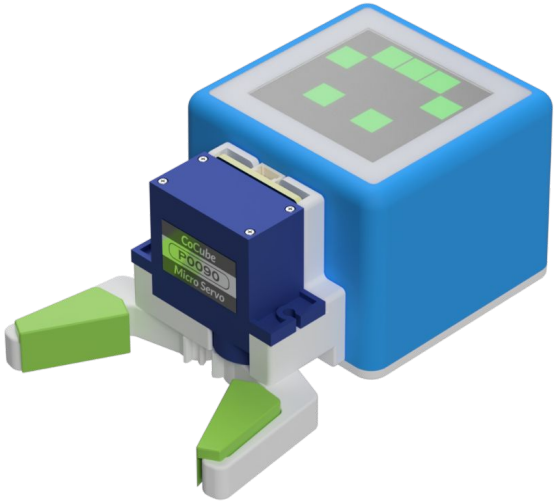
Learn to program tabletop football playing robots



Slides
https://tinyurl.com/cocube25

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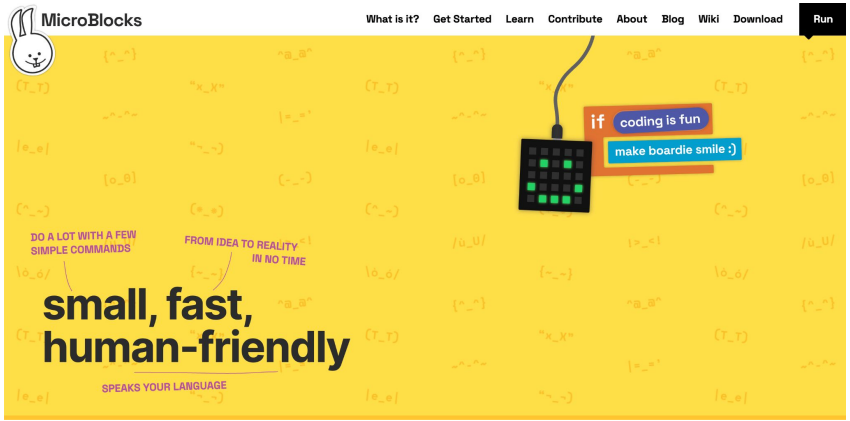
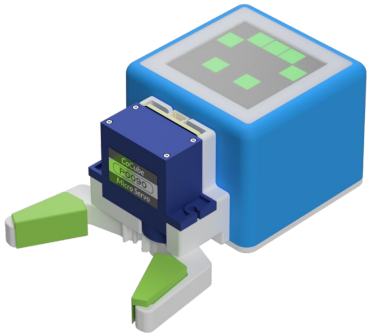
In this introductory, hands-on workshop you will learn how to program **CoCube**, a tabletop modular robot using **MicroBlocks**, a blocks language similar to Scratch.

You will learn how to retrieve the robot's position and orientation in real time using MicroBlocks, how to move the robot to a specified location, how to control the servo gripper to shoot the football, and ultimately complete the tabletop football robot task.

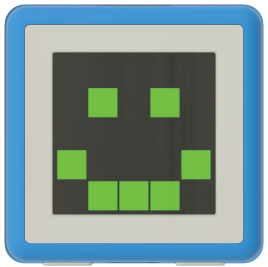


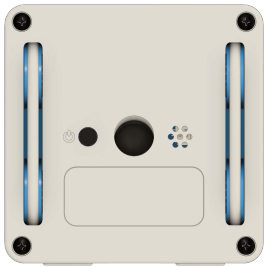


Step 1 | Meet CoCube

CoCube is a tabletop modular robot platform for education and research, featuring wireless communication, screen display, precise movement and accurate positioning!

