



Hour of Code

December 10th, 2020



Featuring



Lindsay Balfour

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Sweden

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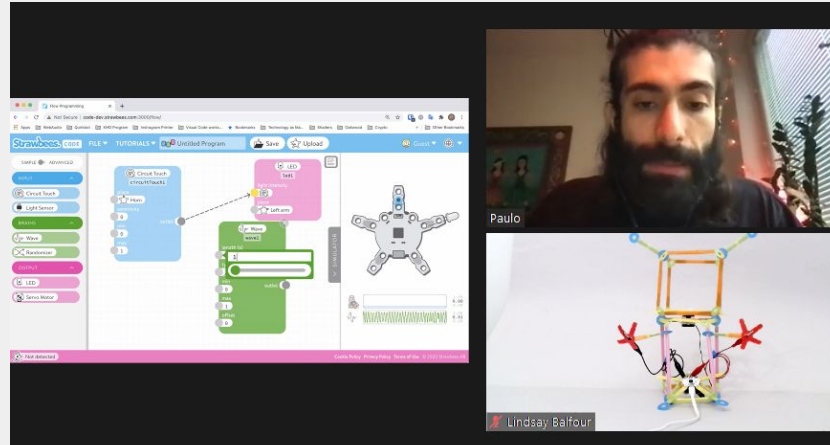


Paulo Barcelos

CTO
Sweden



About



Venture into Flow programming and coding with sine waves using the Friendbot. Learning to code objects more realistically as they usually don't just start and stop instantly, and almost never move at a constant speed. You can participate in this session without a Quirkbot in hand previewing the CODE simulator. Test and execute your programs with the virtual servos and LED hardware and looking at waves.

[Hour of Code](#) is a one-hour introduction to computer science, designed to demystify "code", to show that anybody can learn the basics, and to broaden participation in the field of computer science.

