

Back to Leidenschaft

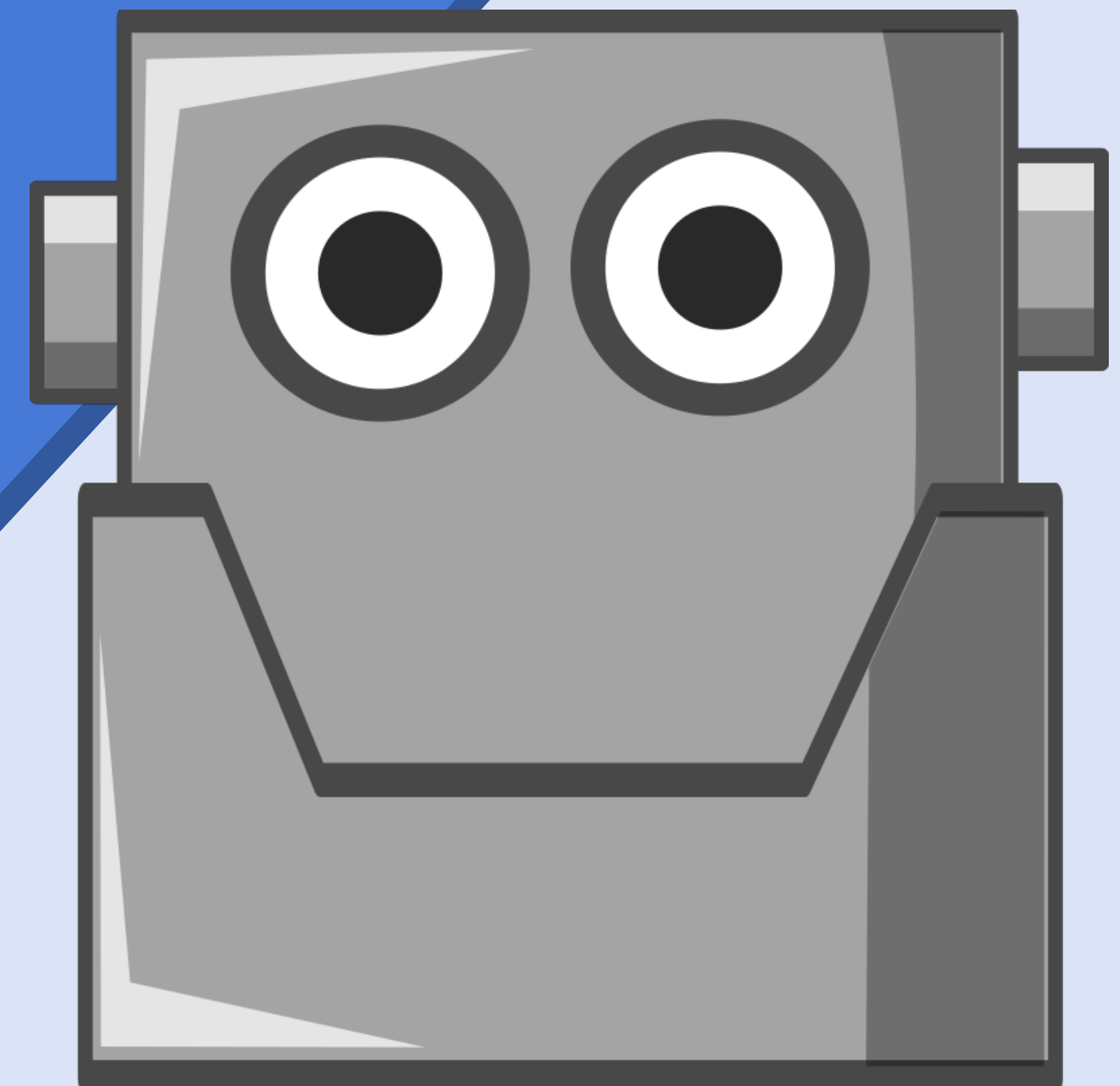


DYI voice-controlled car built with Android Things, Google Actions and Firebase



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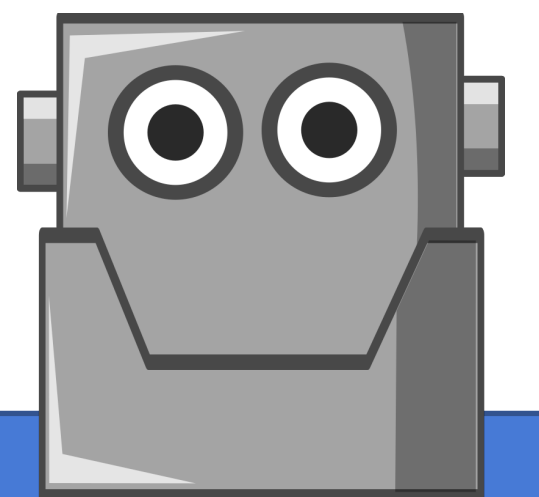
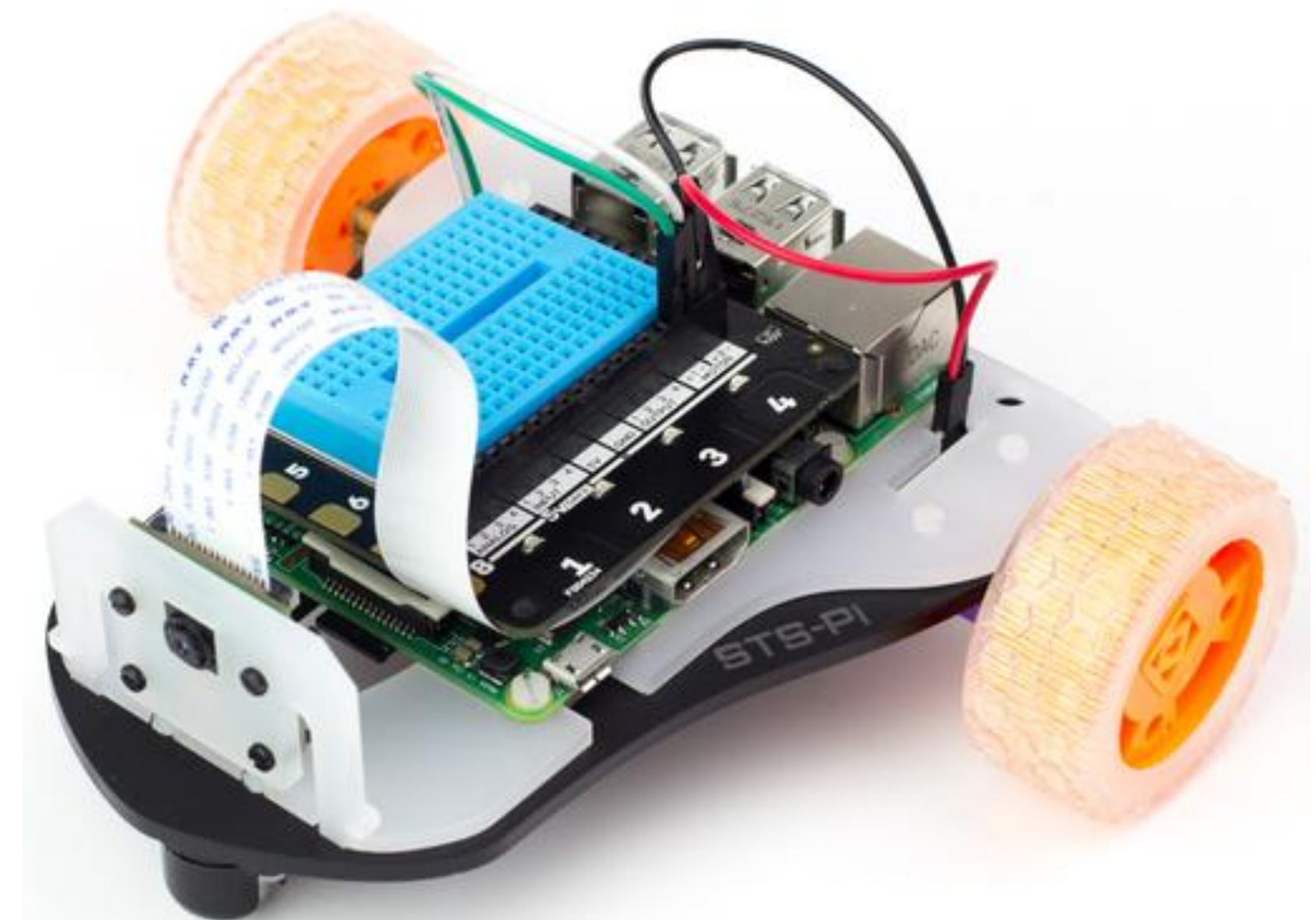
ToBoT, DIY voice controlled car