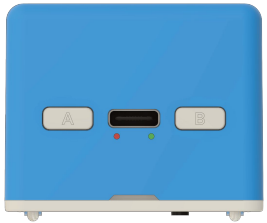
TFT Screen
240 * 240

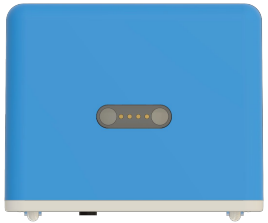




Track Wheels
Buzzer
Power Button — long press for 3s to turn on or off

Button A & B
Red LED — charging
Green LED — power on





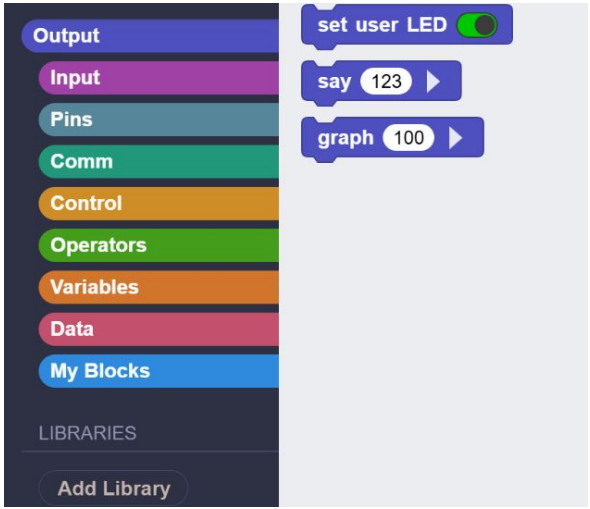
Magnetic Connector
for expanding various CoModules

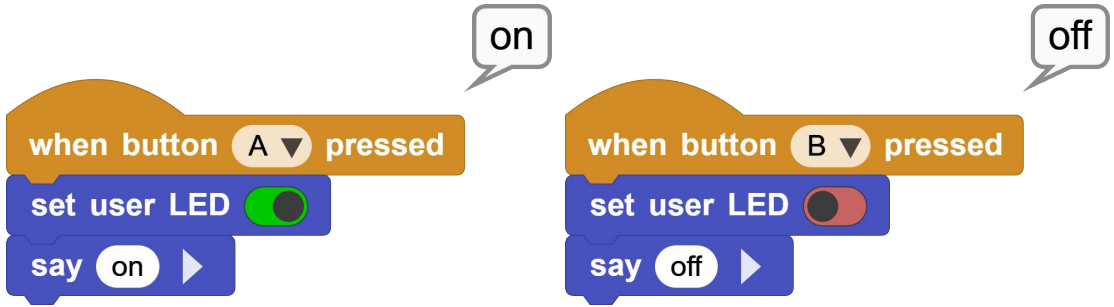
Step 2 | Meet MicroBlocks

MicroBlocks is a blocks programming language for physical computing inspired by Scratch.

Open the MicroBlocks website and connect CoCube via USB or BLE.

https://microblocks.fun/run/microblocks.html





Tips

After disconnection, the program under the “hat block” can still work.

Step 2 | Meet MicroBlocks

Tips: If the serial port cannot be recognized normally, it may be that the computer does not have a serial port driver installed, and the driver for CH343 serial port to USB chip needs to be installed.

MacOS driver:

https://www.wch-ic.com/downloads/CH34XSER_MAC_ZIP.html

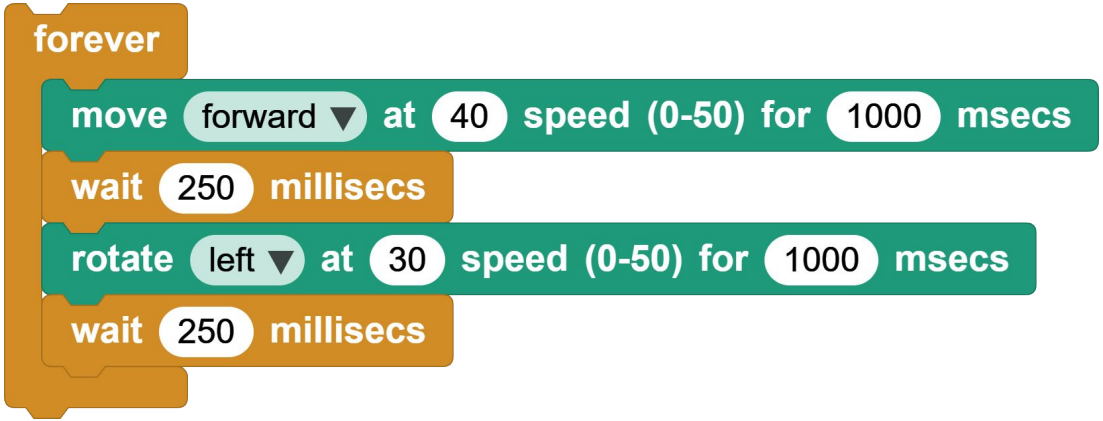
Windows driver:

