Product Description
R2-D2 Movable Torch Prototype

Description

This is a movable torch with a design based on the R2-D2 droid (or R2 for short) from the Star Wars saga (© Lucasfilm).

R2 uses a Particle Argon IoT development board as the CPU to relay information between internet-based applications through IFTTT.com and physical devices like servo motors and LEDs.

There is a torch in R2's hemispherical head that can be turned on and off by toggling a touch-sensitive button on R2's head.

R2 is able move and turn using servo wheels in two of his three legs at the sides. The third leg in the middle has a roller ball for easy maneuverability and balance. The user can control the directions using commands on Google Sheets.

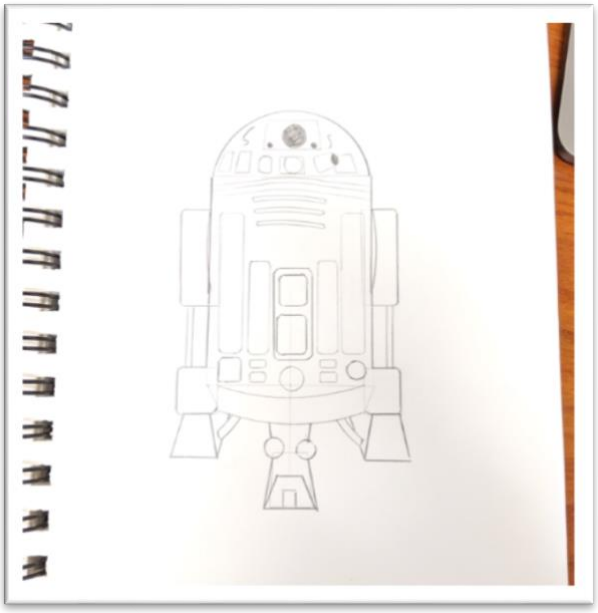
When operated through Google Sheets, the device also sends a customized e-mail to the user.

Inspiration

This design is inspired from the R2-D2 droid featured in the Star Wars saga.

Source: Star Wars: A New Hope (1977)

Concept Art



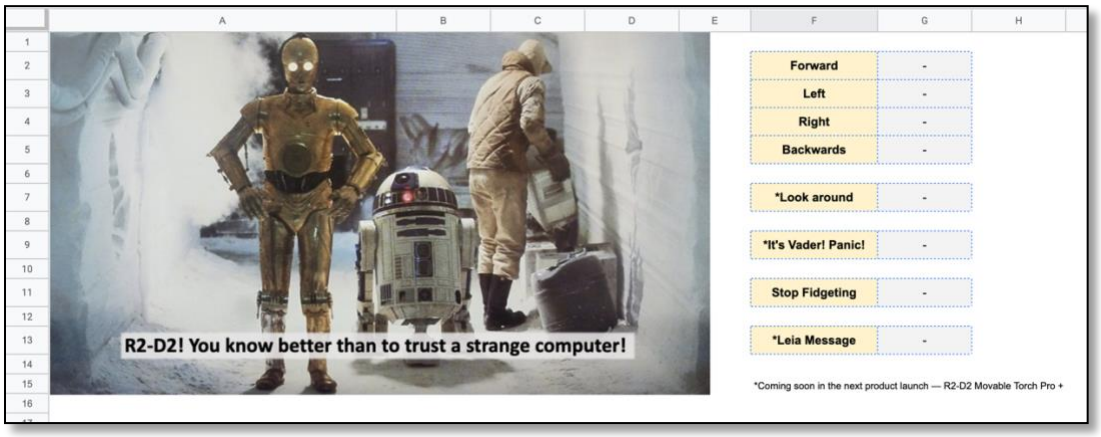
Initial Concept Design

Interaction with IFTTT

The Brain

The Particle Argon is the CPU of the digital pet and has the following functions:

a. The Argon receives commands from a Google Sheet (link) through the IFTTT interface and relays the commands to the servo motors.

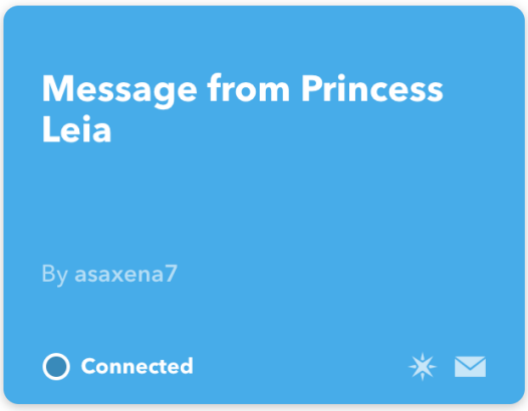


Custom Google Sheet (User: asaxena7@sas.upenn.edu)