Hardware

- ... DIY Google Assistant Cardboard
- ... DIY Raspberry Pi + Explorer HAT vehicle (STS-Pi)
- ... Raspberry Pi + Rainbow HAT

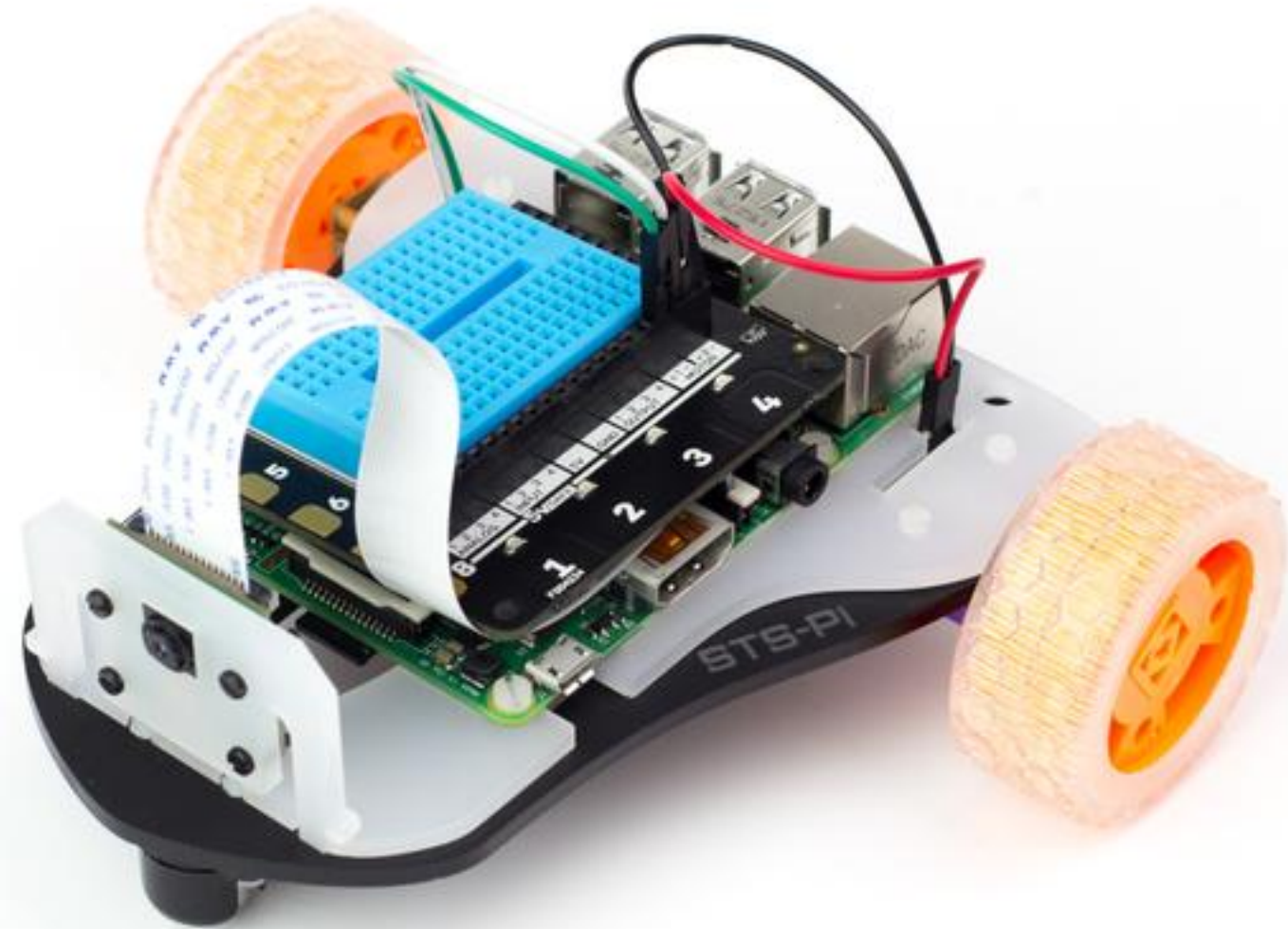
Software

- ... Android Things with Java
- ... Firebase with node.js

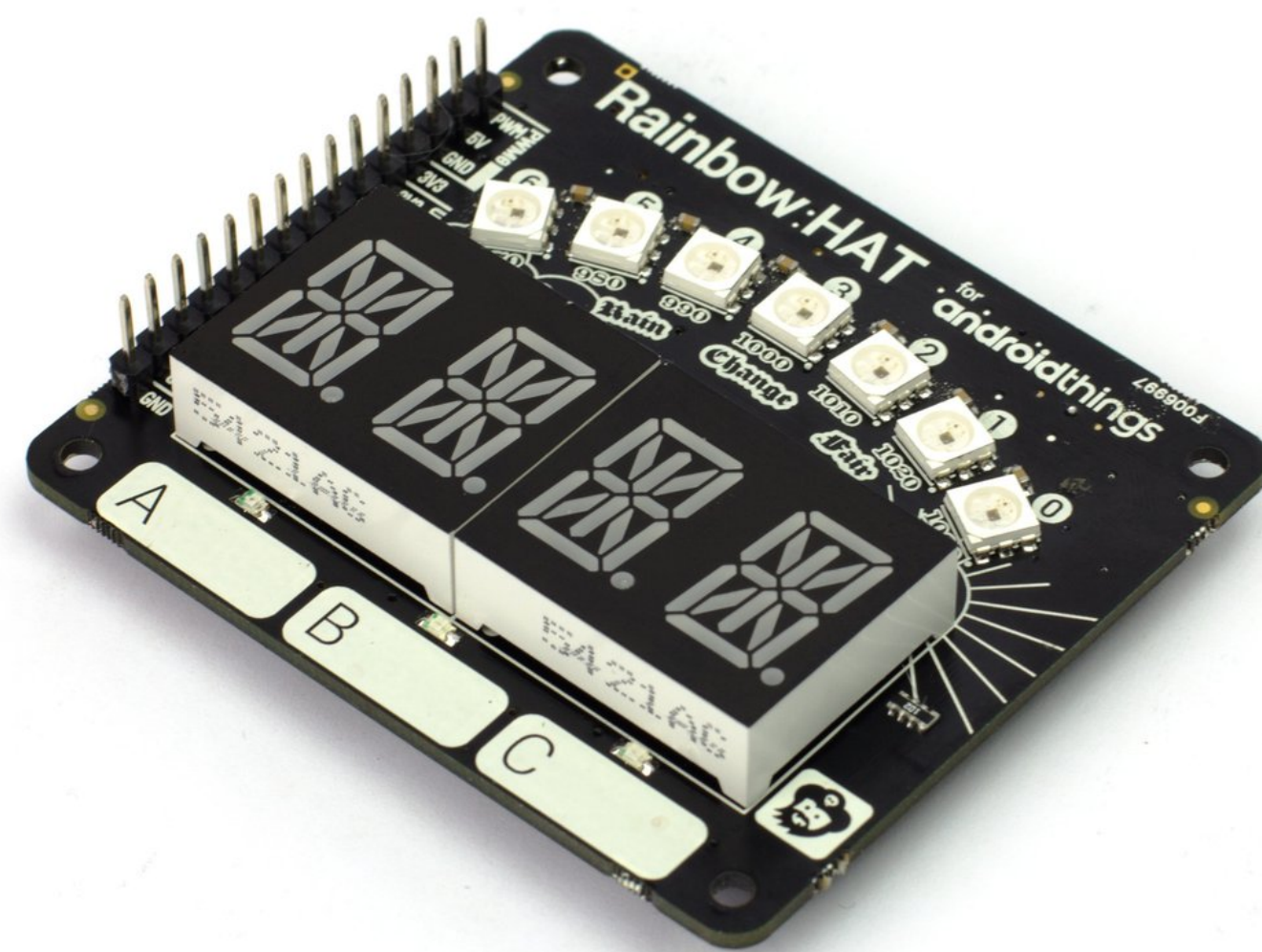


Hardware

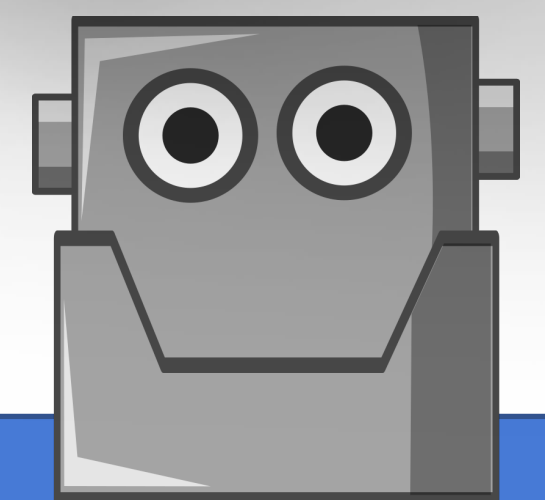
Google AIY Voice Kit
Incl. 3rd Raspberry Pi



