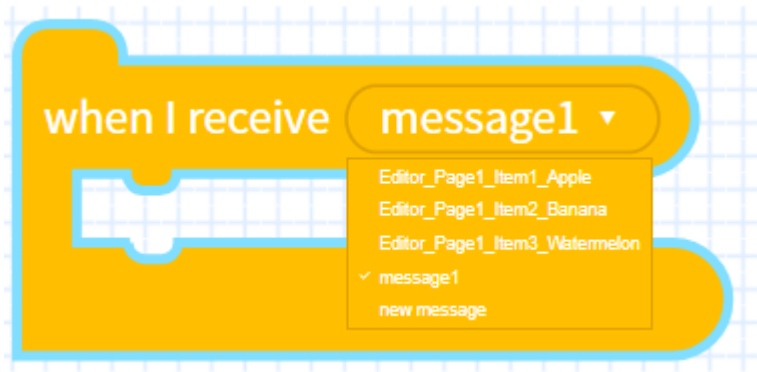


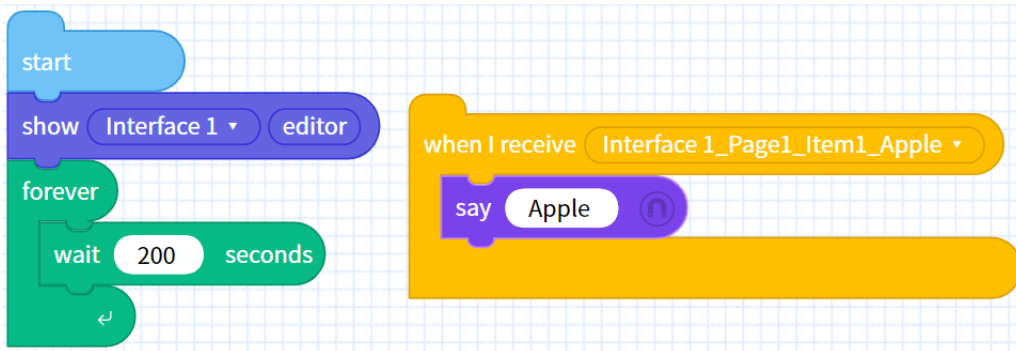
If you choose the picture mode, you can upload the image, and the text below can be entered or not entered.



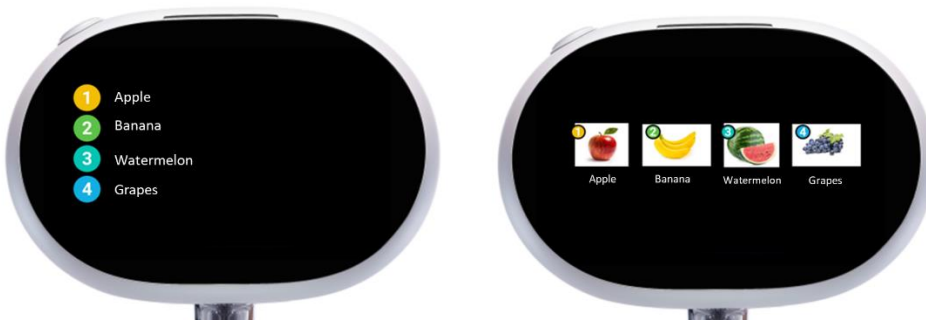
To cancel editing, press the arrow in the upper left corner to return to the menu, and then press the X in the upper right corner to exit.

The items in the interface will automatically generate messages, which can be found in the blocks “when the message is received” .



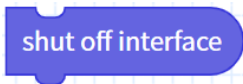


After Zenbo Junior show the interface and when the option A is clicked, Zenbo Junior say “Apple”.
Display the results of the interface.



6.2.11. Shut off interface

Forcibly stop displaying the interface.



6.3. Sound

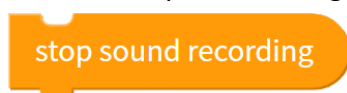
6.3.1. Record Sound

You can set the duration of the sound recording, from 30 to 180 seconds.



6.3.2. Stop Sound Recording

This blocks forcibly stops sound recording. You can stop recording sound after a set number of seconds. However, it must be used with event blocks. Please refer to the description of using “Run Together” blocks.



6.3.3. Play Recorded Sound

Set start playback or stop playing the sound just recorded. If the timing is not set, this event will play until the end of the audio file. It must be used with event blocks. Please refer to the description of using "Run Together" blocks.



6.3.4. Adjust Media Volume

Adjust the media volume one level higher or one level lower than the original.



6.3.5. Set Media Volume

Set the media volume from 0-100%.



6.3.6. Play Music

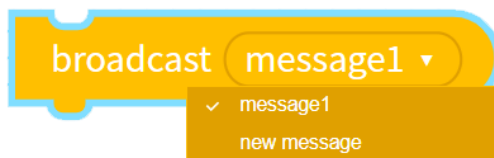
Click on the file source to specify the music file you would like to play. The stop playing music block must be used with event blocks. Please refer to the description of using "Run Together" blocks.



6.4.Events

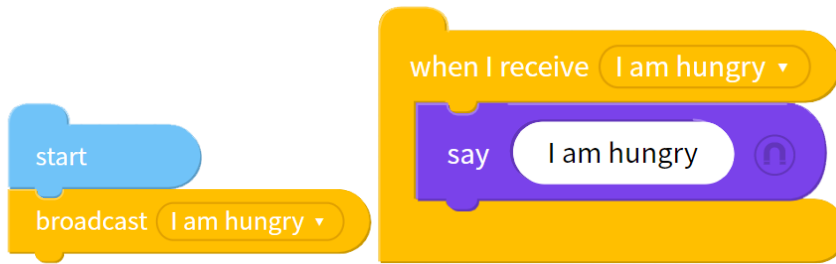
6.4.1. Broadcast Message

Broadcast the specified message. You can add new messages from the drop down menu.



6.4.2. When I Receive Message

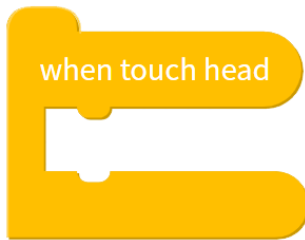
When the message is broadcasted, the blocks in the receiving end will run.



If I receive an "I am hungry" message, Zenbo Junior will say "I am hungry."

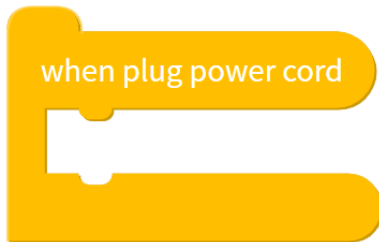
6.4.3. When Touch Head

Run the following blocks whenever Zenbo Junior's head is touched.



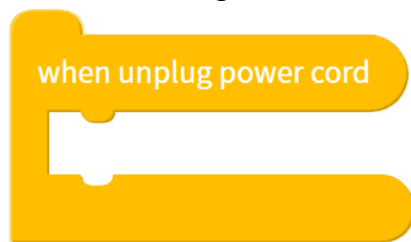
6.4.4. When Plug Power Cord

Run the following blocks whenever the power cord is plugged in.



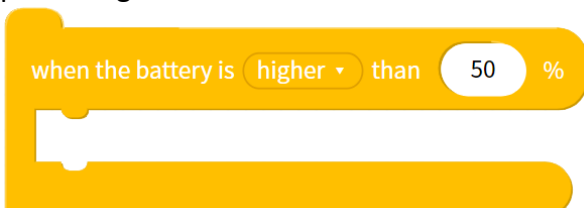
6.4.5. When Unplug Power Cord

Run the following blocks whenever the power cord is unplugged.



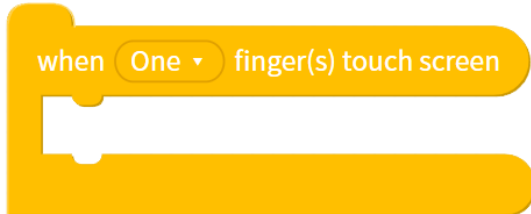
6.4.6. Battery Percentage

Run the following blocks whenever the battery is higher or lower than a certain percentage.