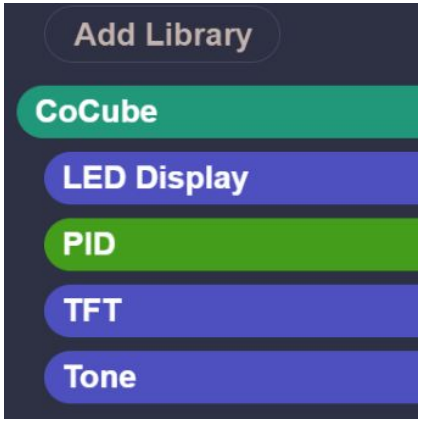
https://www.wch-ic.com/downloads/CH341SER_ZIP.html

Step 2 | Meet MicroBlocks

Add the library of CoCube.

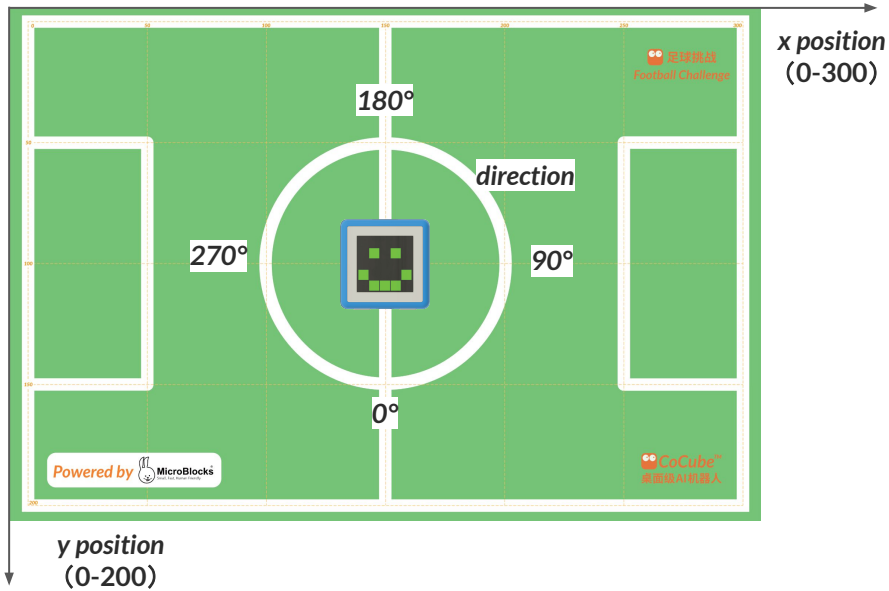
Creative time: let CoCube draw a square and a circle, and explore the functions of LED Display, TFT and Tone!

