Bicycle Tracker

14 July 2023 0 Wim van 't Hoog 3D Printer Other

Intro

Cycling is a prominent activity in the Netherlands, but unfortunately, bike theft is also a common issue. Recently, my own bike was stolen, and I realized that filing a police report is often a mere formality without yielding significant results. To address this problem, I purchased a new bike and decided to equip it with a Bluetooth tracker. The concept behind this tracker is that if the bike is stolen, I can declare the tracker as lost, and other users with the same app can help locate the stolen bike. Alternatively, I can use the app to search for the bike myself, as the effective range of the tracker is approximately 30 meters.

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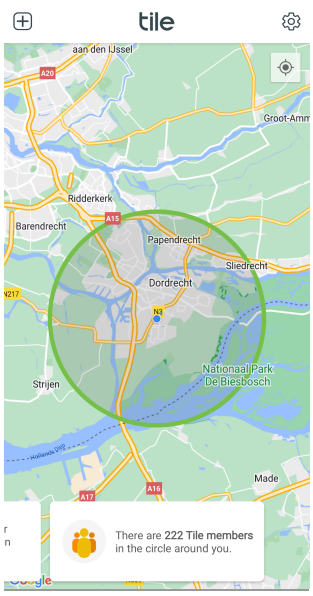
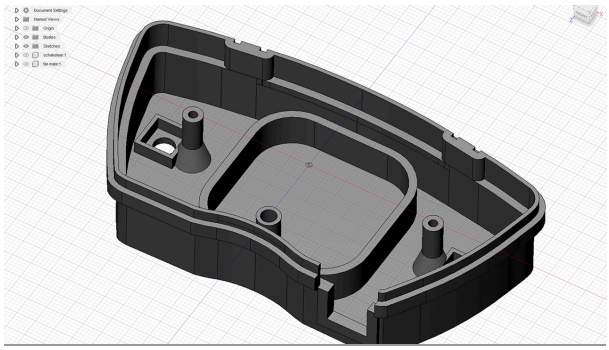
Choosing a Bluetooth Tracker



The first step I took was to select a suitable Bluetooth tracker. The key factor in this decision was the size of the tracker's network. Ideally, I would have chosen an AirTag from Apple, as it has the largest network. However, since I do not own an iPhone, this option would be impractical for me. Additionally, the AirTag emits a beeping sound when it loses connection with an iPhone for more than 24 hours, potentially alerting the thief to its presence.

Considering these factors, I opted for a Tile Mate 2-pack, as Tile has the second largest network and provides support for Android devices. I installed the Tile app and paired both trackers with my phone. Upon browsing the app, I discovered that within a 15 km radius, there are 222 other Tile users who can assist in searching for my Tile if I declare it as lost.

Concealing the Tracker



Next, I needed to find a suitable hiding spot for the Tile tracker on my bike. It is crucial to emphasize the importance of finding a secure hiding location. While many people using similar setups conceal the tracker under the bike saddle to protect it from sight and rain, I believe it is necessary to find an even better spot, as thieves may check the saddle area first.

Fortunately, my rear light had been malfunctioning due to a faulty switch. This presented an opportunity for me to address both issues simultaneously. I used Fusion 360 to design a new bottom half for the rear light, making it slightly deeper to accommodate the tracker.

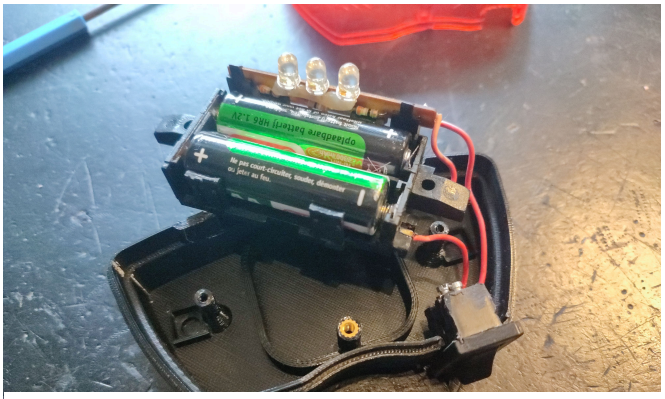
For those interested, the STL file can be found here. The rear light I used is a generic product manufactured by Techno and sold by Gamma in the Netherlands.

Original

Updated design

Let’s put all the components in place

Tile placed



Components in place

And assemble it on the bike

Side view

Rear view

Testing the Tracker

To test the effectiveness of the tracker, I asked someone to park my bike in an undisclosed location. The objective was to simulate the theft of the bike and my subsequent attempt to recover it. The first step was to declare the tracker as lost, thereby requesting the Tile community to passively search for it.
The results were highly impressive. Within just 15 minutes, my bike was located, allowing me to reclaim it. I fully intend to employ the same strategy if my bike is ever stolen again, although I may also involve the police once it is found.

Potential Upgrades

Bluetooth LE *(Low Energy)* trackers like the Tile, along with other similar options, typically have a battery life of approximately one year and a range of around 30 meters. However, there are alternative techniques available that may be even more suitable for object tracking. For instance, LoRaWAN GPS trackers offer a much larger range, often nationwide, depending on the coverage provided by The Things Network. These trackers also boast impressive battery life, ranging from six months to several years.

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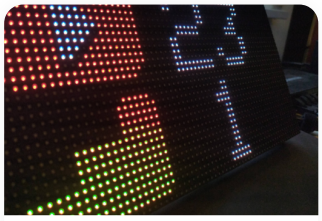

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