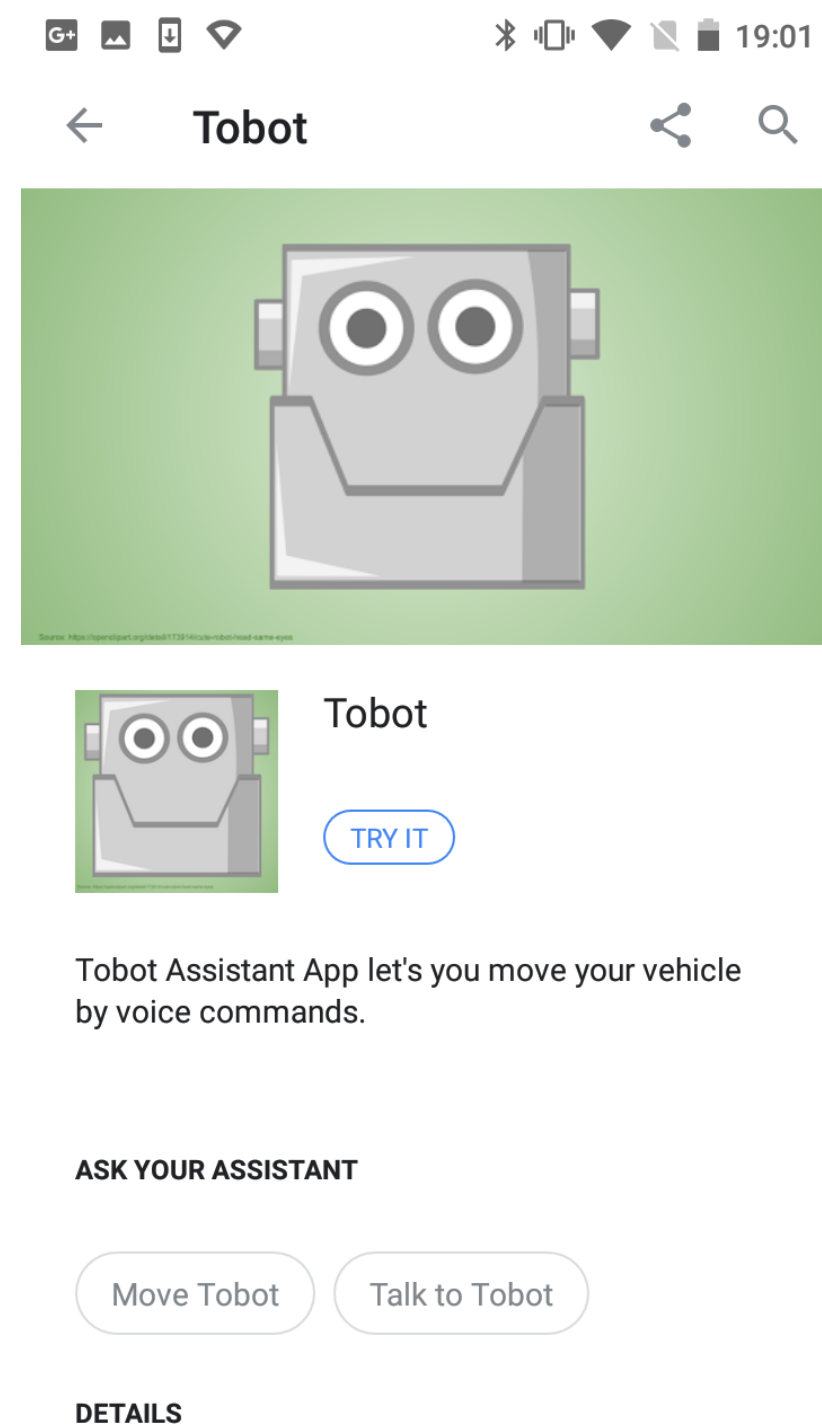
Pimoroni STS-Pi
Incl. Explorer HAT



Pimoroni Rainbow HAT
Incl. 2nd Raspberry Pi



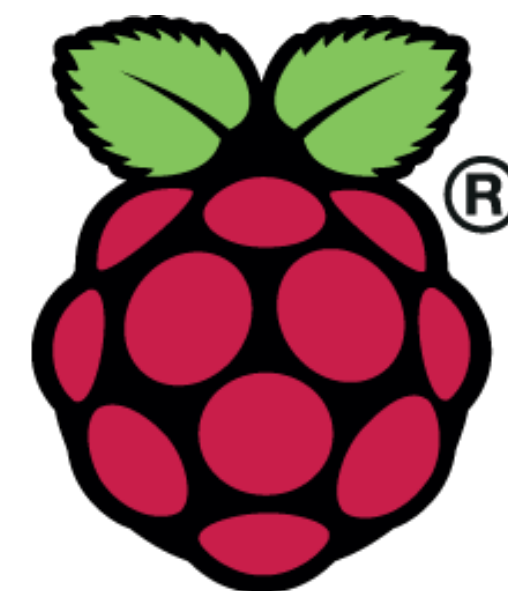
Software



Google Actions

android
things

Android Things

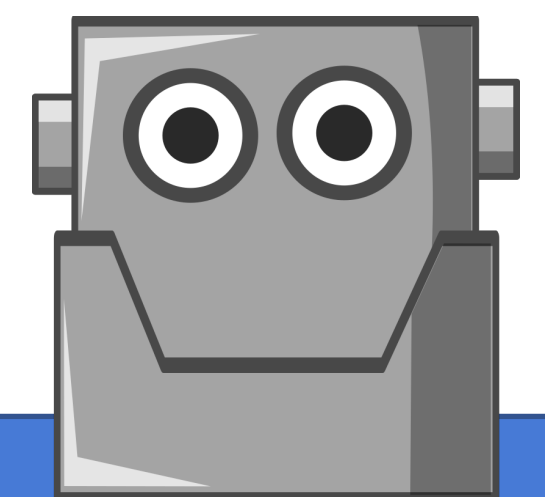


Raspbian

Firebase



Firebase



What's Android Things?

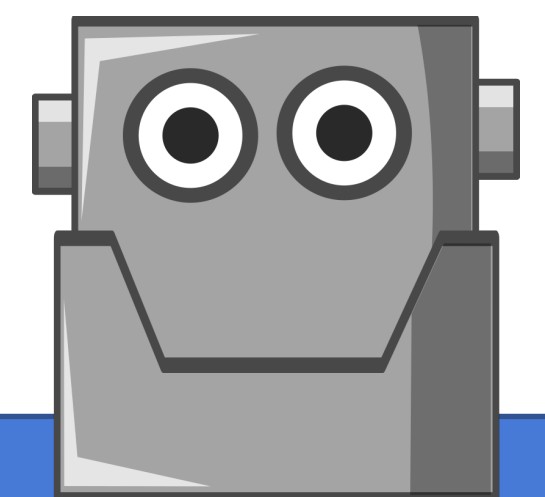
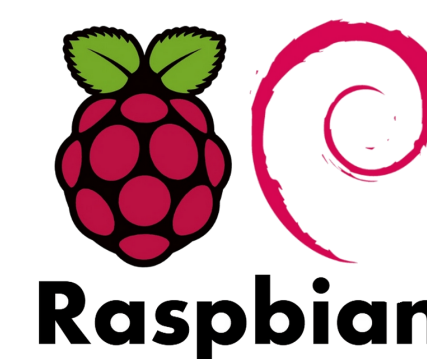
„Android Things lets you build smart, connected devices for a wide variety of consumer, retail, and industrial applications“

In short

- Reduced Android (8.1) for embedded / single purpose devices
- Development is equal to Android on mobile devices
- Access to Google Play Services etc.
- Currently used in e.g. OEM Smart Speakers
- Extended fleet management support via Things Console

Alternatives for Raspberry Pi

- Microsoft Windows 10 IoT Core
- Raspbian (in a way of)
- Minimal Docker OS / openFaaS



„Reverse Engineered Library“

What's available

- Board's technical documentation
- Open Source Python Library
- GPIO Mappings

What I need / built