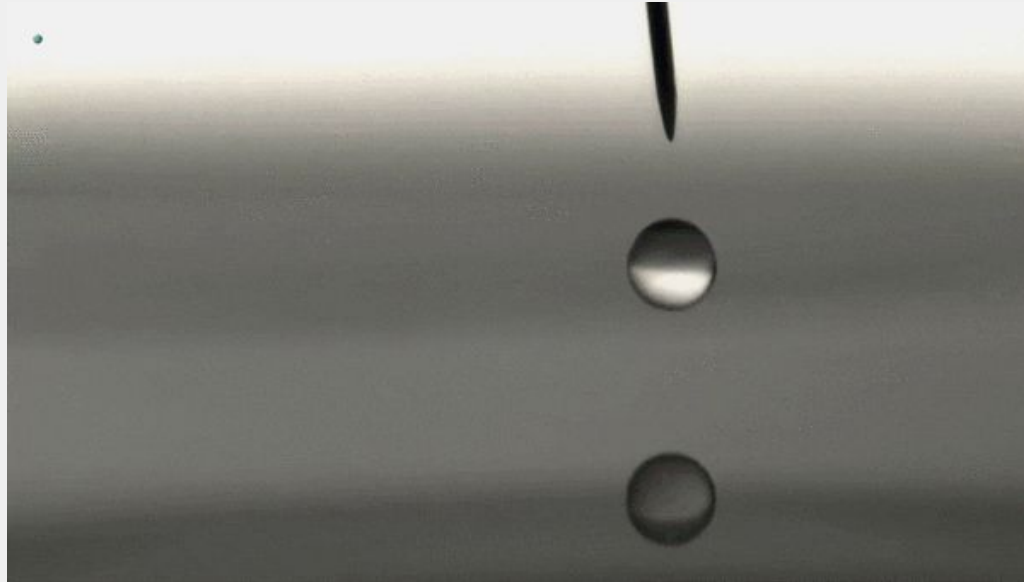
Hour of Code 2020



View Recording Here: <https://youtu.be/2CzG-kGj4CE>

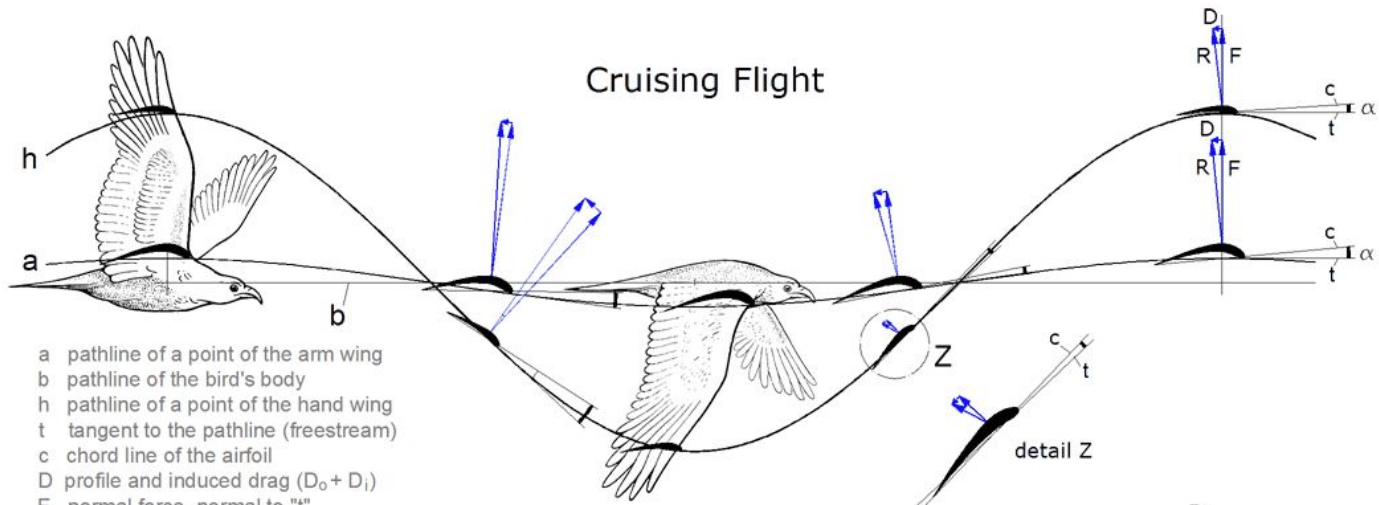
Waves in the Real World

Paulo introducing how we use waves as part of programming and how we see them in the real world. The literal waves of water rippling, to the motion of how a bird's wings flap, to the motion of your hands moving as you stroll.

