

Experiments with Thymio

– *Intelligent Robotic Systems* –

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Setup

Install *Thymio Suite* from www.thymio.org/download-thymio-suite

Programming Thymio robots

Among the possible ways to program Thymio, we will use *Aseba*. Aseba is an event-based architecture for real-time distributed control of mobile robots. Events have an identifier and optional payload data. Aseba nodes can exchange events, and these can be of two types.

- The events that Aseba nodes exchange within an Aseba network are called **global** events.
- The events that are internal to a node are called **local** events. An example of a local event is the one emitted by a sensor that provides updated data.

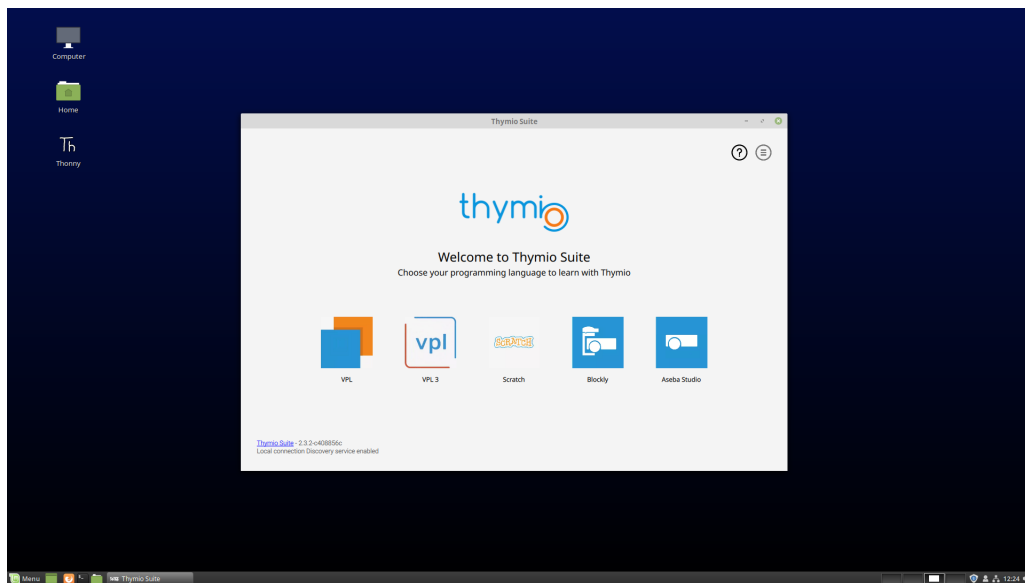
If the code for receiving an event is defined, then the corresponding block of code is executed when the event is received. Code can also emit events, which can trigger the execution of code on another node or enable communication with an external program. To start the execution of related code upon receiving new events, programs must not block and thus must not contain any infinite loops. For instance, in the context of robotics, where a traditional robot control program would do some processing inside an infinite loop, an Aseba program would just do the processing inside a sensor-related event.

See <https://wiki.thymio.org/en:asebalanguage> for a description of Aseba language and its use with Thymio.

See <https://wiki.thymio.org/en:thymioapi> for an illustration of how Thymio sensors and actuators and how to access them via Aseba.