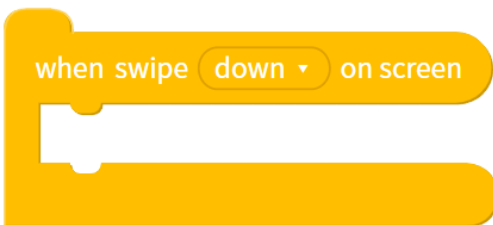
6.4.7. When (Number) Finger(s) Touch Screen

Run the following blocks whenever the screen is touched. The number of touches can be specified, from 1 to 10 points at the same time. Initiating the event will require the finger to stay on the screen for a short period of time.



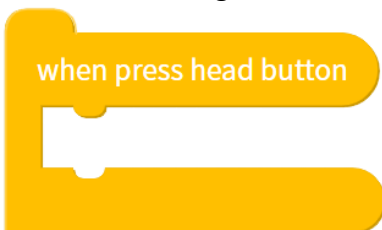
6.4.8. When Swipe (Direction) on Screen

Run the following blocks whenever the screen is swiped in a certain direction. You can set the swipe direction: upwards; downwards; to the right; and to the left.



6.4.9. When Press Head Button

Run the following blocks whenever the head button is pressed.



6.4.10. Stop all

The project close whenever run the block.



6.5. Logic

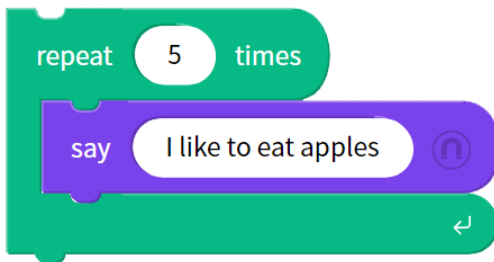
6.5.1. Wait (Number) Seconds

Run the following block after waiting a certain number of seconds.



6.5.2. Repeat (Number) Times

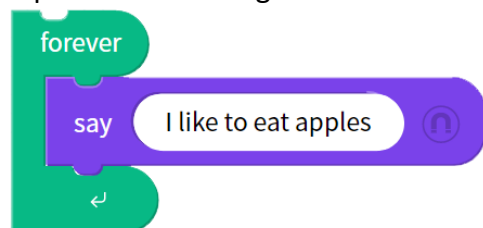
Repeat the script a certain number of times.



Say "I like to eat apples" repeatedly five times. °

6.5.3. Forever

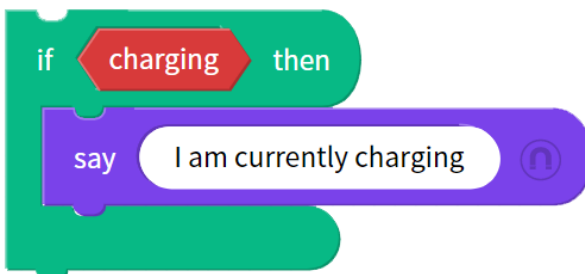
Repeat the following blocks in the script in a forever loop.



Say "I like to eat apples" repeatedly.

6.5.4. If, Then

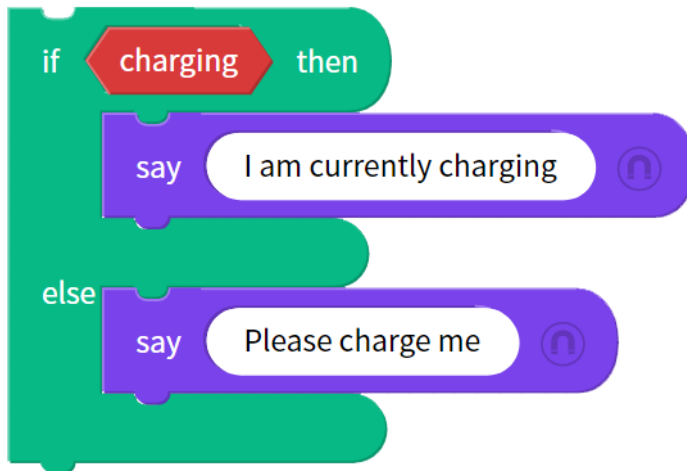
Execute the following blocks if they meet the specified conditions.



If Zenbo Junior is charging, say "I am currently charging."

6.5.5. If, Then, Else

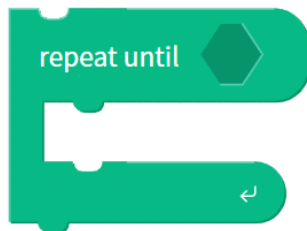
Execute the following blocks if they meet the specified conditions; otherwise, run the blocks under "else."



If Zenbo Junior is currently charging, say "I am currently charging." Else, say "Please charge me."

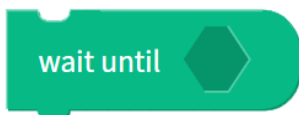
6.5.6. Repeat Until

Repeat the following blocks until they meet the specified conditions.



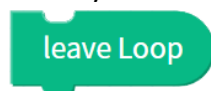
6.5.7. Wait Until

Wait until the conditions are met before running the following blocks.



6.5.8. Leave Loop

Forcibly leave a forever loop.



6.5.9. Adding

The result of adding A and B.



6.5.10. Subtracting

The result of subtracting A and B.



6.5.11. Multiplying

The result of multiplying A and B.



6.5.12. Dividing

The result of dividing A and B.



6.5.13. Pick Random

Randomly pick from a range of values.



6.5.14. Equal

Whether or not condition A is equal to condition B is true.



6.5.15. Greater than

Whether or not condition A is greater than condition B is true.



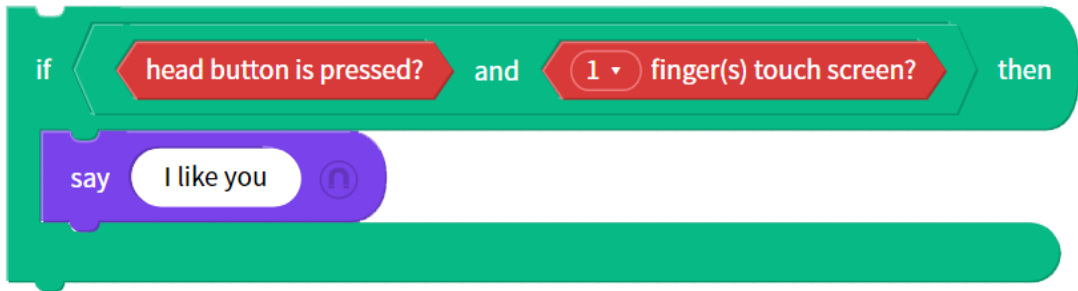
6.5.16. Less Than

Whether or not condition A is less than condition B is true.



6.5.17. And, Both Conditions are True

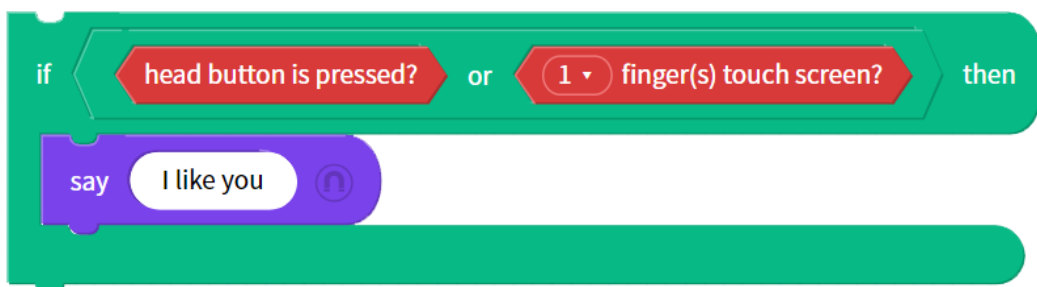
Run the following blocks when both conditions stand true.



If both the head button pressed and finger touches screen, say "I like you." Check both conditions when running the "If" block.

6.5.18. Or, Either Condition is True

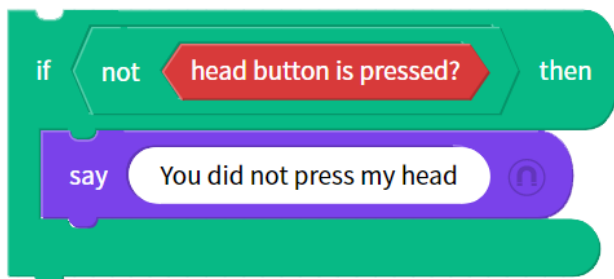
Run the following blocks when either condition stands true.