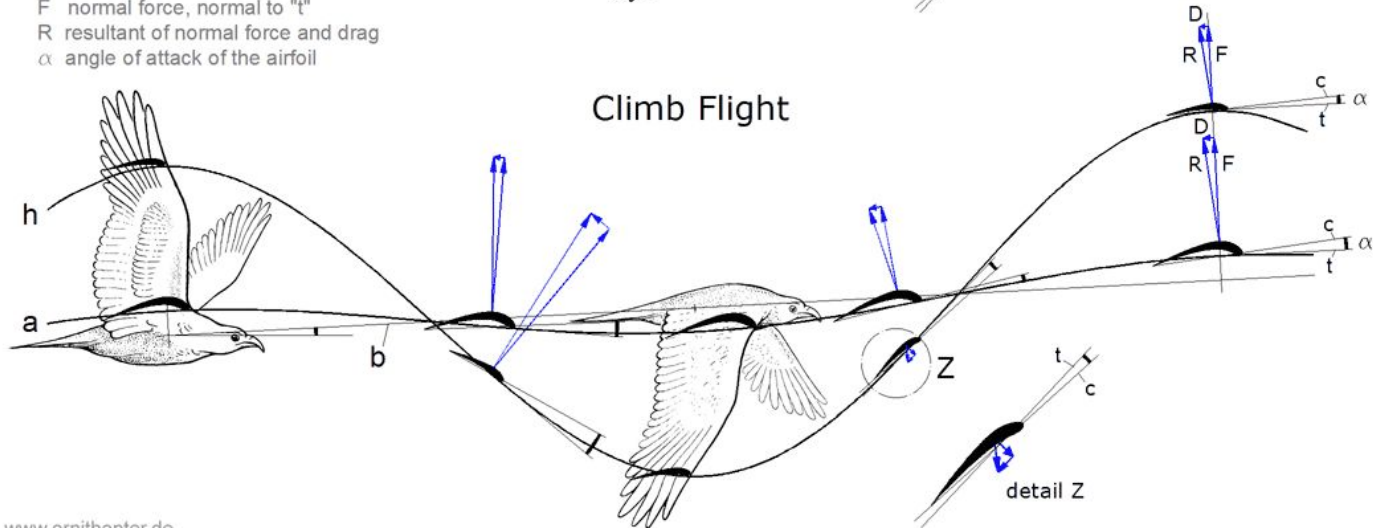


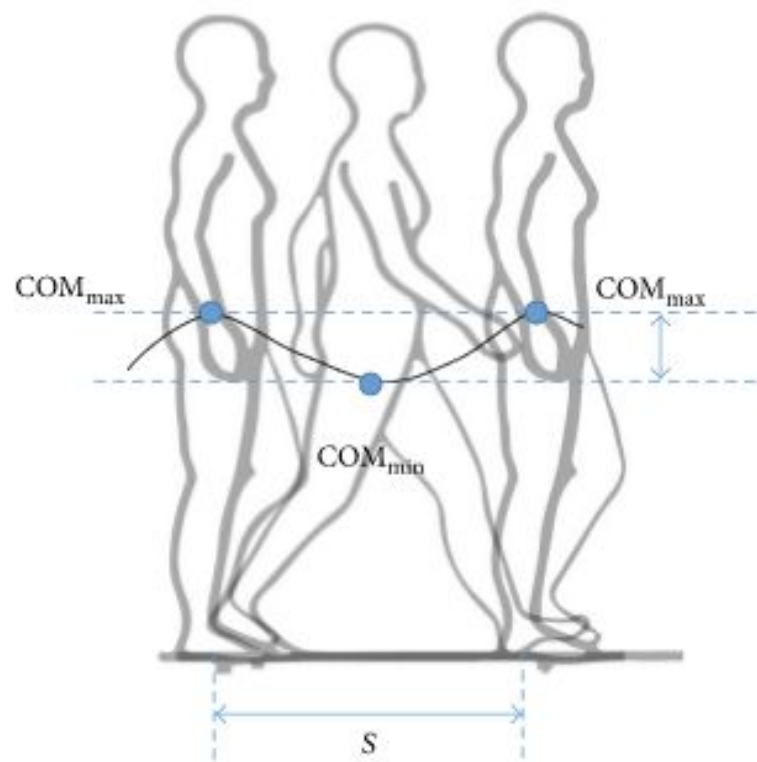


Cruising Flight

