Mechanical

General description

We propose to implement the ▮▮▮▮ in the format of a compact wearable device resembling a smartwatch, which could be wearable on a wrist with the help of a wristband or mounted on a ▮▮▮▮▮▮ with the help of a custom mounting adapter.

We propose to develop a ▮▮▮▮ with the shape of a rectangular smartwatch 40 mm diagonal, which will make the ▮▮▮▮ fit well on the ▮▮▮▮▮▮ while retaining the shape many users have already been accustomed to, if they prefer to wear the tracker on their wrist.

The figures below demonstrate the dimensions of the two Apple Watch form factors relative to the size of the ▮▮▮▮ the ▮▮▮▮▮▮.

Apple Watch Series 6
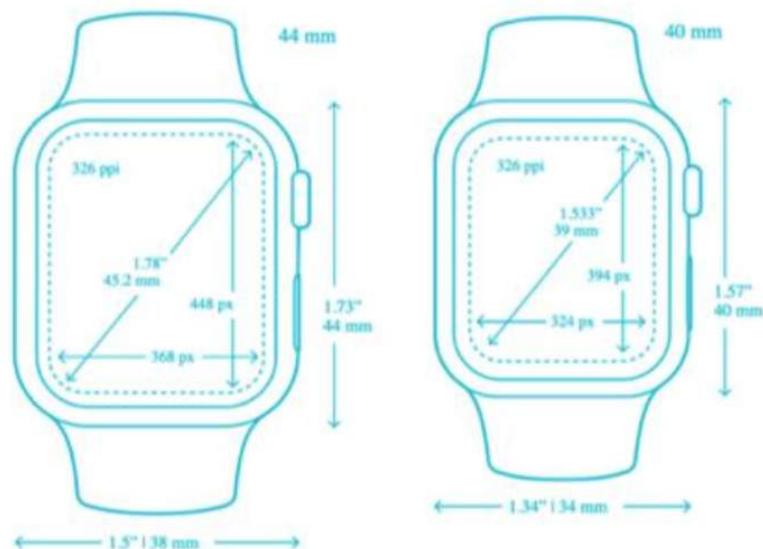
Placing the ███████ on the ███████ will likely require a smaller size tracker to be developed: the handle is thinner than the ████ and ██████ often place their palm at the edge of the handle, so having an object

Enclosure and materials

Plastic and silicone are the primary materials to be used in the design of the enclosure. The use of metallic parts is possible to achieve a premium look at the expense of increased cost.
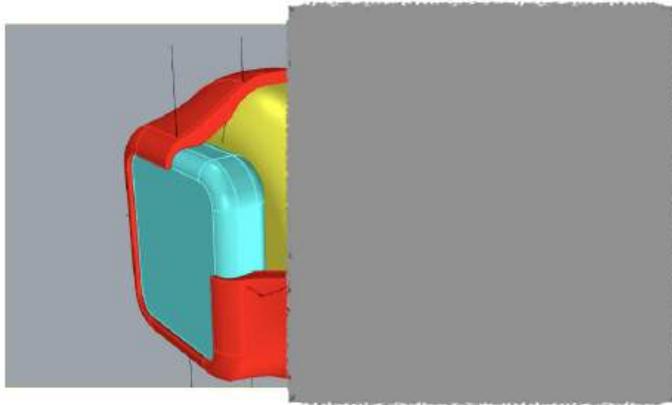
Wrist bands

An off-the-shelf wristband will be used similar in design to Apple-sold rubber bands for Apple Watch. The key impediment that prevents us from using Apple rubber bands directly is the patent on the Lock mechanism granted to Apple. At the same time it is entirely possible to source rubber bands from Chinese manufacturers that would carry a different lock mechanism.

Image	Description
	https://www.alibaba.com/product-detail/Smartwatch-Band-Smart-Watch-Pour-Sante_1600336957161.html
	https://www.alibaba.com/product-detail/Smart-Watch-2022-Hot-New-Trend_1600366031883.html

██████ mounting adapter

A silicone mount will be developed that will fix the tracker on the ████████████████. A sample design is provided below: a more detailed solution will be developed during the project.

Weight estimate

We estimate the weight of the device to be between 30 and 45 grams without the wristband or ▨ mount.