If the head button is pressed or finger touches the screen, say "I like you." Check both conditions when running the "If" block.

6.5.19. Condition is Not True

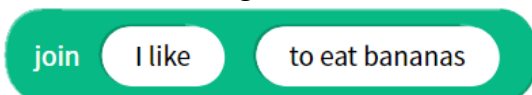
Run the following blocks if the conditions are not satisfied.



If the head button is not pressed, say "You didn't press my head."

6.5.20. String Combination

Combine two strings into one.



The new string result is "I like to eat bananas."

6.5.21. Which Letter in the String

What is the letter in the string?

letter 3 of I love apple

The third letter of the string "I love apple" is "l."

6.5.22. Length of the String

How many letters are in the string?

length of I love apple

There are 12 letters in the string "I love apple." The stored value in this example is 12, which can be used as a numeric variable.

6.5.23. Does the String Contain

I love apple contains apple ?

This condition is true since the string "I love apple" contains apple?

6.5.24. Remainder of A divided by B

Use the remainder of A divided by B.

mod

6.5.25. Other Mathematical Operations

Use the result of mathematical operations.

Mathematical operations include: rounding off, absolute values, round up, round down, square root, sin, cos, tan, asin, acos, atan, ln, log.

round ▾ of

6.6.Sensors

6.6.1. Battery Level

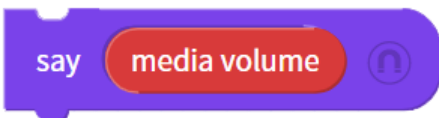
Zenbo Junior' s current battery level (percentage).



If Zenbo Junior's battery level is less than 50%, then say "I am hungry." Else, say "I am full."

6.6.2. Media Volume

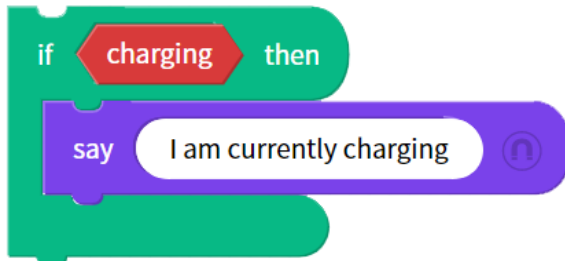
Value of the media volume ranging from 0 to 100.



Say the current media volume.

6.6.3. Charging?

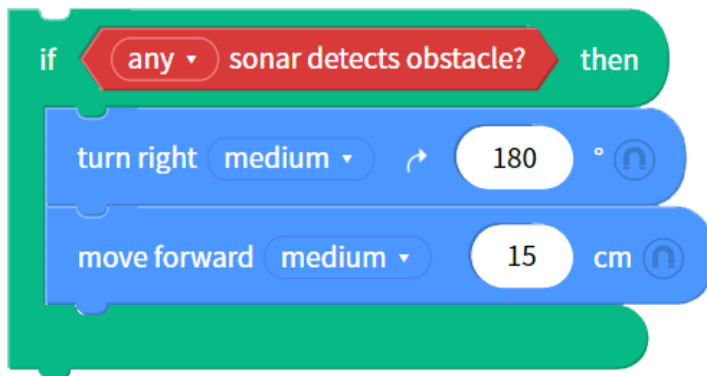
Is Zenbo Junior currently charging? If yes, the result of this condition is true.



If Zenbo Junior is currently charging, say "I am currently charging."

6.6.4. Sonar Detects Obstacle

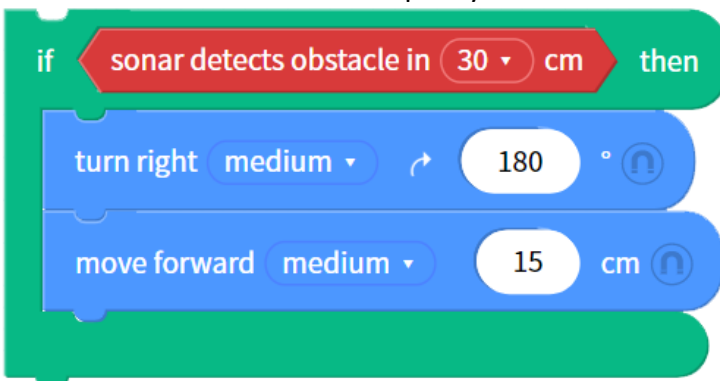
You can set the sonar sensor obstacle detection. Whether there is an obstacle or not in from the middle, left, right, or in any direction. If yes, the result of this condition is true.



Zenbo Junior will turn around and move forward 15 cm if an obstacle is detected in any direction.

6.6.5. Sonar Detects Obstacle From a Distance

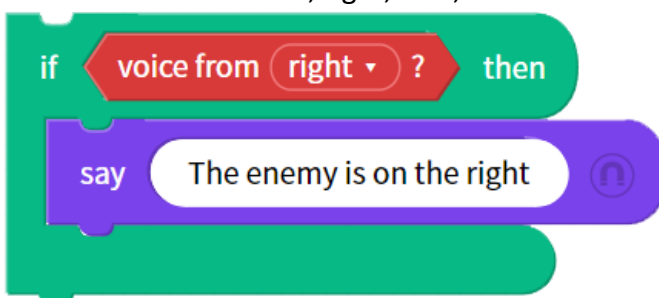
You can set the distance the sonar sensor detects obstacles. If yes, the result of this condition is true. You can specify a 5cm distance interval from 30-60cm.



If the sonar sensors detect an obstacle within 30cm, Zenbo Junior will turn around and move forward 15 cm.

6.6.6. Direction of Sound Source

When running this block, Zenbo Junior's blue ears will appear for a second and detect the direction of the sound source. You can specify whether the sound source is from the front, right, rear, or left of Zenbo Junior.



If the sound source is from the right, say "The enemy is on the right."

6.6.7. Angle of Sound Source

When running this block, Zenbo Junior's blue ears will appear for a second and detect the direction of the sound source. The angle of the

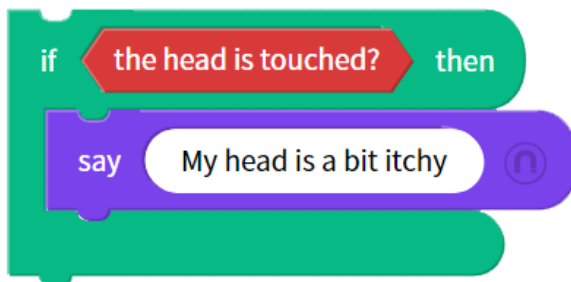
sound source from the front is 0 degrees, from the right is 90 degrees, from the rear is 180 degrees, and from the left is 270 degrees. The angle of sound source ranges from 0 to 359 degrees.



Turn towards the direction of the sound source.

6.6.8. Head is Touched?

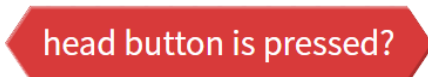
Zenbo Junior can detect whether or not the head has been touched. If yes, the result of this condition is true.



If the head is touched, say "My head is a bit itchy."

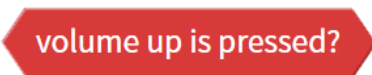
6.6.9. Head Button is Pressed?

Zenbo Junior can detect whether or not the head button has been pressed. If yes, the result of this condition is true.



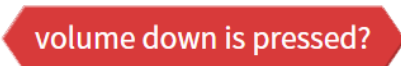
6.6.10. Volume Up Button Pressed?

Zenbo Junior can detect whether or not the volume up button has been pressed. If yes, the result of this condition is true.



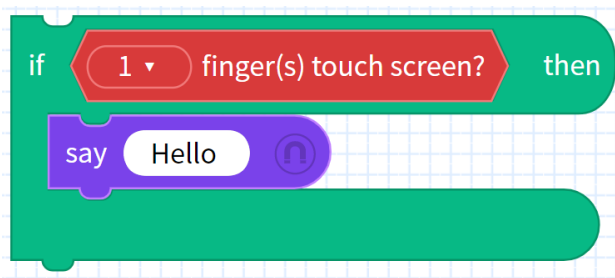
6.6.11. Volume Down Button Pressed?

Zenbo Junior can detect whether or not the volume down button has been pressed. If yes, the result of this condition is true.



6.6.12. (Number) Finger(s) Touch Screen?