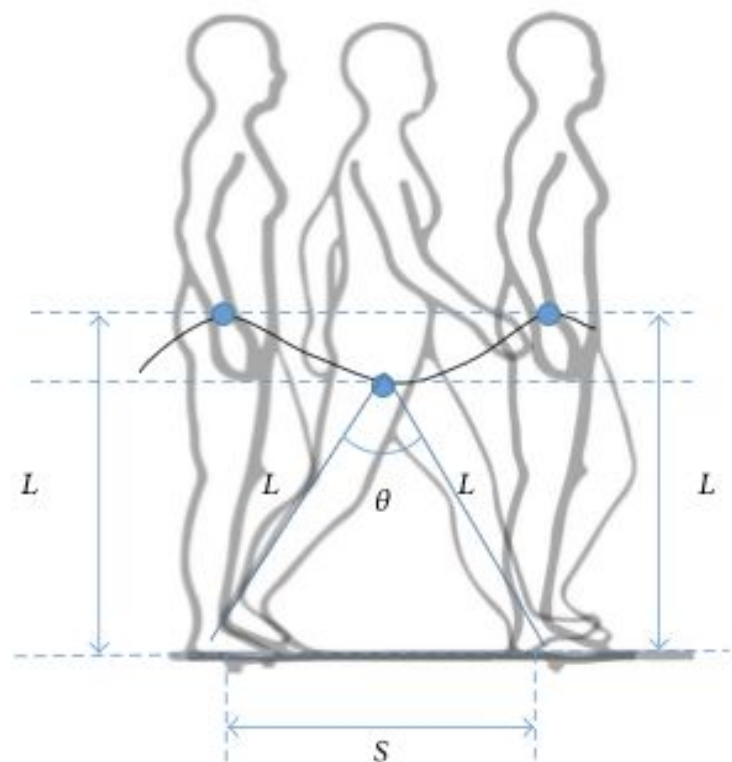


Climb Flight



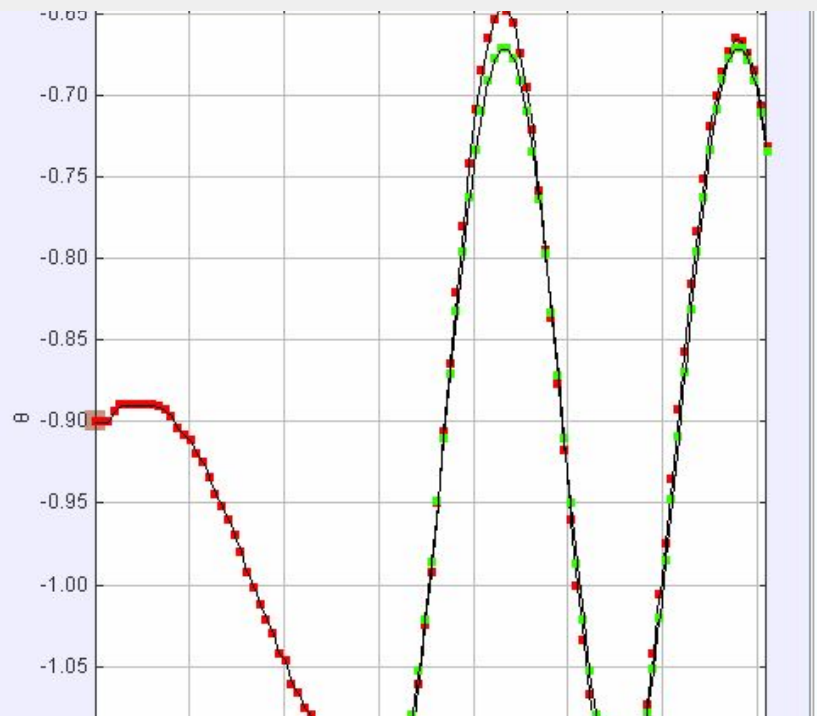
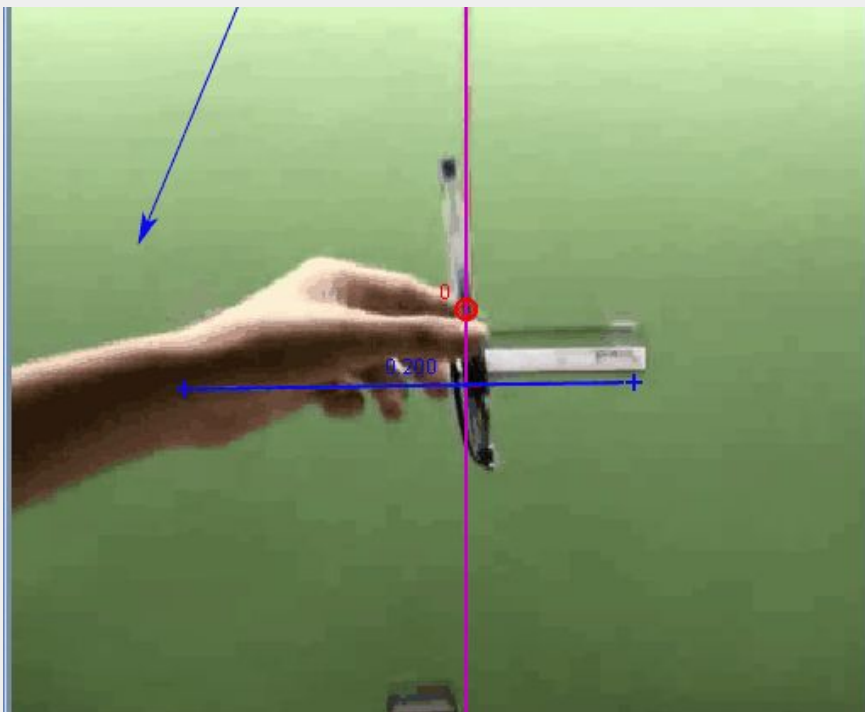