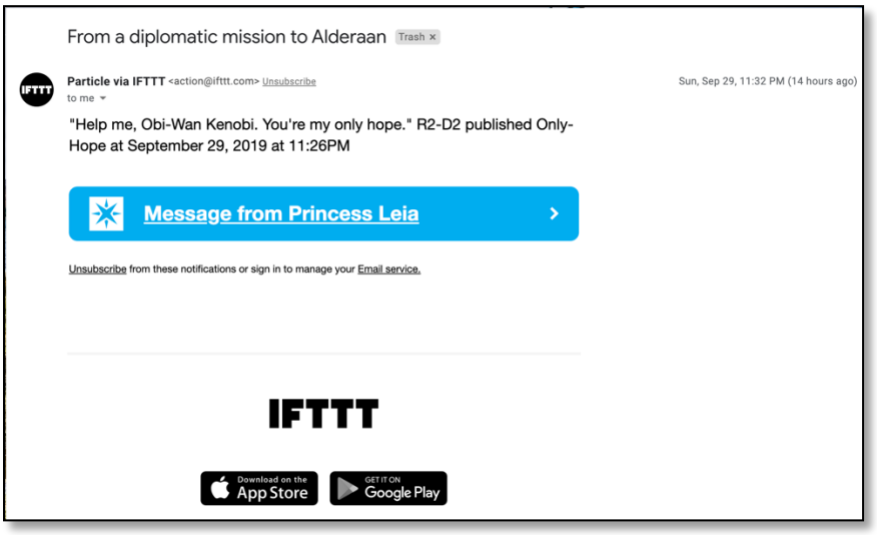
Custom applications on IFTTT.com (User: asaxena7)

b. The Argon also relays a signal from the touch capacitor to either turn on or off an LED torch.
c. When the servos are updated in any direction, the Argon sends a signal back to IFTTT that sends an e-mail to the user.
    i. E-mail Subject: “From a diplomatic mission to Alderaan”

ii. E-mail Body: “Help me, Obi-Wan Kenobi. You're my only hope. [DeviceName] published [EventContents] at [CreatedAt]”



Custom application on IFTTT.com (User: asaxena7)



Custom e-mail sent by the device (User: asaxena7@sas.upenn.edu)

Light Control

The touch inputs 1 and 2 in the capacitive touch IC are used to turn on and off respectively the LED light. The Argon relays the commands from the IC (with its IRQ pin connected to the Argon’s D6 input terminal) to the LED (which is attached to the D3 output terminal of the Argon).

Locomotion

There are two servo motors are attached to the Argon's output terminals D5 and D7. The Wi-Fi connected Argon receives a signal from the user's Google Sheet (link) by monitoring value changes in the cells G2, G3, G4, G5, and G11 and accordingly sends the output signal to the two servo motors simultaneously.

Sending Data through IFTTT

The IFTTT interface monitors a Google Sheet (link) to check if the value of any of the cells G2, G3, G4, G5, and G11 are modified. If yes, the IFTTT sends the command to the Argon using the following logic:

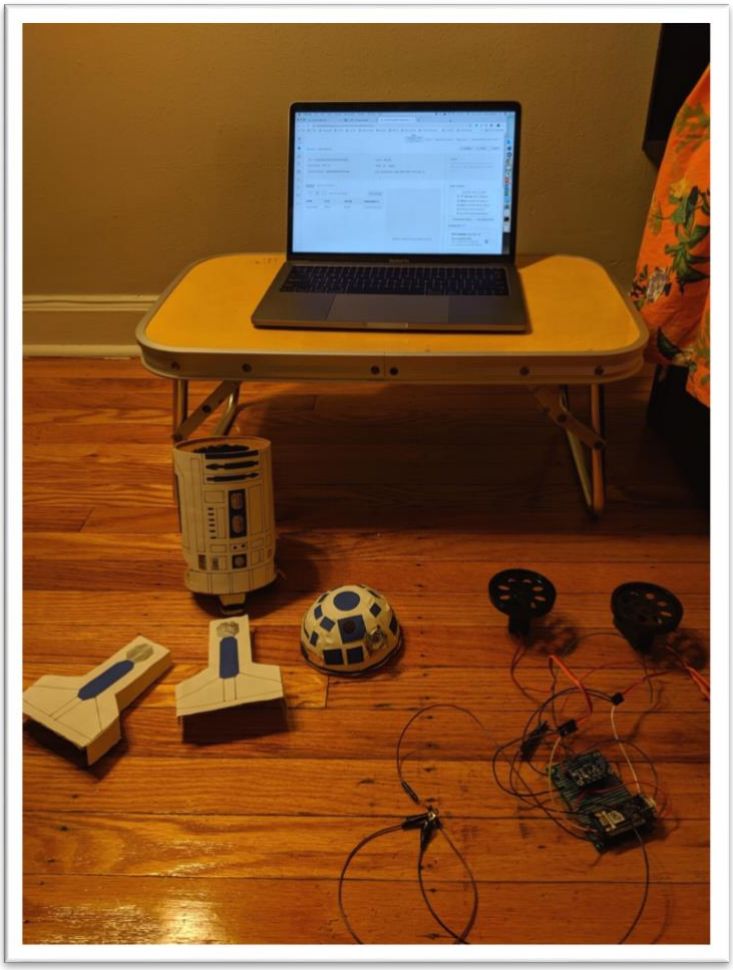
a. Change in G2 moves the two motors clockwise
b. Change in G3 moves the first motor clockwise and the second counter-clockwise
c. Change in G4 moves the first motor counter-clockwise and the second clockwise
d. Change in G5 moves both motors counter-clockwise
e. Change in G11 stops all motors