Zenbo Junior can detect whether or not the head has been touched. If yes, the result of this condition is true. The number of touches can be specified, from 1 to 10 points at the same time.

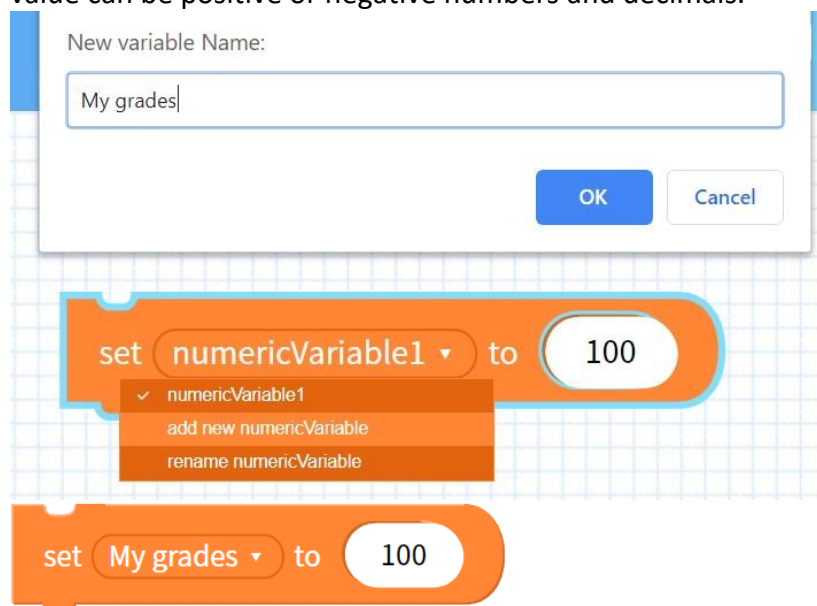


If the face is touched at one point, say “Hello. If the face is touched at two points, robot won’t say a word.

6.7.Variables

6.7.1. Setting Numeric Variables

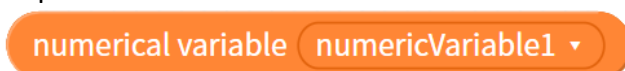
The value of numeric variables must be numbers and used for calculation. It cannot contain text or symbols. You can set the numeric variable name and the value can be positive or negative numbers and decimals.



Add a new numeric variable called “My grades” and set the value as 100.

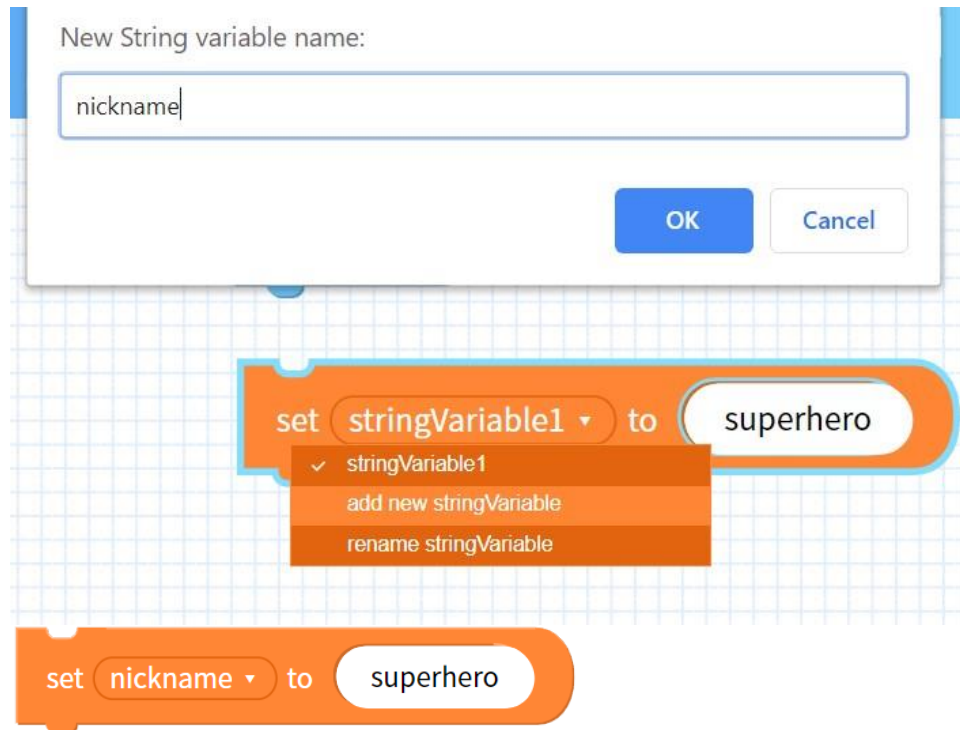
6.7.2. Numeric Variable

The value of numeric variables must be numbers and can be used for calculation or placed in other blocks. It cannot contain text or symbols.



6.7.3. Setting String Variables

The value of string variables must be text or symbols. You can set the name of the string variable using Chinese, English, numbers, spaces, commas, exclamation points, periods, and question marks. You cannot use other special characters.



Add a new string variable called "nickname" and set the value as superhero.

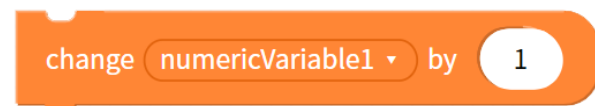
6.7.4. String Variable

The value of string variables must be text or symbols. It can be placed in other blocks.



6.7.5. Change Numeric Variable

You can set to increase or decrease the numeric variable. If a positive number is entered, the numeric variable will increase. If a negative number is entered, the numeric will decrease.



7. Smart Speech Block

7.1.Say

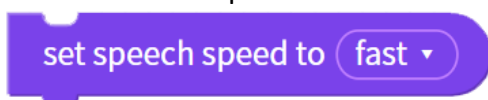
Enter the phrase or sentence you want Zenbo Junior to say.



Say "Hello."

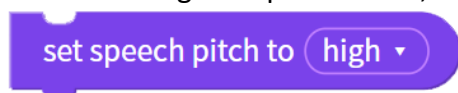
7.2.Adjust the Speaking Speed

There are three speeds that can be adjusted: slow, normal, and fast.



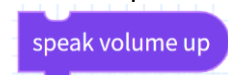
7.3.Change the Speaking Pitch

You can change the pitch to low, normal, or high.



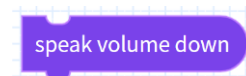
7.4.Speak Volume up

Volume up when speak, without affecting the volume of multimedia.



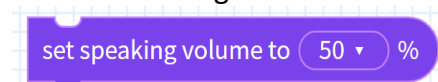
7.5.Speak Volume down

Volume down when speak, without affecting the volume of multimedia.



7.6.Set speaking volume to fixed percentage

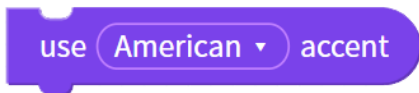
Use the drop-down menu to set a fixed percentage of the speaking volume without affecting the volume of multimedia.



7.7. Accents

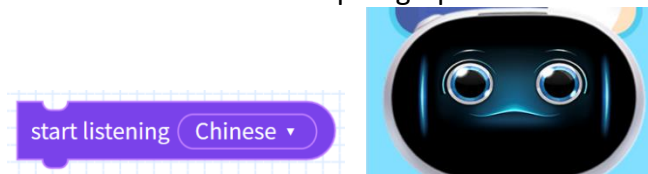
When using the Chinese accent to speak English, Zenbo Junior may sound less smooth when speaking; however, you can include both Chinese characters and English words in the same sentence. If you set Zenbo Junior to speak using the American accent, you can only enter English words. If you mix Chinese characters

and English words in the same sentence while using the American accent, Zenbo Junior will not say the Chinese characters.



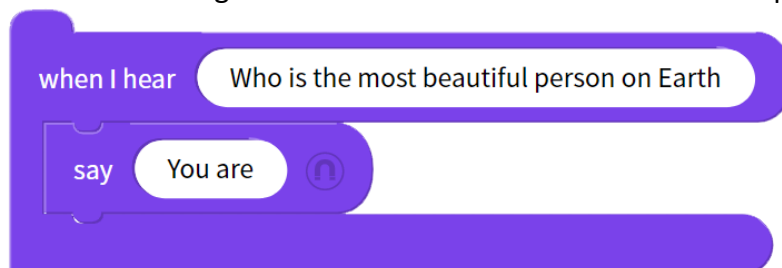
7.8. Start Listening

When talking to Zenbo Junior, in addition to using the wake-up word Hey Zenbo!" to wake up the ears, you can also use the blocks to specify the timing of opening the ears and tell him when to start listening. When the ears are opened, blue ears appear on the face Shine, and keep listening and waiting. If no one speaks to it, the ears will close after about 6 seconds. If someone speaks to it, the ears will be closed after the sentence paragraph is finished.



