Materials and Component Information

Your mirobot is contains many different hardware and electronic components sourced from all over the world, and assembled here in Cambodia.

Body

The body of the mirobot is composed of a *main chassis, spine, tail, penholder, servoholder, and wheels*. Each of these components is *3d-printed* from a plastic called PLA (Poly Lactic Acid). PLA is a plastic made entirely from renewable sources such as corn-starch, cassava-root or sugarcane, and is *biodegradable* by composting.

Design files for the 3d-printed components are available at github.com/stemphnompenh/MB2CCE/stls

To make the 3d-printed components for your mirobot takes around 22 hours with a Prusa i3 Mk2 3d-printer prusa3d.com/ .

Different parts of the body are held together with stainless steel nuts and bolts, bearings, and heat-insert threads.

Brain

Your mirobot is controlled by the blue electronic circuit board on the front. This board holds electronic components including a *microprocessor, WiFi chip, motor driver, and sensors.* The board is designed and assembled here in Cambodia, using components from around Asia, including Cambodia, Thailand, Vietnam and China.

Design files for the electronic components are available github.com/stemphnompenh/MB2CCE/electronic .

The main brain of the robot is an Arduino Pro Mini board arduino.cc/en/Main/ArduinoBoardProMini , which accesses information from the WiFi chip, signals from the sensors, and sends commands to the motor driver chip.

The WiFi controller is an ESP8266 12F board espressif.com/en/products/hardware/esp8266ex/overview which communicates on your WiFi network, and also hosts the built-in website for basic controls.

The motor driver and sensors allow your mirobot to sense its environment, drive around, and manipulate the pen or pencil, according to your instructions.

Box

Your mirobot is kept safe in a polypropylene box, with padding and conformal sheet made from polystyrene.

The shaped plastic conformal sheet in the box is made by a process called *vacuum-thermoforming*, where a flat plastic sheet is heated, and pulled down over a mold shape by a strong vacuum. Once it cools it retains its shape, acting to securely hold your mirobot in place for transport.

The expanded polystyrene padding is shaped using a *laser-cut* stencil and a *hot-wire cutter*.

The details of the thermoformer are available at github.com/STEMPhnomPenh/Vacuum-thermoforming