Receiving Data through IFTTT

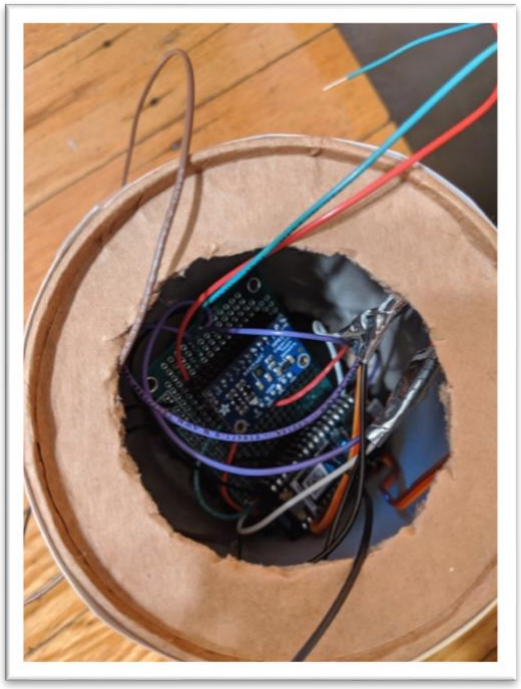
Whenever a servo changes direction or stops, a public event called "R2-D2-Leia-Message" with data "Only-Hope" is published to the Particle Device Cloud that triggers an IFTTT response of sending an e-mail to the registered user (asaxena7@sas.upenn.edu). The e-mail contents have been described in section 1(c) above.

Product Gallery

Product body parts made with cardboard



Juxtaposing the hardware and software

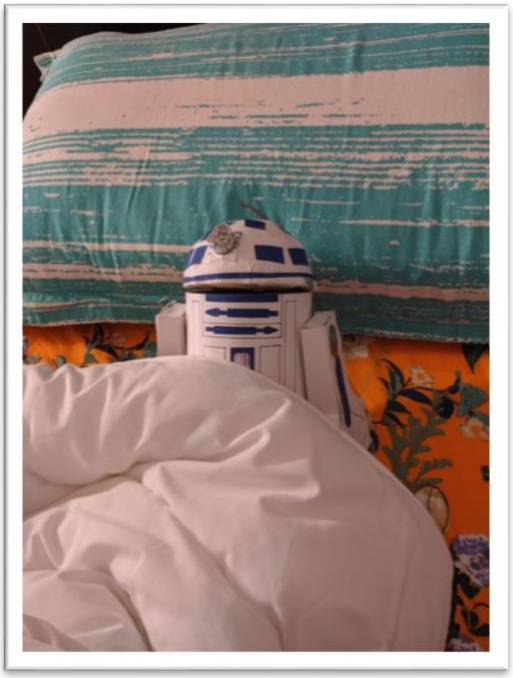


The anatomy of the product

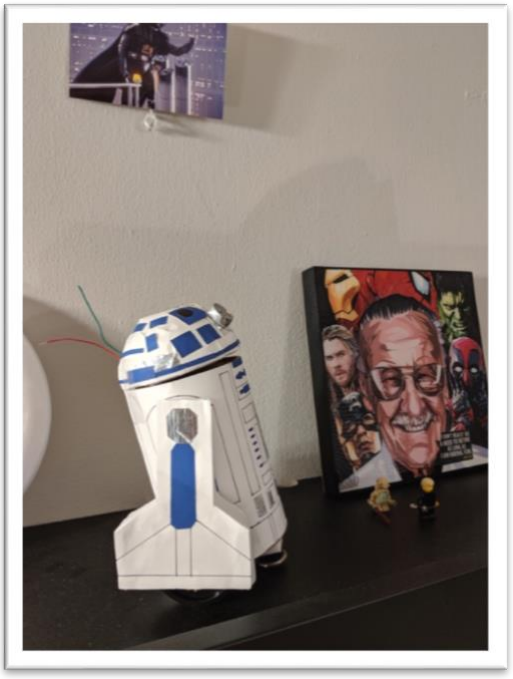
Final R2 product with his entourage

R2-D2 squared

The MVP of Star Wars



After starring in ten movies, at least two TV shows, and numerous comics



Hall of fame