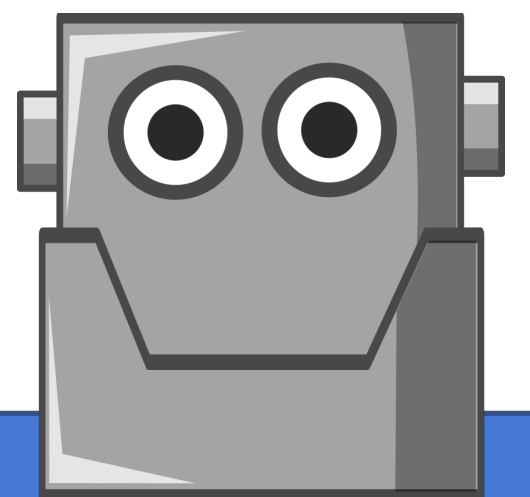
- Java Manager implementation to let the vehicle move, blink and beep

```
public class MovementManager
{
    private final String TAG = MovementManager.class.getSimpleName();

    @SuppressWarnings("FieldCanBeLocal")
    private final String LEFT_MOTOR_FWD_GPIO_NAME = "BCM19";
    @SuppressWarnings("FieldCanBeLocal")
    private final String LEFT_MOTOR_BWD_GPIO_NAME = "BCM20";
    @SuppressWarnings("FieldCanBeLocal")
    private final String RIGHT_MOTOR_FWD_GPIO_NAME = "BCM21";
    @SuppressWarnings("FieldCanBeLocal")
    private final String RIGHT_MOTOR_BWD_GPIO_NAME = "BCM26";

    private Gpio rightMotorFwd;
    private Gpio rightMotorBwd;
    private Gpio leftMotorFwd;
    private Gpio leftMotorBwd;

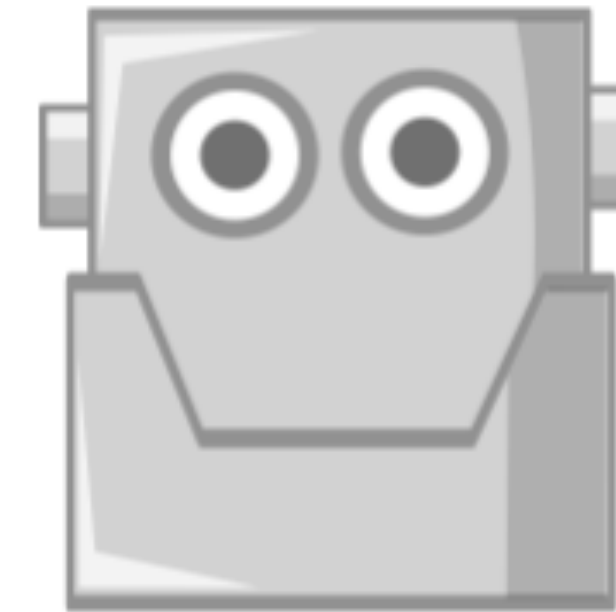
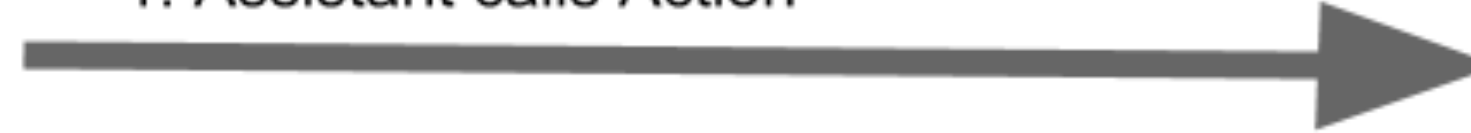
    /**
     * Instantiates and configures all movement related parts like motors.
     */
    public MovementManager()
    {
        // Map Pins to motors
        PeripheralManager peripheralManager = PeripheralManager.getInstance();
        try
        {
```