7.9. When I Hear

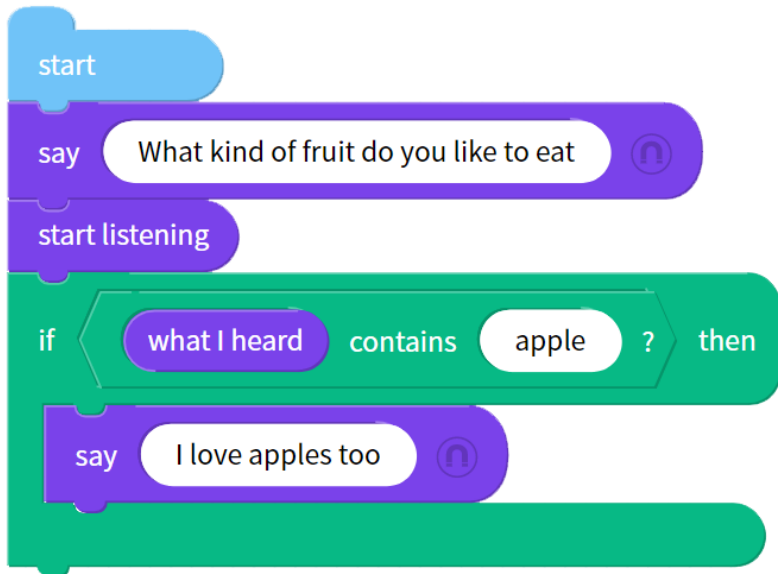
Run the following blocks when the Zenbo Junior hears the specified statement.



Whenever Zenbo Junior hears "Who is the most beautiful person on Earth," Zenbo Junior will say "You are."

7.10. What I Heard

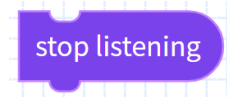
Record what Zenbo Junior heard



Zenbo Junior asks what kind of fruit you like to eat. If the answer contains apple, then Zenbo Junior will say "I love apples too."

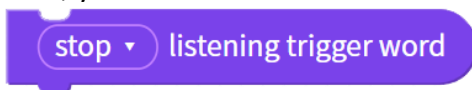
7.11. Stop Listening

Forcibly close the open ears.



7.12. Turn off Trigger Word

The blue ears can be opened with the trigger word "Hey Zenbo!" to let Zenbo Junior start listening, but when Zenbo Junior is expected to not be disturbed by the outside world or other people use the trigger word to open the ears. At this time, you can use this block to close trigger word function.



8. Line Following Blocks

The line-following function is to walk along the black line and read the color information on the line. When you want to customize the line-following map, the recommended width of the black line is 2.4 cm and the length is unlimited. The minimum recommended value for the color block is width 2.4 cm, 2 cm in length.

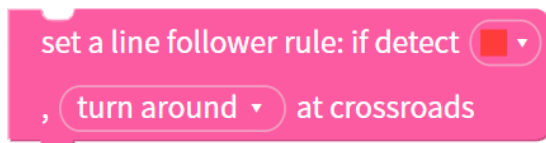
8.1. Start Following the Line

This block turns on the line following function. Place Zenbo Junior on a black track after running the block, and it will start to follow it without stopping.



8.2. Setting a Line Follower Rule: Behavior Upon Detecting a Single Color

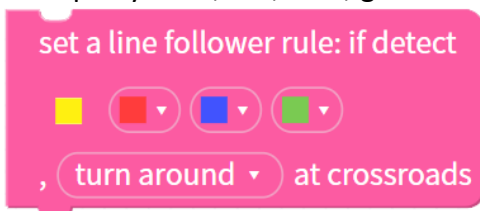
Set the behavior rule for a certain color. Behavior rules will update whenever single colors are detected. The size of a single color patch requires a minimum square size of about 2cm.



When using the line following function, Zenbo Junior will turn around at crossroads upon detecting the color red. And other options are forward, turn left, and turn right.

8.3. Setting a Line Follower Rule: Behavior Upon Detecting a Colored Pattern

Set the behavior rule for a certain colored pattern. Behavior rules will update whenever colored patterns are detected. The size of each color block requires a minimum square size of about 2cm. Colored patterns must start with the system color, yellow. You can add up to three more colors in addition to yellow. For example: yellow, red, blue, green or yellow, red.



When Zenbo Junior is executing line following function, Zenbo Junior will turn around at crossroads upon detecting the colored pattern: yellow, red, blue, green. And other options are forward, turn left, and turn right.

8.4. Setting a Line Follower Rule: Change speed Upon Detecting a Single Color

Set the behavior rule for a certain color. Behavior rules will update whenever single colors are detected. The size of a single color patch requires a minimum square size of about 2cm.

set a line follower rule: if detect  , set speed to 

When using the line following function, Zenbo Junior will move at medium speed upon detecting the color red. And other options are slow and fast. The default speed for following line is medium speed.

8.5. Setting a Line Follower Rule: Change speed Upon Detecting a Colored Pattern

Set the behavior rule for a certain colored pattern. Behavior rules will update whenever colored patterns are detected. The size of each color block requires a minimum square size of about 2cm. Colored patterns must start with the system color, yellow. You can add up to three more colors in addition to yellow. For example: yellow, red, blue, green or yellow, red.

set a line follower rule: if detect     , set speed to 

When using the line following function, Zenbo Junior will move at medium speed upon detecting the colored pattern: yellow, red, blue, green. And other options are slow and fast. The default speed for following line is medium speed.

8.6. Setting a Line Follower Rule: Wait Upon Detecting a Single Color

Set the behavior rule for a certain color. Behavior rules will update whenever single colors are detected. The size of a single color patch requires a minimum square size of about 2cm.

set a line follower rule: if detect  , wait for  seconds

When using the line following function, robot wait for 2 seconds on the spot upon detecting the color red.

8.7. Setting a Line Follower Rule: Wait Upon Detecting a Colored Pattern

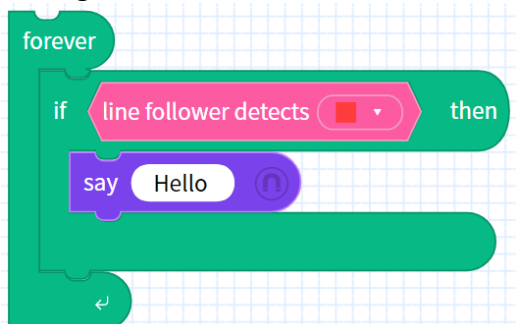
Set the behavior rule for a certain colored pattern. Behavior rules will update whenever colored patterns are detected. The size of each color block requires a minimum square size of about 2cm. Colored patterns must start with the system color, yellow. You can add up to three more colors in addition to yellow. For example: yellow, red, blue, green or yellow, red.



When using the line following function, robot wait for 2 seconds on the spot upon detecting the colored pattern: yellow, red, blue, green. °

8.8. Line Follower Detects Single Color

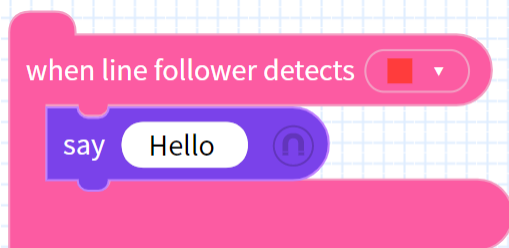
When running this block, Zenbo Junior determines the color detected by the line sensors. Because the color of the ground can only be detected when the building block is running, it is more suitable for use when it is stationary or a large area of the floor area with different colors. If it is to detect small color patches while moving, this method is not suitable.



If the color red is detected, say "Hello." Do this repeatedly.

