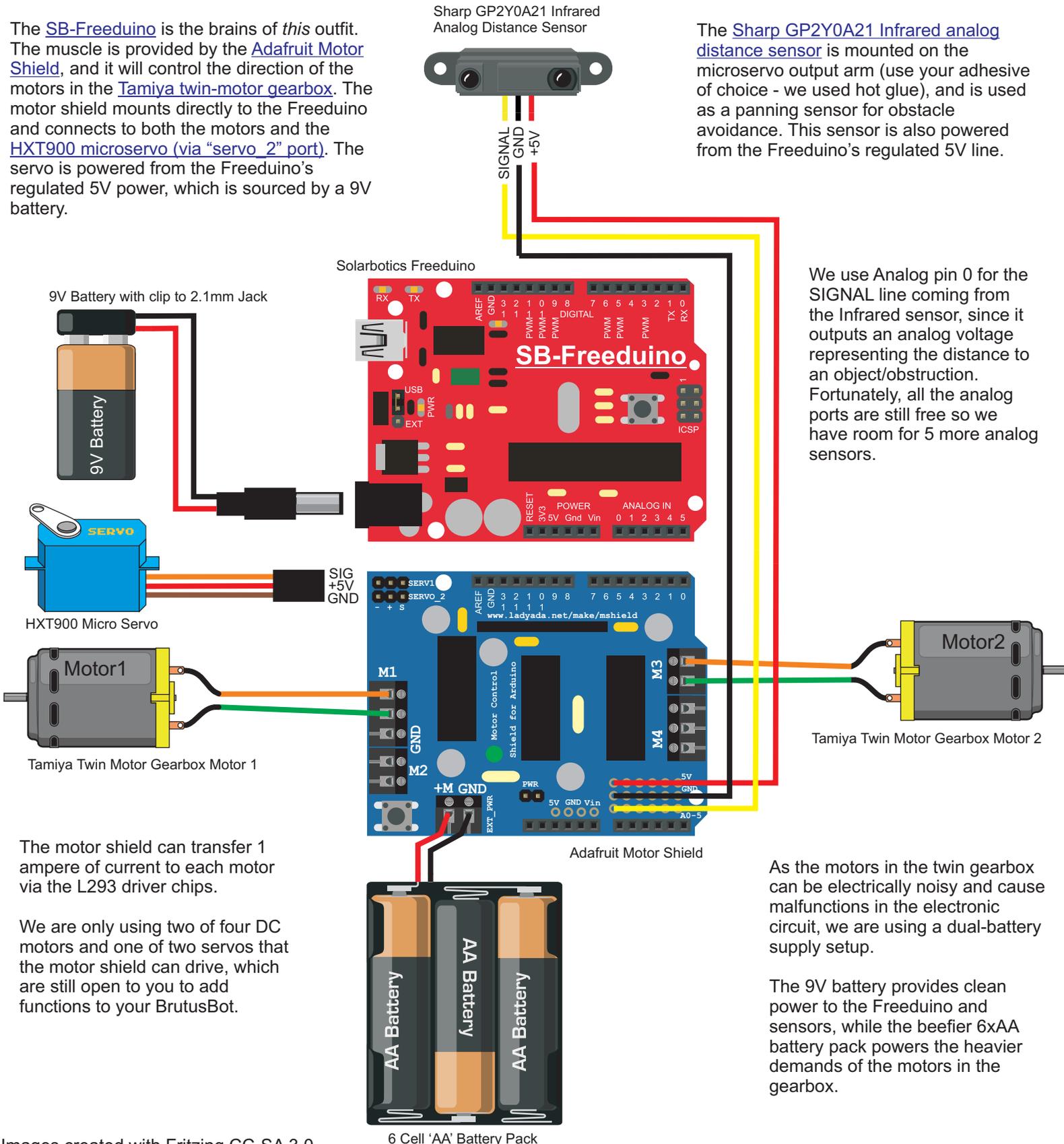


# PRINCIPLE OF DESIGN

Our example BrutusBot was designed using the following components and wired as shown:

The [SB-Freeduino](#) is the brains of *this* outfit. The muscle is provided by the [Adafruit Motor Shield](#), and it will control the direction of the motors in the [Tamiya twin-motor gearbox](#). The motor shield mounts directly to the Freeduino and connects to both the motors and the [HXT900 microservo](#) (via "servo\_2" port). The servo is powered from the Freeduino's regulated 5V power, which is sourced by a 9V battery.

The [Sharp GP2Y0A21 Infrared analog distance sensor](#) is mounted on the microservo output arm (use your adhesive of choice - we used hot glue), and is used as a panning sensor for obstacle avoidance. This sensor is also powered from the Freeduino's regulated 5V line.



We use Analog pin 0 for the SIGNAL line coming from the Infrared sensor, since it outputs an analog voltage representing the distance to an object/obstruction. Fortunately, all the analog ports are still free so we have room for 5 more analog sensors.

The motor shield can transfer 1 ampere of current to each motor via the L293 driver chips.

We are only using two of four DC motors and one of two servos that the motor shield can drive, which are still open to you to add functions to your BrutusBot.

As the motors in the twin gearbox can be electrically noisy and cause malfunctions in the electronic circuit, we are using a dual-battery supply setup.

The 9V battery provides clean power to the Freeduino and sensors, while the beefier 6xAA battery pack powers the heavier demands of the motors in the gearbox.

6 Cell 'AA' Battery Pack