BOM of mechanical parts

| Part name	Description	Q-ty	Cost per 10k, USD
Enclosure bottom part	Plastic or metal - TBD. Injection molded	1	$1.5 - 2
Enclosure top cover	Gloss plastic with engraved logo Injection molded	1	$1 - 1.5
Wristband	Off-the-shelf part, rubber / silicon	1	$1 - 2
Charger contacts	Off-the-shelf part	2	< $0.5
Magnets	Off-the-shelf part	2	< $0.3
Assembly cost			
Total			**$5-7**

Electronics

General description

We propose to use a standard SoC based solution from ▨
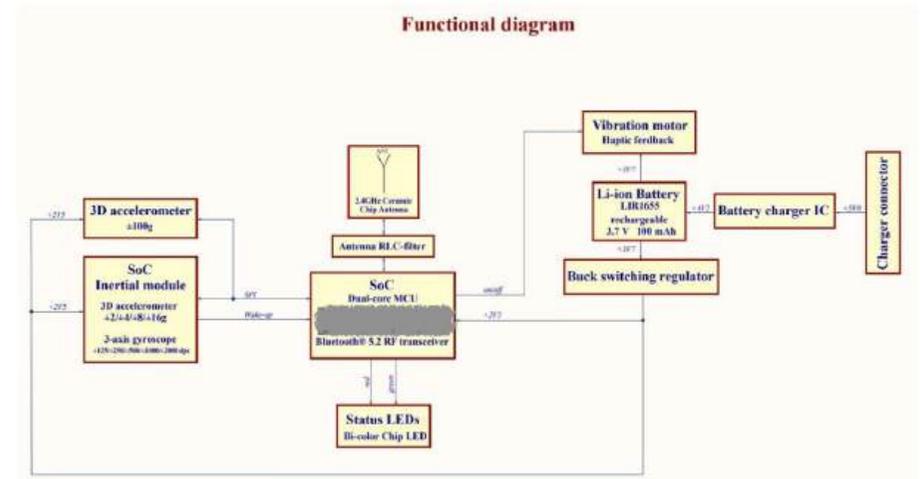
Battery and power consumption

We estimate that a Li-Ion battery of 100 mAh at 3.7V will provide appropriate levels of autonomy for the device.

Item	Specification
D	16.1
H	$5.5_{+0.35}$
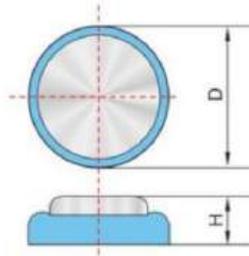
The power consumption profile of the device looks as follows:

High-performance mode, all components active:
- MCU: **2.1 mA**
- Radio TX: **5.2 mA**
- Sensors: **0.55 mA**
- LEDs, buttons etc: **0.5 mA**
- Haptic feedback: tbc

Total power consumption of non-idling device: ~8 mA (at 3.6V) + impulsive haptic feedback.

We estimate that the device will be able to function through at least 6-7 hours of intense training, which largely covers one or two full days of practice. In the deep sleep state the device will consume no more than 1.5 milliamps (when the device is not used or simply sits unpacked after purchase). This allows the ▮▮▮▮▮ to preserve battery charge for more than 5 days.
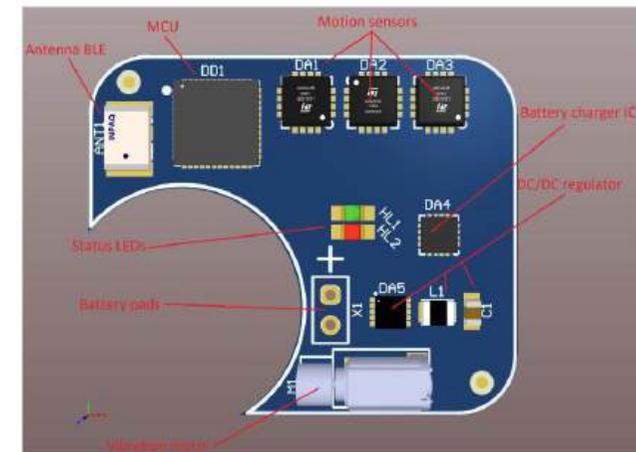
LED indication

Two LEDs will display the current status of the device: may be used for power status indication, pairing status, and for other features defined in software.

Device Layout
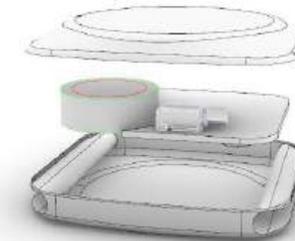
Exploded view of ▮▮▮▮▮ with main components

PCB with key electronics components