Flow

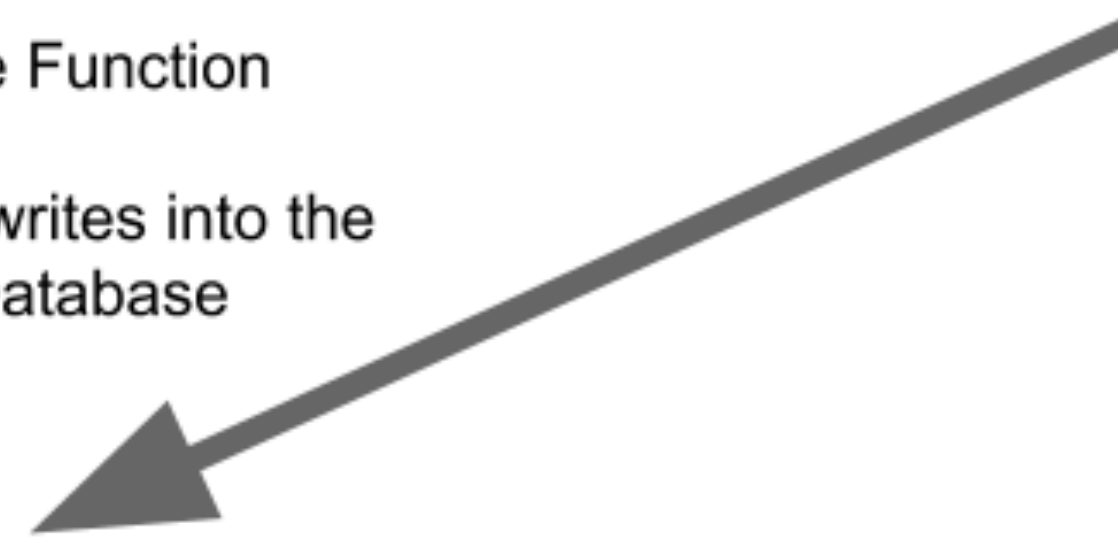


1. Assistant calls Action



2. Action calls Firebase Function

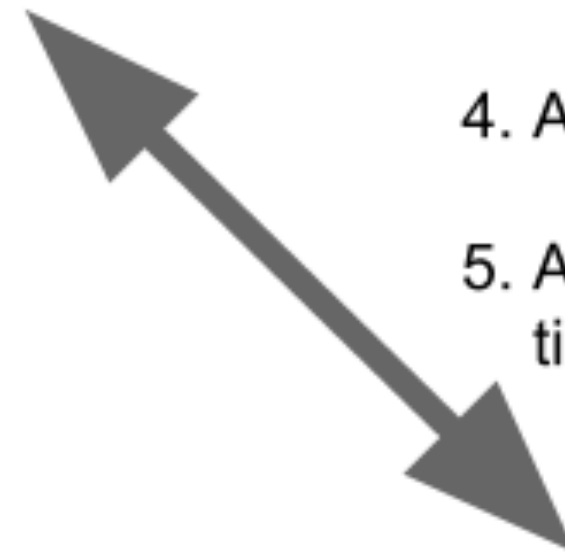
3. Firebase Functions writes into the
Firebase Realtime Database