8.9. When Line Follower Detects Single Color

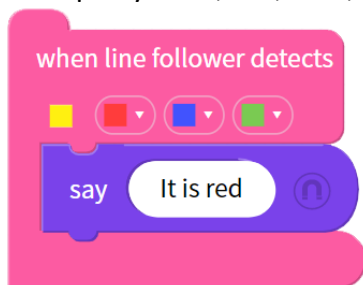
Run the following blocks whenever, red, blue, or green is detected. This block is usually used for functions in addition to line following, such as speaking or moving the head while line following. The size of a single color patch requires a minimum square size of about 2cm.



When line follower detects red, say "Hello."

8.10. When Line Follower Detects Colored Pattern

Run the following blocks whenever a colored pattern is detected. This block is usually used for functions in addition to line following, such as speaking or moving the head while line following. The size of each color block requires a minimum square size of about 2cm. Colored patterns must start with the system color, yellow. You can add one to three more colors in addition to yellow. For example: yellow, red, blue, green or yellow, red.



When line follower detects the colored pattern yellow, red, blue, green, say "It is red."

8.11. Stop Following the Line

Run this block to end the line following function.



9. AI Sensing Blocks

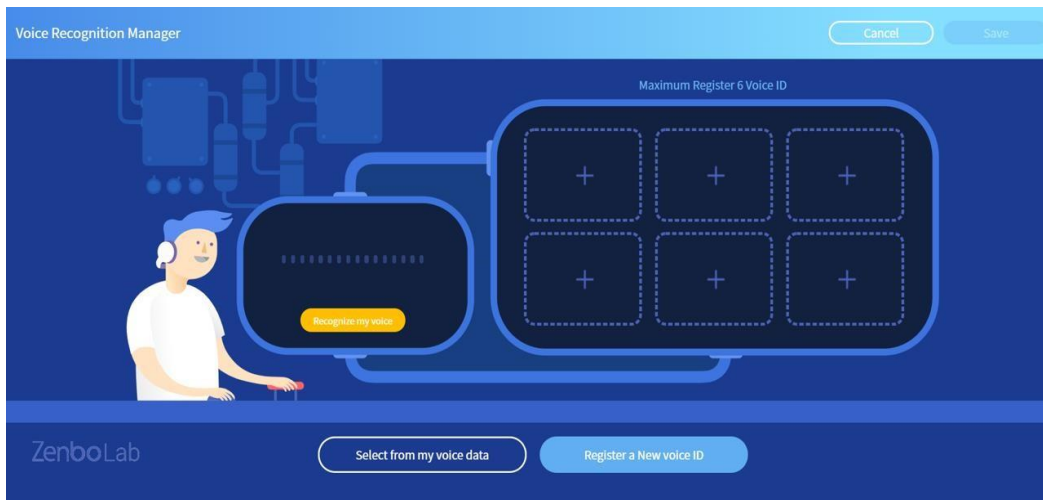
9.1. Speaker Recognition

You must log in to your account to use the voice recognition function. The first time you use voice recognition, you will need to give permission to use the microphone. To identify the speaker, you must open Zenbo Junior's ears. Voice recognition related blocks analyze the voices heard the last time the ears were opened.

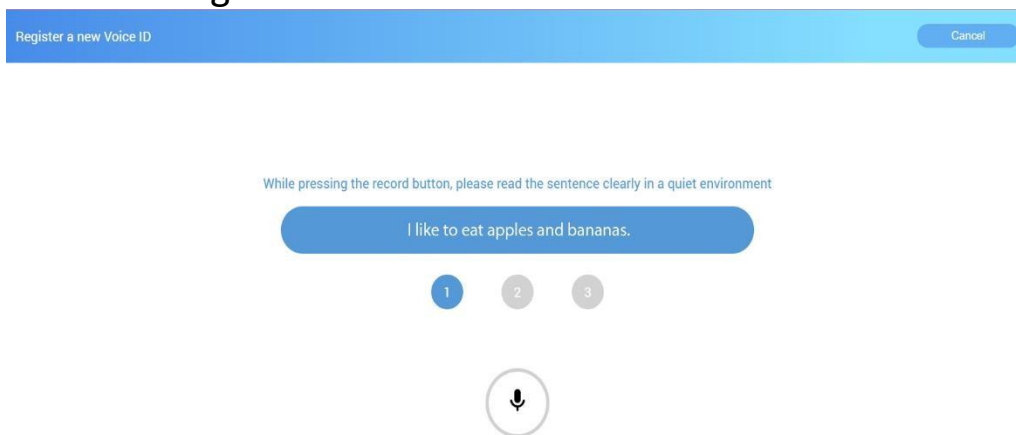
9.1.1. Manage Speaker Recognition



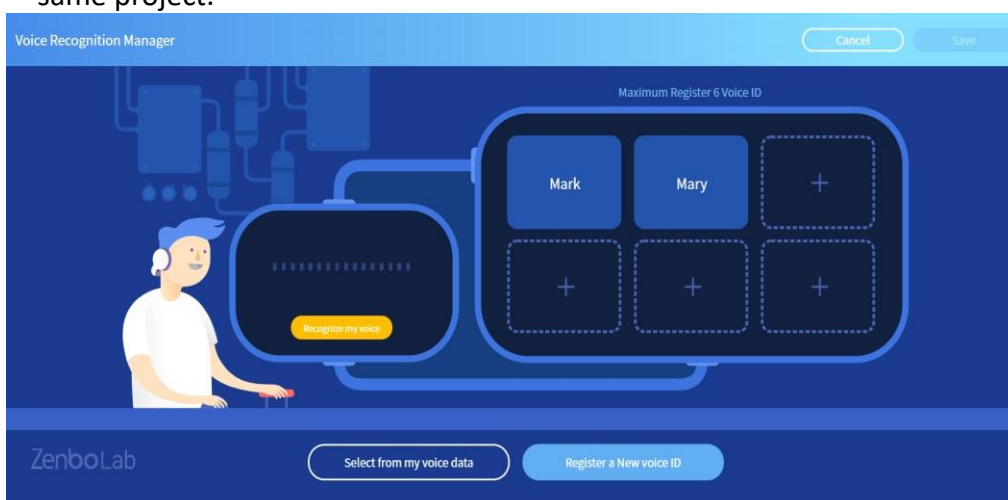
Click to register and manage your Voice IDs in the Voice Recognition Manager screen. You can register up to 6 Voice IDs per project. After registering the Voice ID, you can test it in the management screen by clicking "Recognize my voice" and speaking into the computer microphone.



9.1.2. Register Voice ID

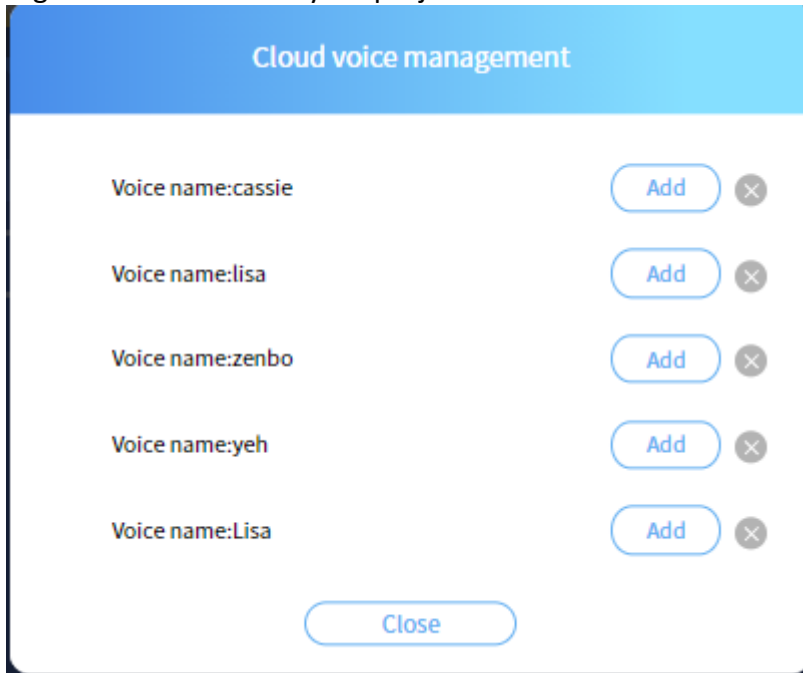


Click the plus icon or “Register a new Voice ID” to create a new Voice ID. Every time you register a new Voice ID, please follow the steps shown and record reading the three sentences. The microphone button must be pressed while recording. Add a name after you finish registering. The names must be different for each Voice ID used in the same project.