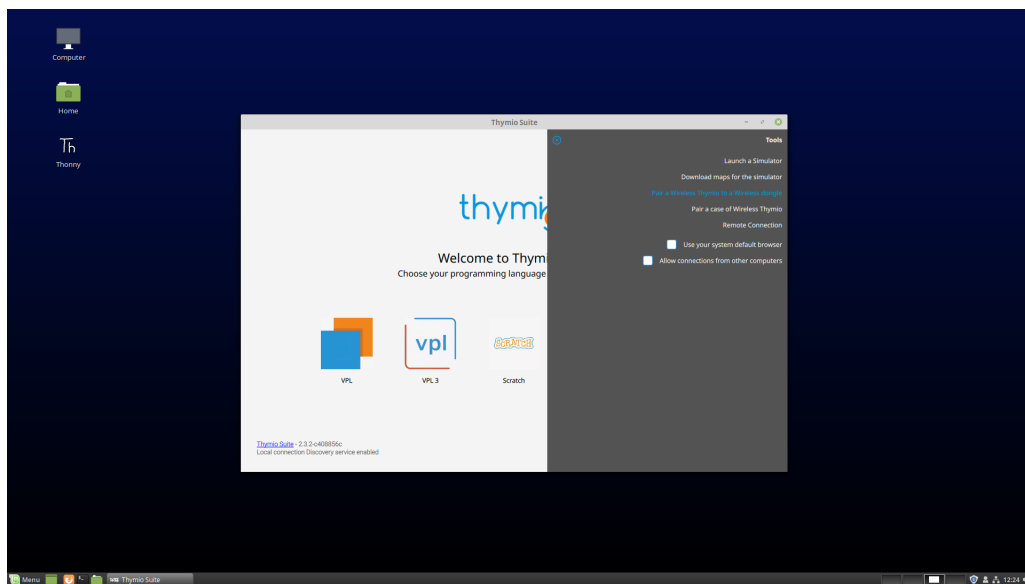
Running Thymio robots

1. Open Thymio Suite

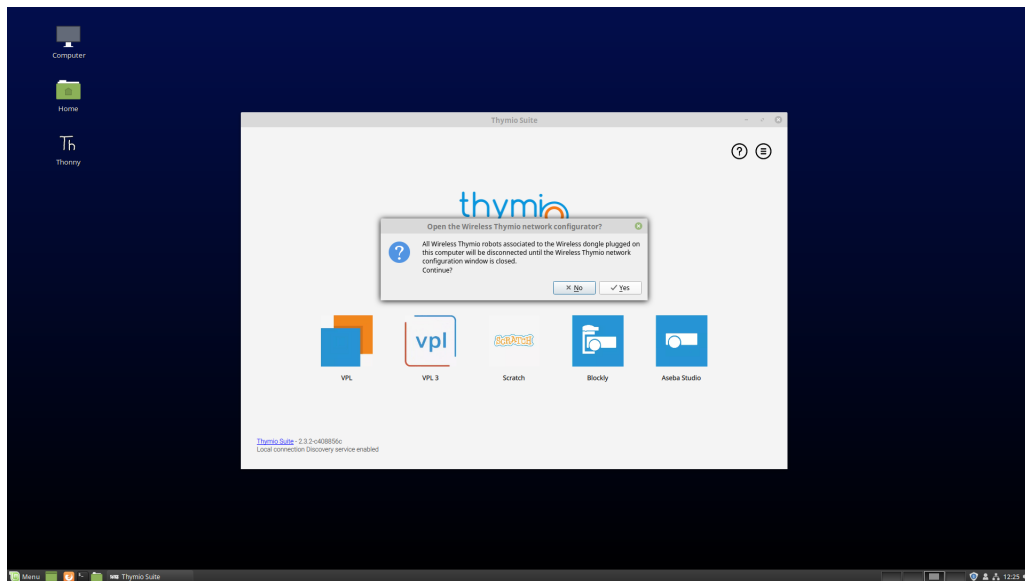


2. Insert USB dongle

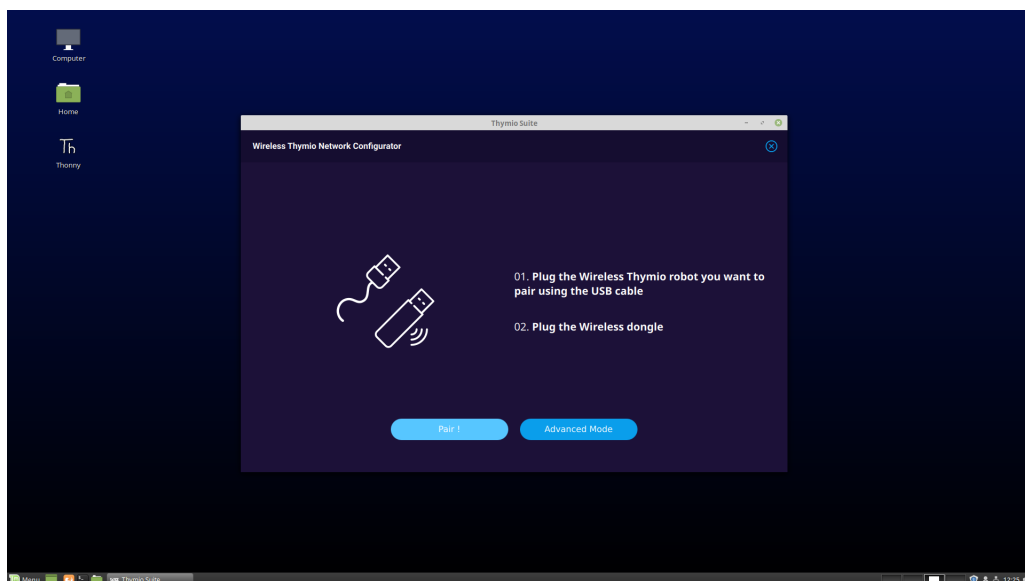
3. Open the menu (top right) and select 'Pair a wireless thymio to a wireless dongle'



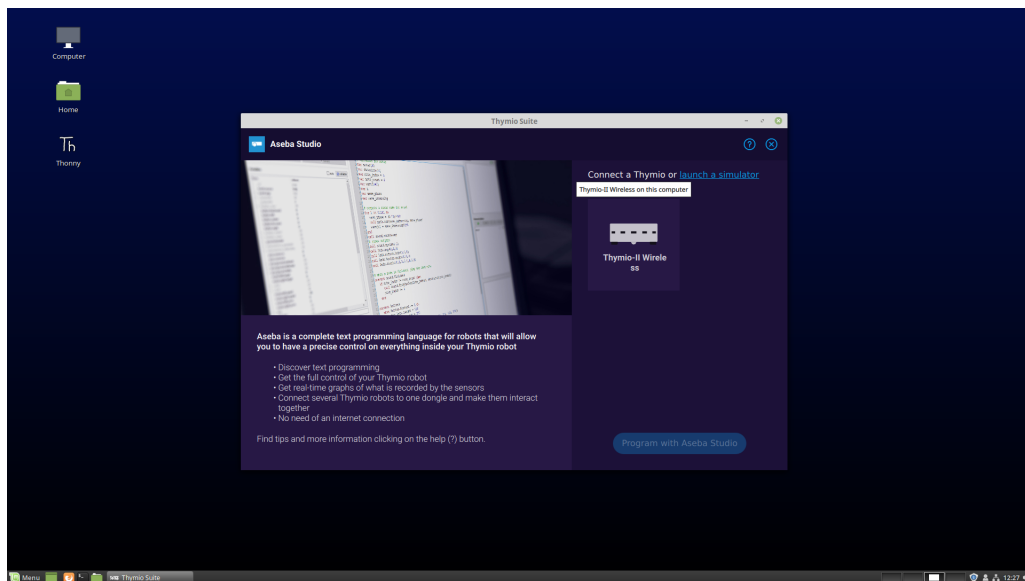
4. Select YES



5. Connect Thymio via the USB cable and select 'Pair!'. Close the **internal** window (see circled X)



6. Open Aseba and select the connected Thymio



Aseba Studio has several panels. The central one is for the code to be run on the robot. The top left one shows the current status of the sensors.

Open the example code you have given: look at its structure (event blocks of code) and run it on the robot.

Now it's your turn

Implement a wandering with collision avoidance using a control structure of your choice (even a Braitenberg-like coding is sufficient). Add also a safety action that stops the robot if it perceives near obstacles (see example code) or it bumps against an other robot (see example code).