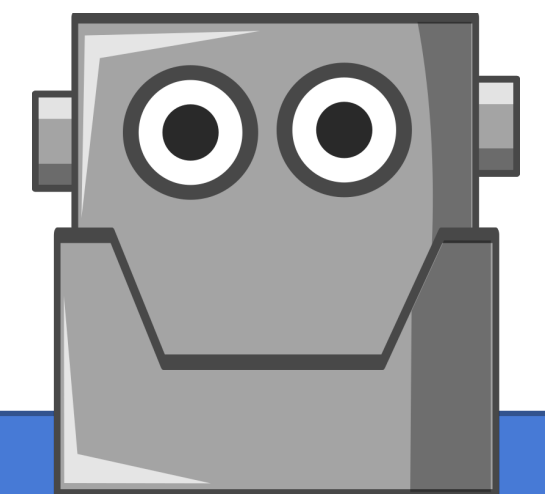
Firebase

4. Android Things listens on database changes

5. Android Things acknowledges executed movement commands with
timestamp

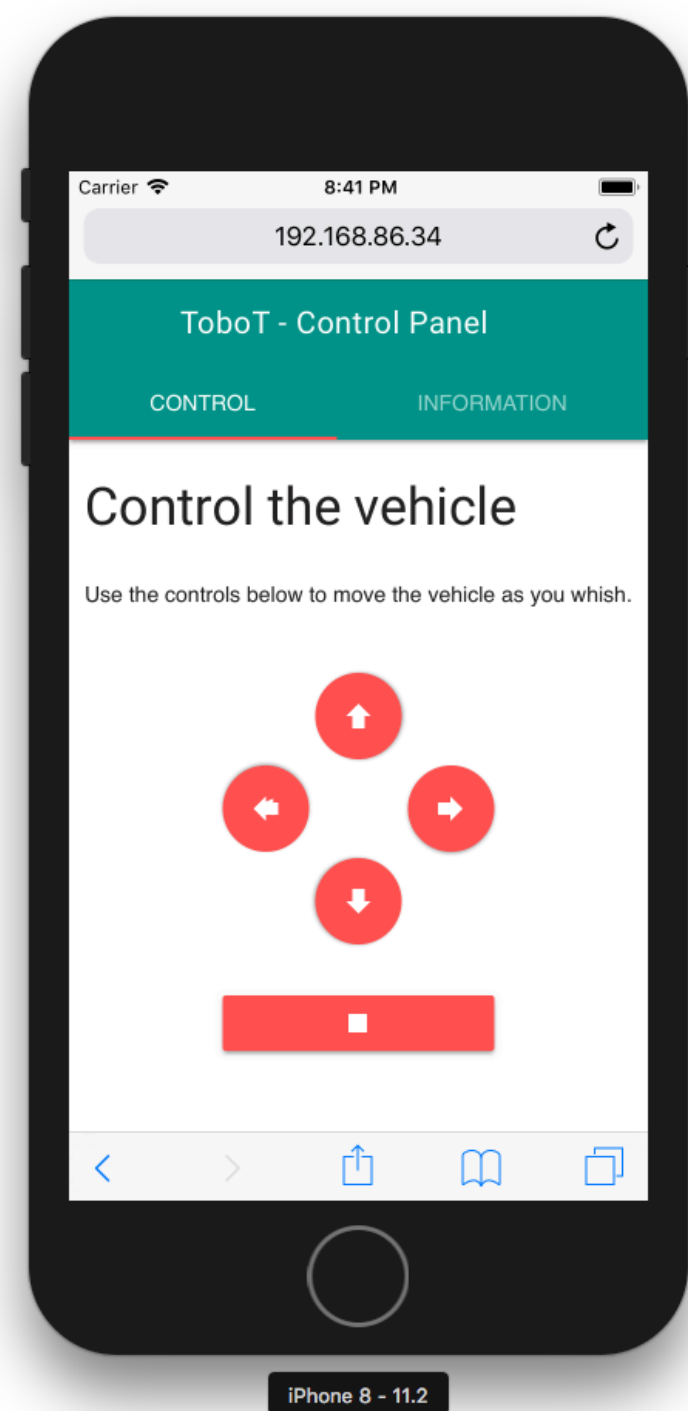


androidthings

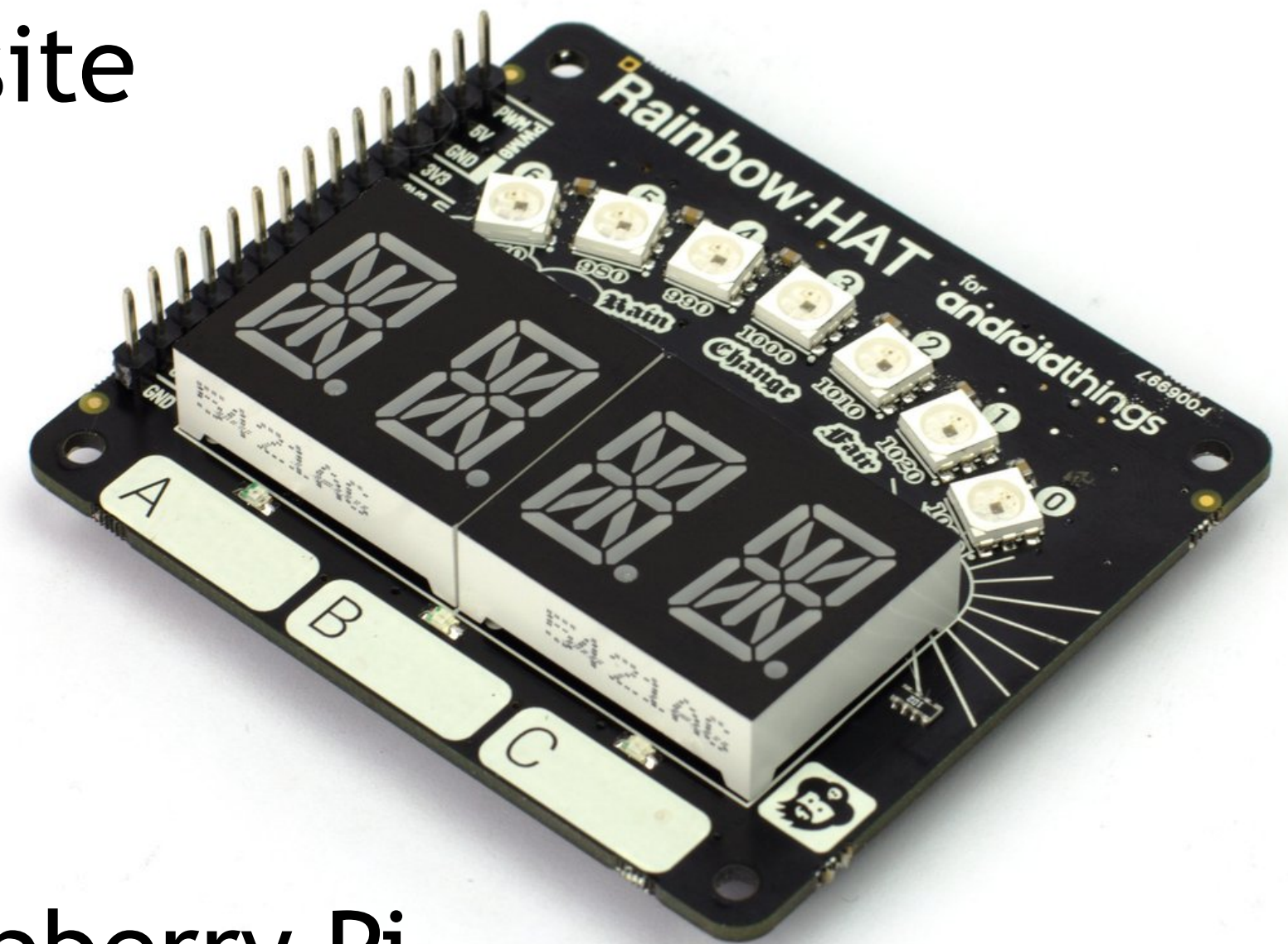


On-vehicle website
Replaces step 1 to 3.