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figuur 2





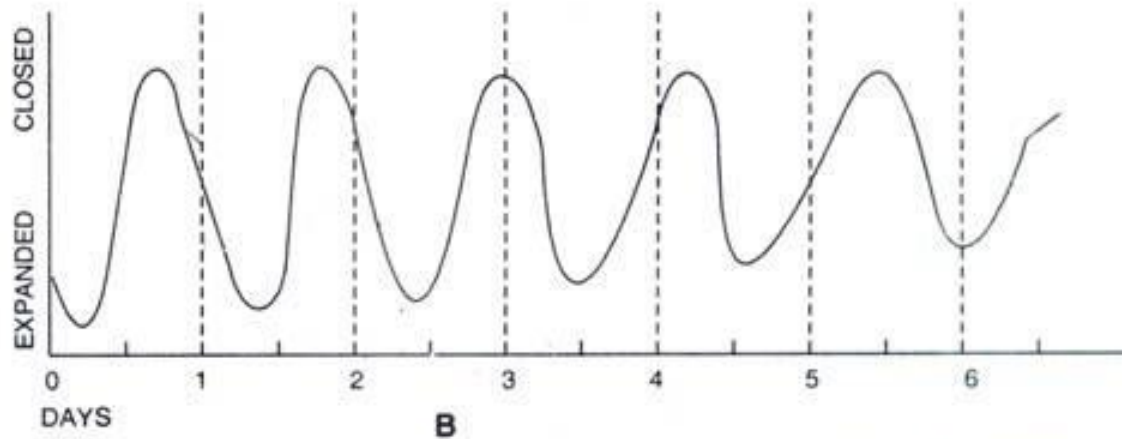
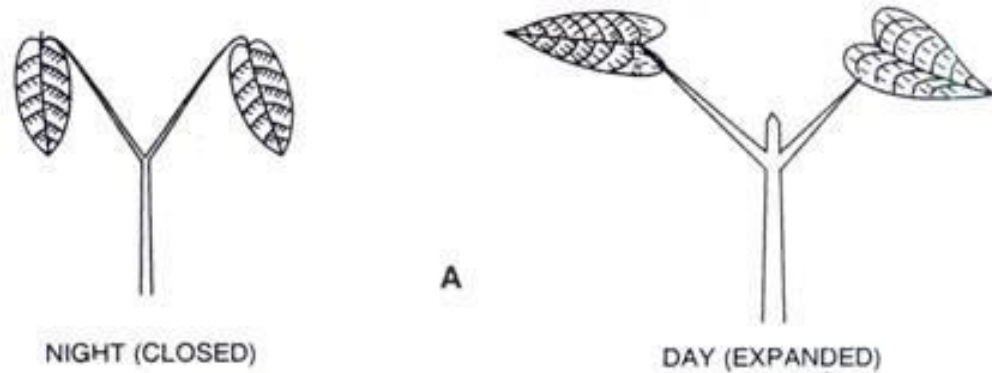


Fig. 22.1. Circadian plant rhythm. A. The positions of primary leaves of *Phaseolus multiflorus* during day and night. B. Graphic representation of leaf movements under uniform environmental conditions. The peaks refer to the closed leaves and troughs to the expanded leaves.