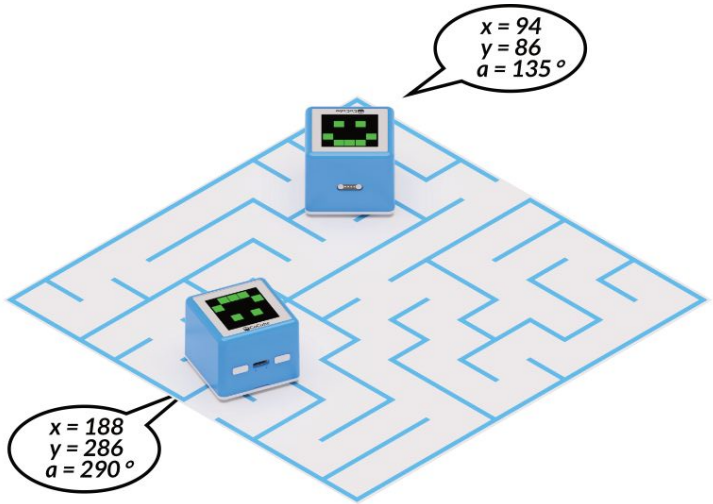




Step 3 | Meet CoMaps

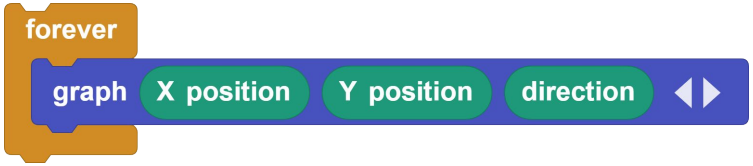
CoMaps uses optical identification technology to print coded microdots on regular paper, providing high-precision, easy-to-deploy positioning capabilities for CoCube robots.



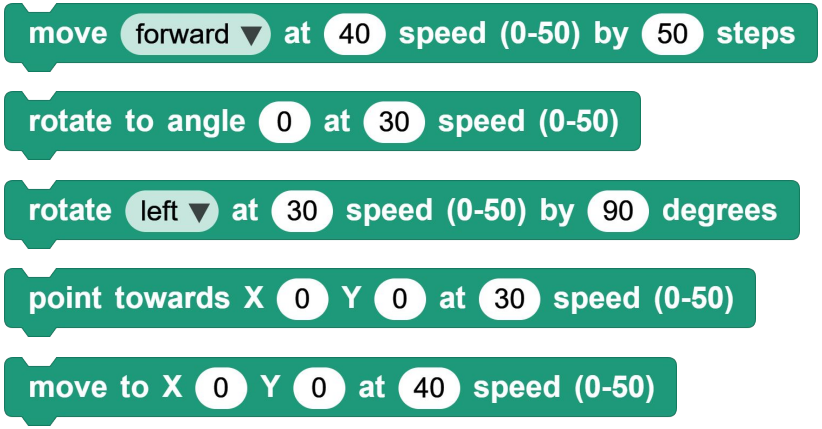


Step 3 | Meet CoMaps

Have a test!



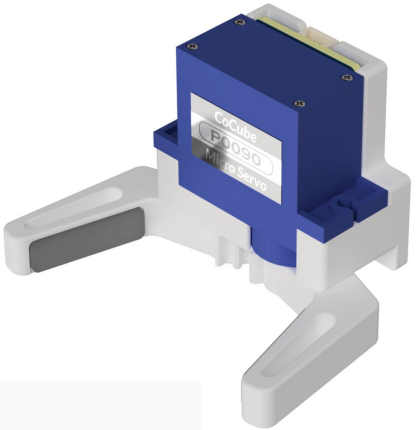
Creative time: try these 5 blocks, let CoCube robot complete more precise movements.



Tips

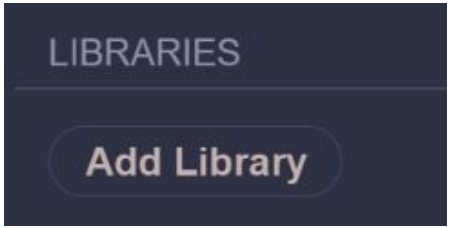
If you are programming with a cable, you can place the blocks under the hat block and unplug the cable before running.

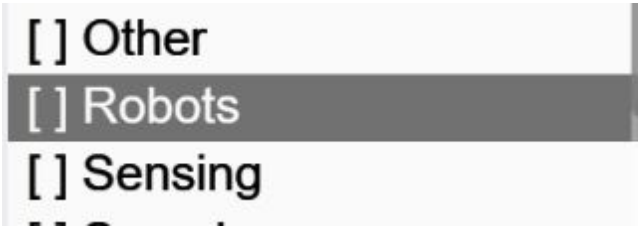
Step 4 | Meet CoModules

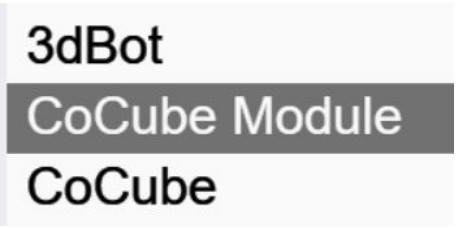


CoModules are a series of magnetic attachment modules designed to expand the functionality of the CoCube robot.