9.1.3. Select from My Voice Data

Each time you register a new Voice ID, it automatically uploads to the database. Each account can have up to 10 Voice IDs in the database. If you have created more than 10 Voice IDs, you will need to manually delete some from the database. You can click "Select from my voice data" to add, previously registered Voice IDs to your project.

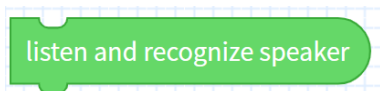


9.1.4. Deleting Voice IDs

Deleting the Voice ID in your project will not affect the data in the database. Click the delete icon to delete it.

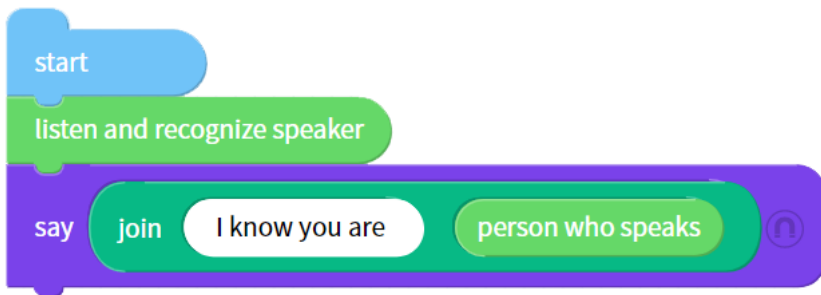
9.1.5. Listen and Recognize Speaker

When you want to use voiceprint recognition, you must first use this and open ears. This block can recognize both a human voice and the content. If you want to use the recognition result, you must use it with other blocks. When this block is simulated on the computer, the microphone will not be turned on, and will only be asked in the simulation area about the results you want to simulate.



9.1.6. Person Who Speaks

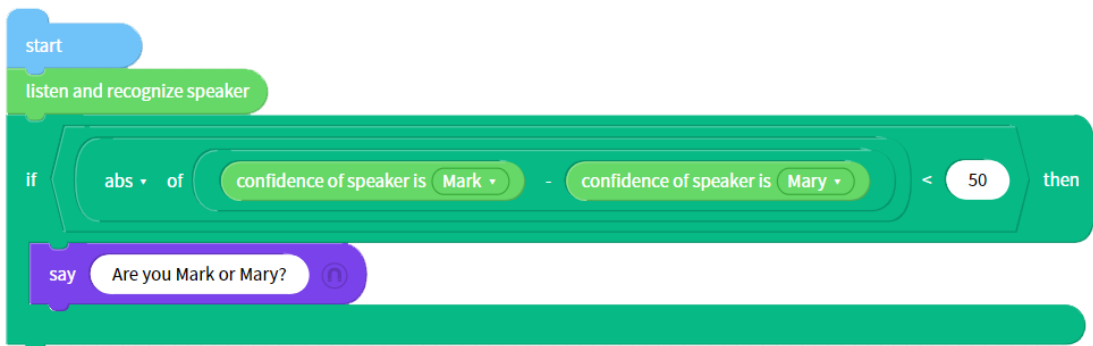
This block identifies the speaker. This variable block will store the name of the speaker as the value. If it is not recognized or is a stranger, the stranger will be reported and stored.



Mark asks Zenbo Junior “Guess, who am I?” Zenbo Junior recognizes that that speaker is Mark and will say “I know you are Mark.”

9.1.7. Confidence of Speaker

This block compares the recorded voice with the 6 Voice IDs in the project; therefore, the following scenarios may occur. The recorded voice is 90% similar to Mark’s voice, but Mark and Matt’s voice sounds similar. So, the recorded voice maybe 80% similar to Matt’s voice as well. Hence, the possibility of the recorded voice is similar to the 6 Voice IDs in the project.

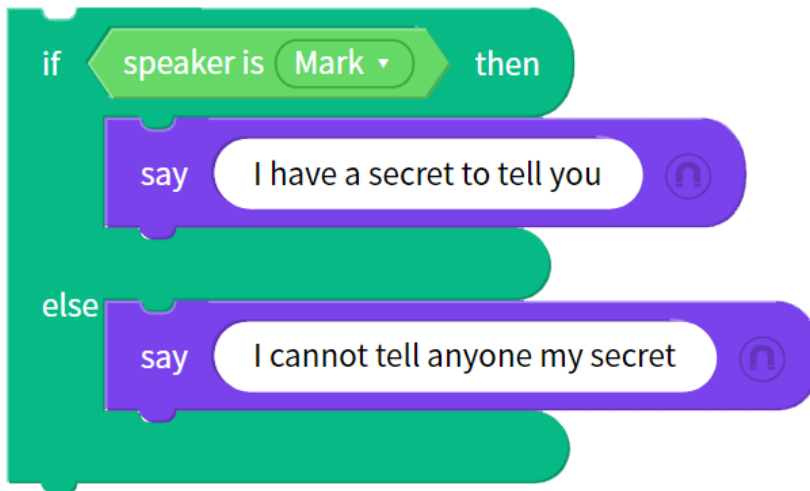


Zenbo Junior says “Hello, how are you?” to Mark and Mary. Mark or Mary responds “I’m doing well.”

If the absolute value of the difference between the possibility of the recorded sound being Mark and Matt is less than 10, then ask “Are you, Mark or Mary?”

9.1.8. Speaker

The result of this block returns whether the conditions are true or false.



If the Speaker is Mark, Zenbo Junior will say “I have a secret to tell you.” Else, Zenbo Junior will say “I cannot tell anyone my secret.”

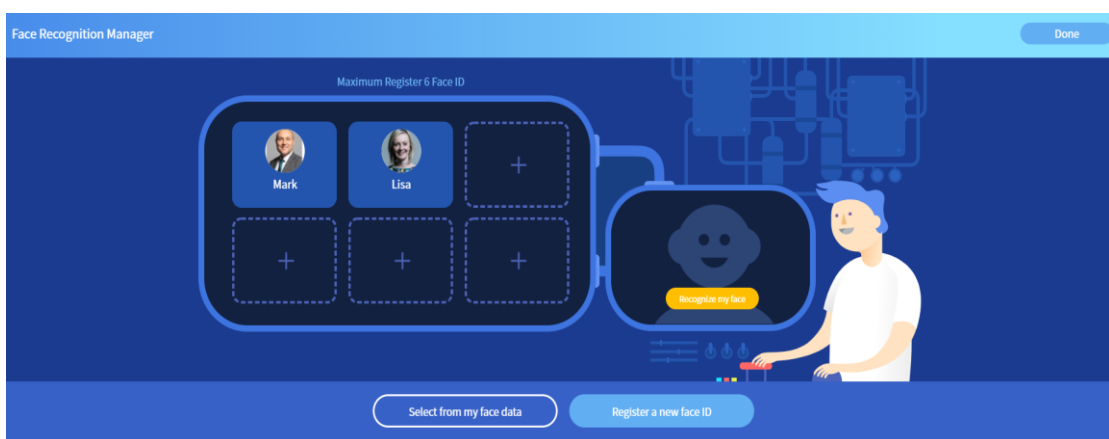
9.2.Face Recognition

You must log in to your account to use the face recognition function. The first time you use face recognition, you will need to give permission to use the camera.

9.2.1. Manage Face Recognition

[manage face recognition](#)

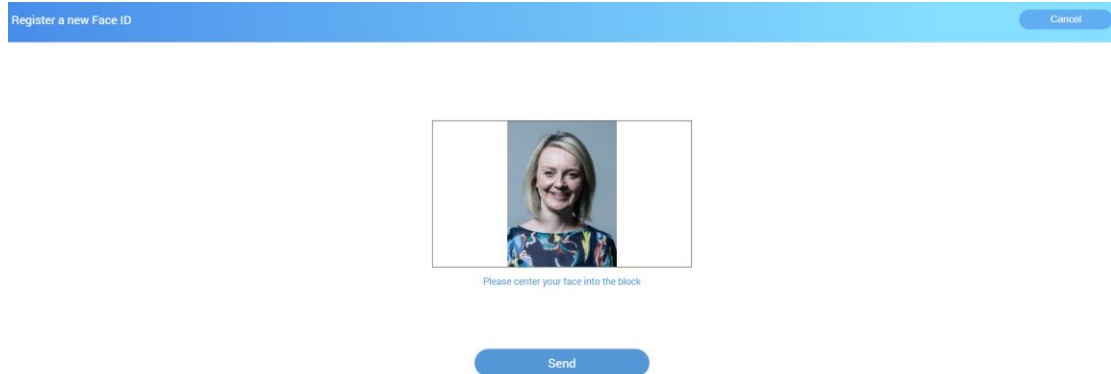
Click to register and manage your face IDs in the face Recognition Manager screen. You can register up to 6 face IDs per project. After registering the Voice ID, you can test it in the management screen by clicking “Recognize my face” and take photo to identify whether it is a registered person or a stranger.