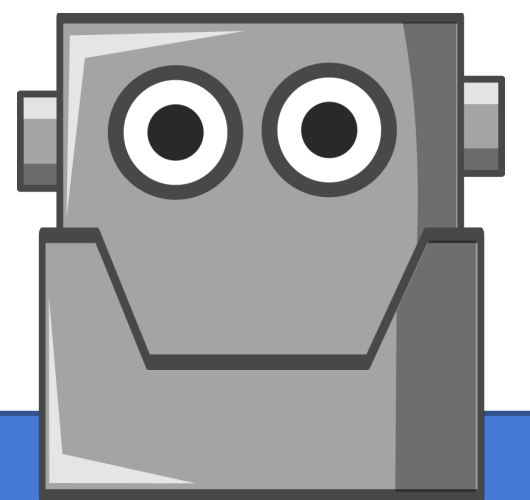
Other ways to control ToBoT



On-device (in-app) hosted website

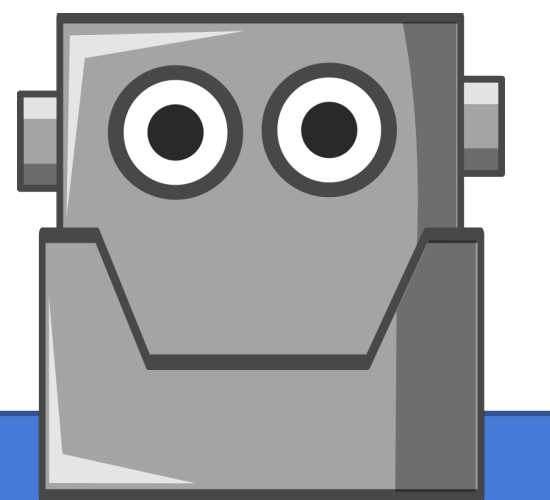


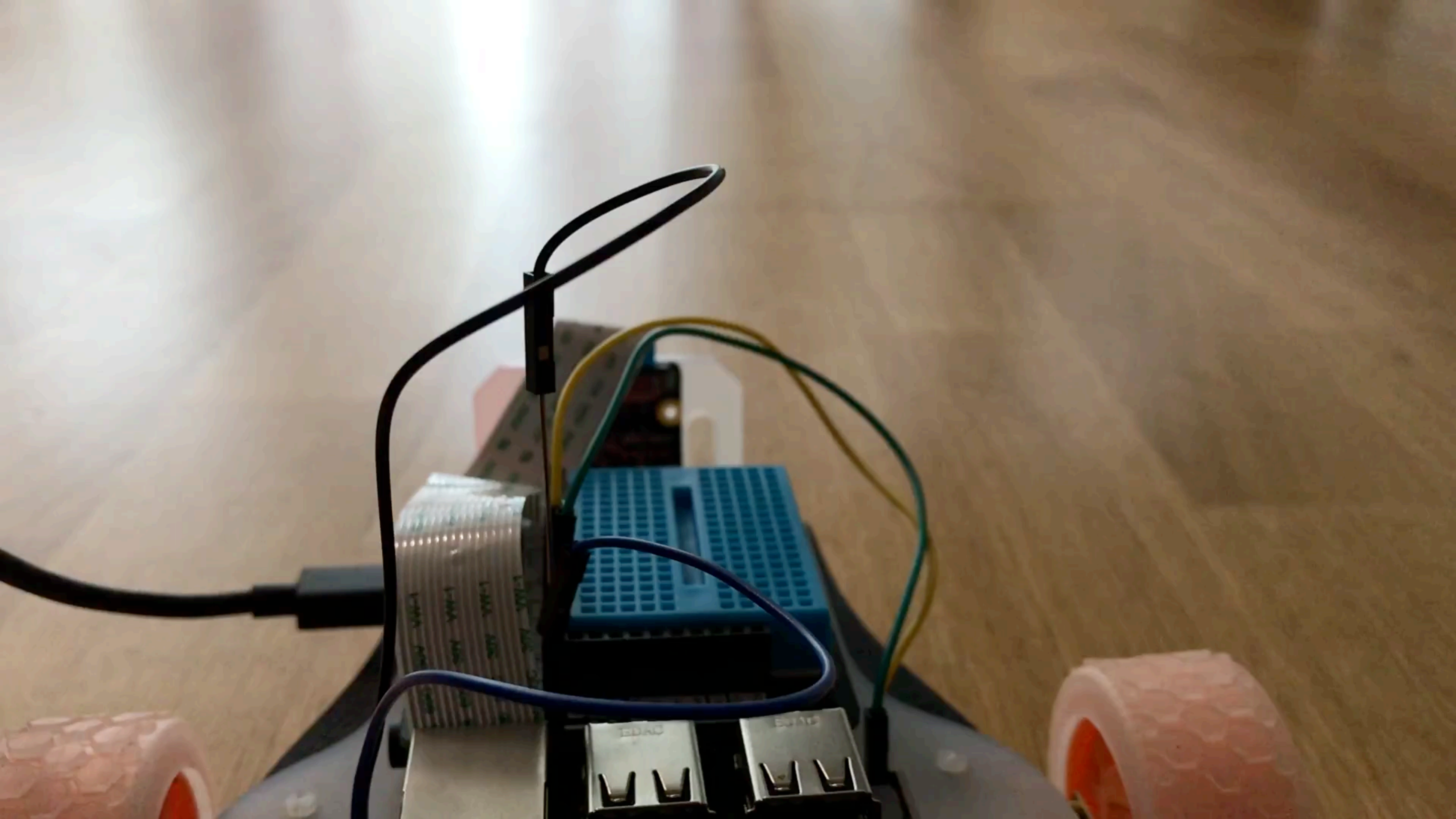
Rainbow HAT + Raspberry Pi
remote control



Result

IT WORKS! 🎉

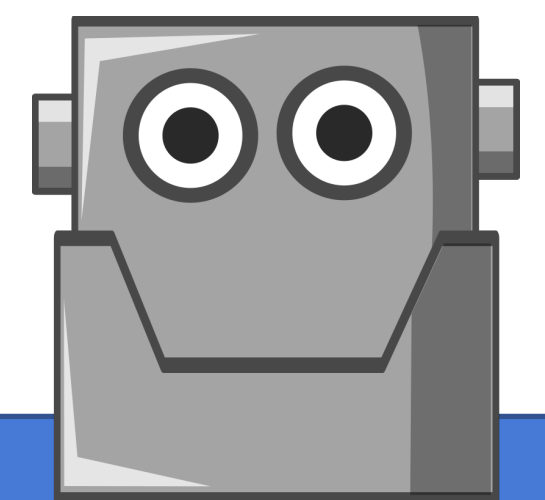
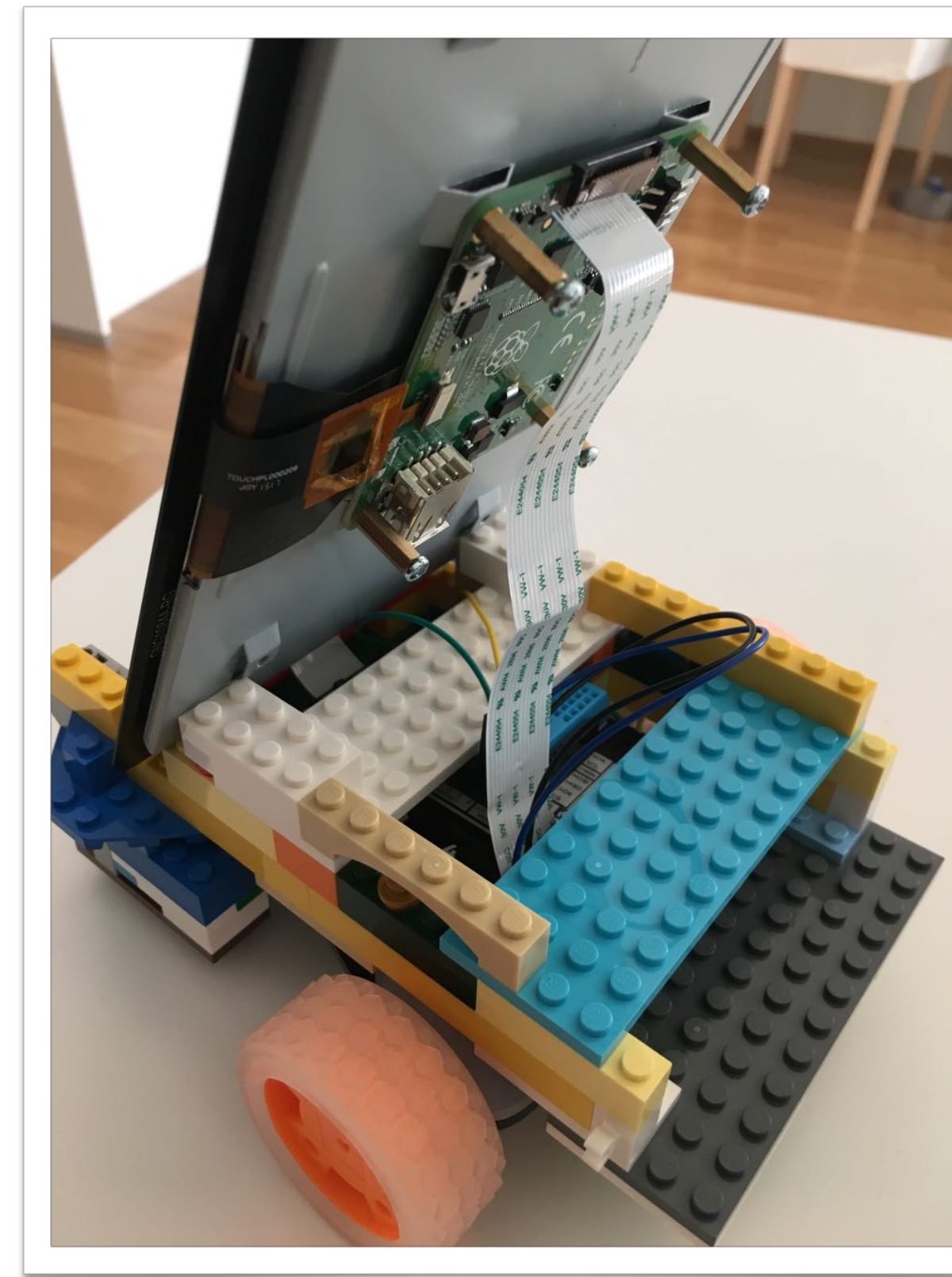




Okay, not everything went well

Lessons learned:

1. LEGO is too heavy if you want to build an enclosure
2. Implement always the `stop`-feature first!



Aaaand, it's (properly) gone.