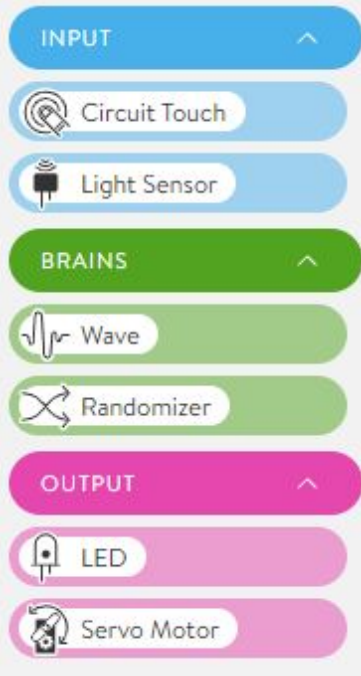
Strawbees CODE: Flow Programming

Paulo walked us through Flow Programming workspace, the different types of Nodes, and how they connect together. He focused on using the Brain - Wave Node to control the inputs such as the servo motor and LEDs. The simulator made it possible to think apply different shapes of waves for controlling the brightness and it's animation or the acceleration to deceleration in the servo's motion.

The screenshot displays the Strawbees CODE Flow Programming workspace. The interface includes a browser window at the top with the URL `d37prvzdut2g89.cloudfront.net/flow/`. Below the browser, the Strawbees CODE logo is visible, along with navigation options like FILE, TUTORIALS, and an Untitled Program. The workspace is divided into several sections:

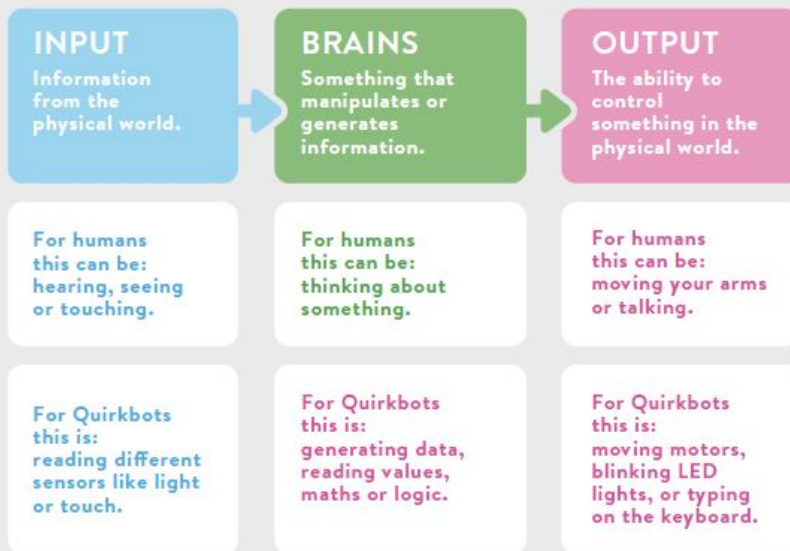
- Left Panel:** A sidebar with tabs for SIMPLE and ADVANCED. It lists various nodes under categories: INPUT (Circuit Touch, Light Sensor), BRAINS (Wave, Randomizer), and OUTPUT (LED, Servo Motor).
- Center Canvas:** A green 'Wave' node is connected to a pink 'LED' node. The Wave node has parameters: length (s) set to 3, type set to Sine, min set to 0, max set to 1, and offset set to 0. The LED node has a light intensity parameter and a 'place' button.
- Right Panel:** A 'SIMULATOR' section showing a 3D model of a robot and a waveform graph. The graph displays a sine wave with a time scale from 0.00 to 1.00.
- Bottom Bar:** A pink footer containing a 'Missing helper, click to install.' message, and links for Cookie Policy, Privacy Policy, and Terms of Use, along with the copyright notice © 2020 Strawbees AB.

Types of Nodes



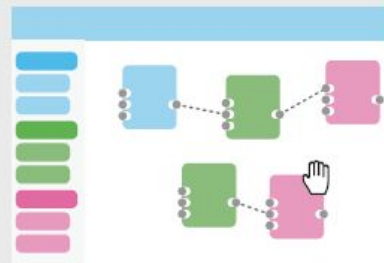
NODE CATEGORIES

There are three categories of nodes: **INPUT**, **BRAINS** or **OUTPUT**. They are represented on your screen by boxes of different colors.