9.2.2. Register Face

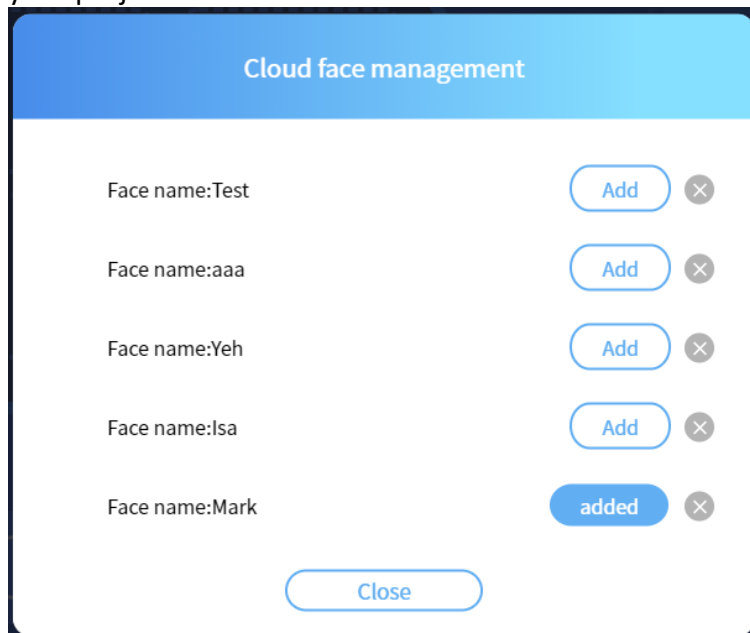
Click the plus icon or “Register a new Face ID” to create a new face ID. Every time you register a new face ID, please follow the steps shown. You can upload a photo

or take a photo with camera. Add a name after you finish registering. The names must be different for each face ID used in the same project.



9.2.3. Select from My Face Data

Each time you register a new face ID, it automatically uploads to the database. Each account can have up to 10 face IDs in the database. If you have created more than 10 Voice IDs, you will need to manually delete some from the database. You can click "Select from my face data" to add, previously registered face IDs to your project.



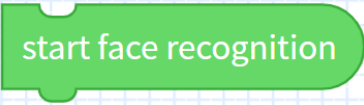
9.2.4. Deleting face IDs

Deleting the face ID in your project will not affect the data in the database. Click the delete icon to delete it.

9.2.5. Start Face Recognition

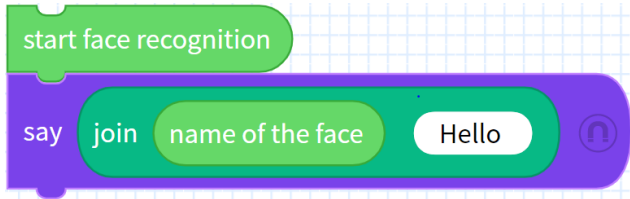
Using this block, you will turn on the camera, take a picture after the countdown three seconds, and start the recognition process. If you want to use the recognition result, you must use it with other blocks. When this block is simulated

on the computer, the camera will not be turned on, and will only be asked in the simulation area about the results you want to simulate.



9.2.6. Name of the Face

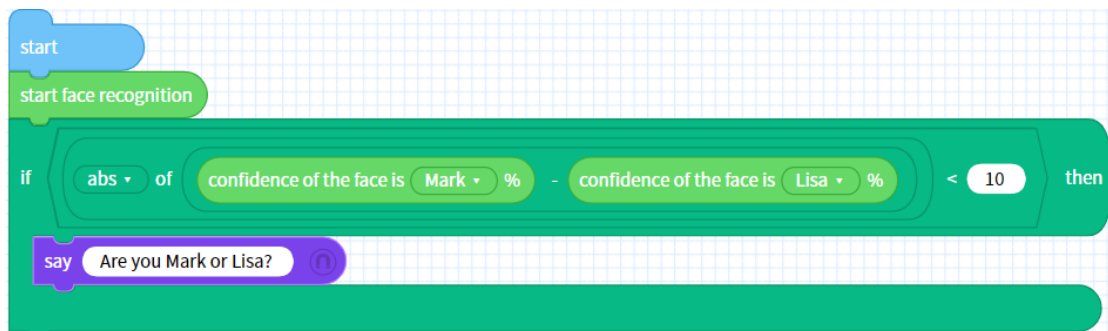
This block identifies the face. This variable block will store the name of the face as the value. If it is not recognized or is a stranger, the stranger will be reported and stored.



Zenbo Junior took a photo of Mark, and recognized him, and then replied: "Hello".

9.2.7. Confidence of Face

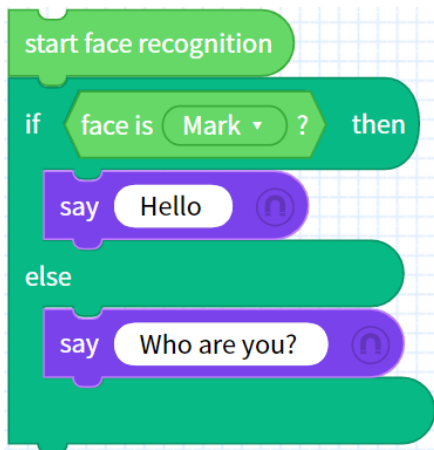
The confidence is not 100% for all people. Face recognition is to compare the included faces with up to six groups of faces specified in the project, so the included faces may have the following situations. The picture taken when taking pictures is not clear. The recognition result is 65% similar to Mark's face, but 60% is similar to Lisa as well.



Zenbo Junior took an identification photo. The person in the photo may be Mark or Lisa. If the absolute value of the subtraction of Mark and Lisa's confidence is less than 10, it means that the identification result may not be correct and you can use it Zenbo Junior to say: "Are you Mark or Lisa?"

9.2.8. Face Recognition

The result of this block returns whether the conditions are true or false.



If the face is Mark, Zenbo Junior will say “Hello” Else, Zenbo Junior will say “Who are you?”

9.3. Following Object

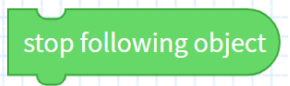
9.3.1. Start Following Object

After this function is activated, you can place any object in front of Zenbo Junior’s stomach where the sonar sensors are for Zenbo Junior to follow it. If the object moves forward or changes direction, Zenbo Junior will do the same.



9.3.2. Stop Following Object

Run this block to stop following object.



10. Error Messages and Troubleshooting

10.1. When Running on Zenbo Junior

10.1.1. Possibility of Falling

Zenbo Junior can detect a height difference when he is too close to the edge of a table, desk, or counter. In these situations, for safety precautions, Zenbo Junior will stop executing the project. Please place Zenbo Junior in a safe area before running the project.

10.1.2. Micro-USB Cable

If there is a cable connected to Zenbo Junior's micro-USB port, all movements and rotations cannot be performed. Please remove the cable for Zenbo Junior to move or rotate.

10.1.3. Charging

If the power cable is connected to Zenbo Junior, all movements and rotations cannot be performed. Please remove the cable for Zenbo Junior to move or rotate.

10.2. Editing in Zenbo Lab

10.2.1. Opening Projects with Different Accounts

If you would like to edit a project that uses AI sensing blocks such as voice recognition, you will need to be the project creator and owner to be able to do so. However, you can open the project to view the contents in read-only mode without being the project creator or owner. All blocks and settings cannot be modified.

10.2.2. Account Logout

If you login to Zenbo Lab on a different computer, the old device you were logged into will automatically log out.

10.2.3. Login to Account to Use AI Sensing Blocks

You can only view or use the AI sensing blocks when logged into Zenbo Lab. Please log in or create an account to use these blocks.

10.2.4. Value Exceeds Limit

Some blocks have upper and lower limits of the input values. If the value exceeds the limit, a notification will pop up. Please adjust the input value accordingly.