- No support for the latest Pi
- No more commercial support
- No follow-up community for Google +
- Sad

Android Developers Blog

The latest Android and Google Play news for app and game developers.

An Update on Android Things

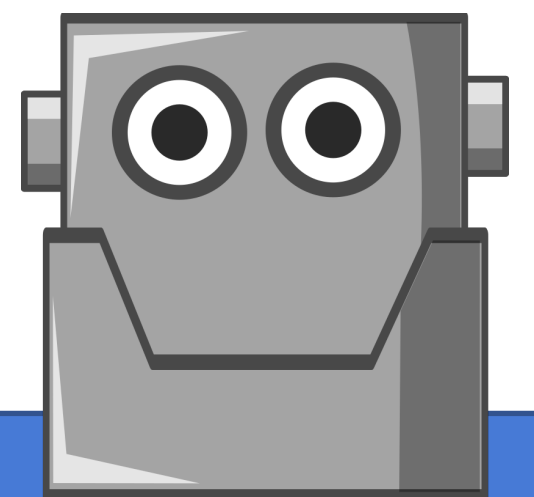
12 February 2019

Posted by [Dave Smith](#), Developer Advocate for IoT

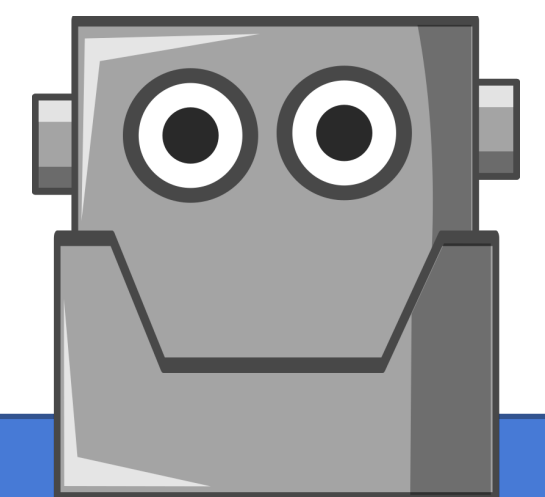
Over the past year, Google has worked closely with partners to create consumer products powered by Android Things with the Google Assistant built-in. Given the successes we have seen with our partners in smart speakers and smart displays, we are refocusing Android Things as a platform for OEM partners to build devices in those categories moving forward. Therefore, support for production System on Modules (SoMs) based on NXP, Qualcomm, and MediaTek hardware will not be made available through the public developer platform at this time.

Android Things continues to be a platform for experimenting with and building smart, connected devices using the [Android Things SDK](#) on top of popular hardware like the NXP i.MX7D and Raspberry Pi 3B. System images for these boards will remain available through the [Android Things console](#) where developers can create new builds and push app updates for up to 100 devices for non-commercial use.

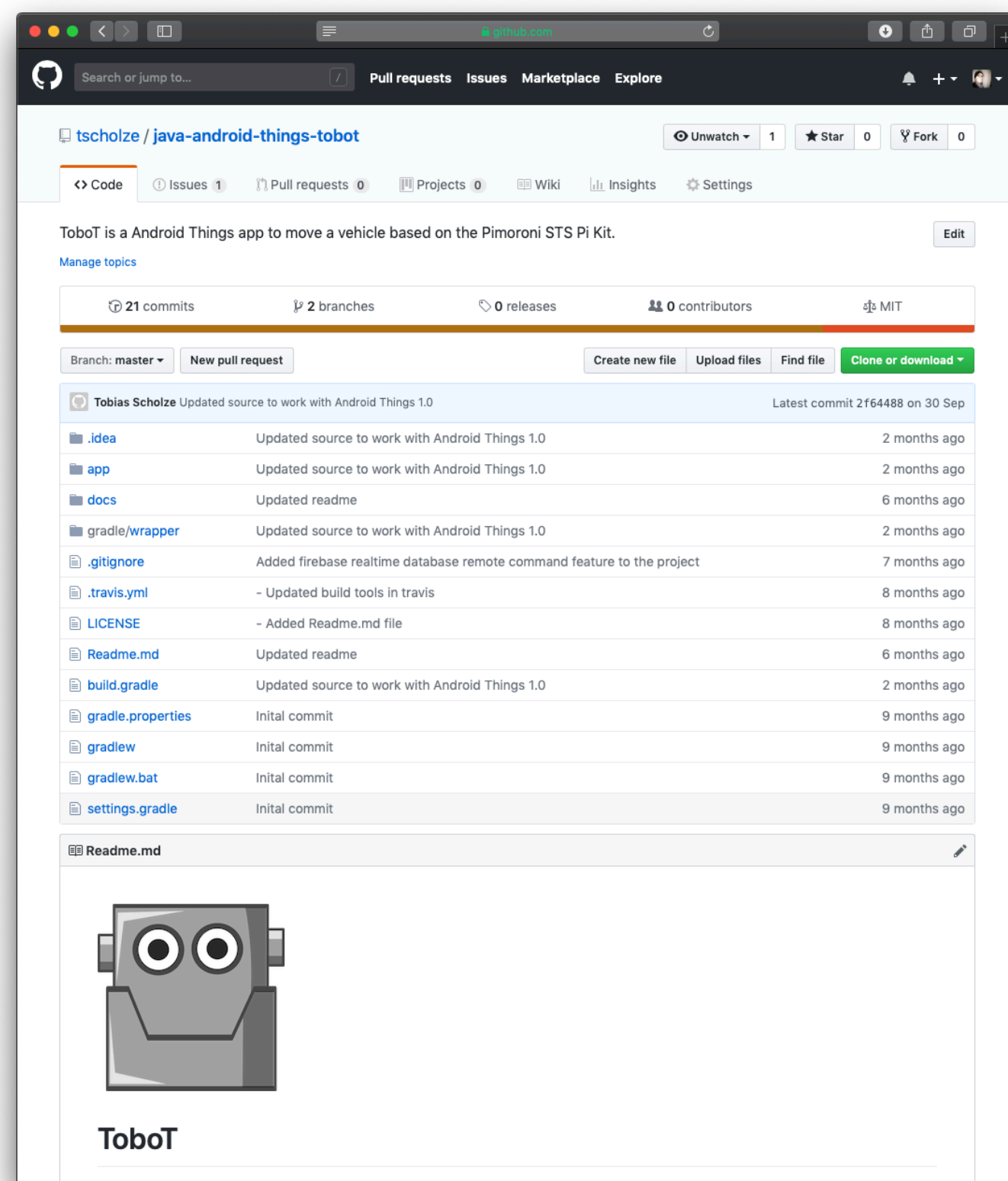
We remain dedicated to providing a managed platform for IoT devices, including turnkey hardware solutions. For developers looking to commercialize IoT products in 2019, check out [Cloud IoT Core](#) for secure device connectivity at scale and the upcoming [Cloud IoT Edge](#) runtime for a suite of managed edge computing services. For on-device machine learning applications, stay tuned for more details about our [Edge TPU development boards](#).



Special Thanks



Questions & maybe some answers



- Visit the ToBot [Github](#) repository
- Visit my [blog series](#)
- Android Things Community: [Google+](#)
- Actions on Google Community: [Google+](#)
- Tim Messerschmidt (GDR): [@SeraAndroid](#)