PROGRAMMING WORKSPACE

All the available nodes are displayed in the menu on the left. Drag and drop a node from the menu onto the workspace to create your program. Nodes can be moved around, modified and connected as you like.



Node Parts

PARTS OF A NODE

The **color** represents a category



Node type

circuitTouch1

Unique name (can be edited)

place

LA

sensitivity

0

min

0

max

1

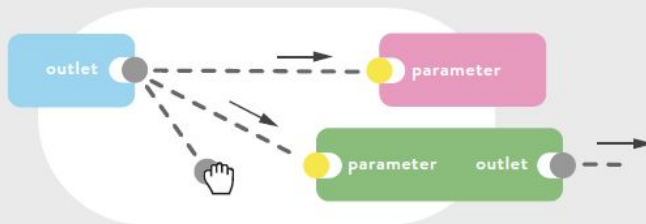
outlet

Parameters that change aspects of how the node works.

An outlet let you create connections and send information to another nodes.

CONNECTIONS

Connections let you **send data** from one node to another. You make a connection by dragging the outlet of a node and dropping it in the parameter of another node. Once connected, data flows **from** the outlet to the parameter.



Parameters

PARAMETERS

Parameters hold values that are important to the node. By changing the values you change how the node works. You decide if a parameter is fixed or connected to an outlet.



FIXED PARAMETER
(value doesn't change)



CONNECTED PARAMETER
(value changes when the connected outlet changes)

NUMBER PARAMETERS

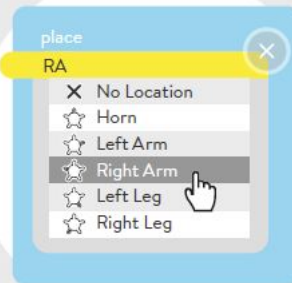
Many nodes have number parameters. You can set their value by using the slider or by typing directly into the box. Most numbers parameter go from 0 to 1, enabling you to connect them directly to most outlets.



OPTION PARAMETERS

Some nodes have option parameters. You can select their value by clicking on a item from the drop-down list or by writing the exact name of the option in the box.

Many input and output nodes have a place option parameter that represents where they exist in the physical world.



MIN & MAX PARAMETERS

Many nodes have minimum and maximum number parameters that control the smallest and largest values sent by the outlet.



Pair Programming with the Friendbot

Lindsay and Paulo teamed up to program the Friendbot using the Wave node to mimic a heart beating using Ramp Down. Then using the circuit touch to trigger the head of the Friendbot to show excitement. Otherwise the friendbot is calm in motion by default when nothing is touched.

The screenshot shows the Strawbees Code editor interface. At the top, there are navigation tabs for 'SIMPLE' and 'ADVANCED', and a sidebar with categories: 'INPUT' (Circuit Touch, Light Sensor), 'BRAINS' (Wave, Randomizer), and 'OUTPUT' (LED, Servo Motor). The main workspace contains two flow programs. The top program starts with a 'Wave' node (wave1) with 'length (s)' set to 1 and 'type' set to 'Ramp Down'. Its 'outlet' connects to two 'LED' nodes (led1 and led2), each with 'light intensity' and 'place' (Left arm and Right arm) set. The bottom program starts with a 'Circuit Touch' node (circuitTouch1) with 'place' set to 'Horn' and 'sensitivity' set to 0. Its 'outlet' connects to a 'Wave' node (wave2) with 'type' set to 'Sine', 'min' set to 0.4, and 'max' set to 0.8. This 'outlet' then connects to a 'Servo Motor' node (servoMotor1) with 'position' set to 1 and 'place' set to 'Servo 1'. On the right, there is a 'SIMULATOR' window showing a 3D model of the Friendbot with a smartphone connected to its head. Below the simulator are three data visualization graphs: a blank graph, a green square wave graph, and a green sine wave graph. A small video thumbnail of Lindsay Balfour is visible in the top right corner.

Flow Program:
<https://code.strawbees.com/flow/?p=5fd21ae7ba7138d1348e55b8>