Add the library of CoCube Module.



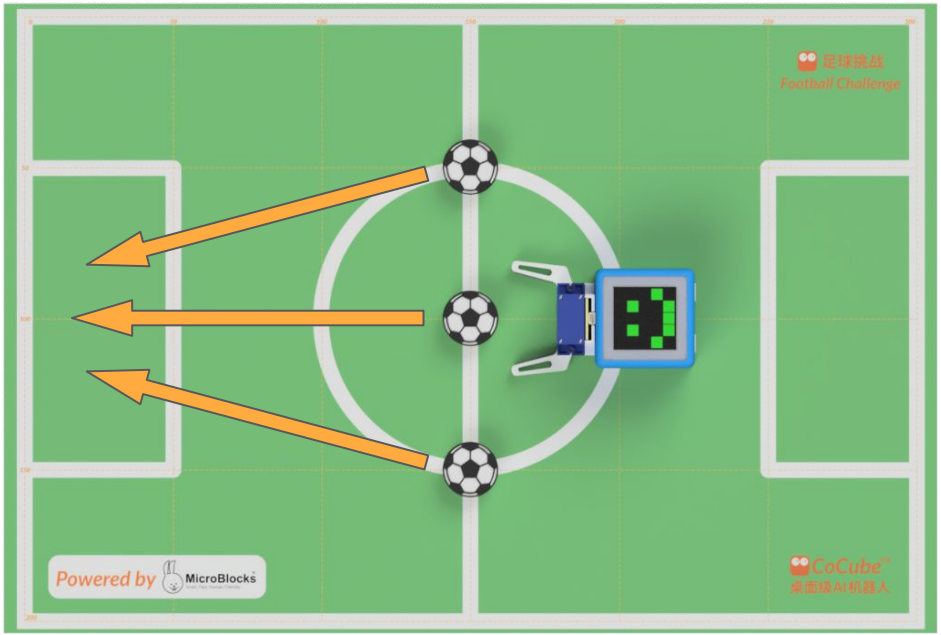




Have a test!

Step 4 | Meet CoModules

Challenge time: start programming and control the CoCube robot to automatically deliver three footballs into the goal as soon as possible.



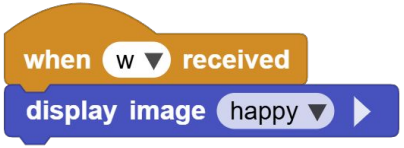
Tips: if the gripper wants to clamp the ball, it is appropriate to set the angle to about 10 degrees.

Step 5 | Advanced Challenge

Remote Control

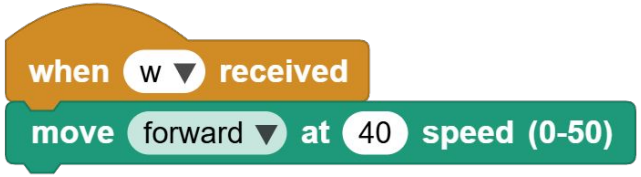
If your computer has **BLE** and you want to remotely control the CoCube like a racing car, you can open this website. https://keyboard.cocube.fun/

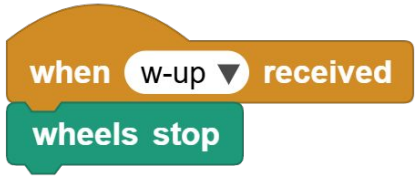
press key “w”
to send “w”



release key “w”
to send “w-up”

You can define how to control the CoCube movement and gripper functions with the keyboard. Demo Code





Step 5 | Advanced Challenge

Football Shot

You can add the small parts to the Gripper so that it can **actually** shoot. Please complete the football challenge again!