

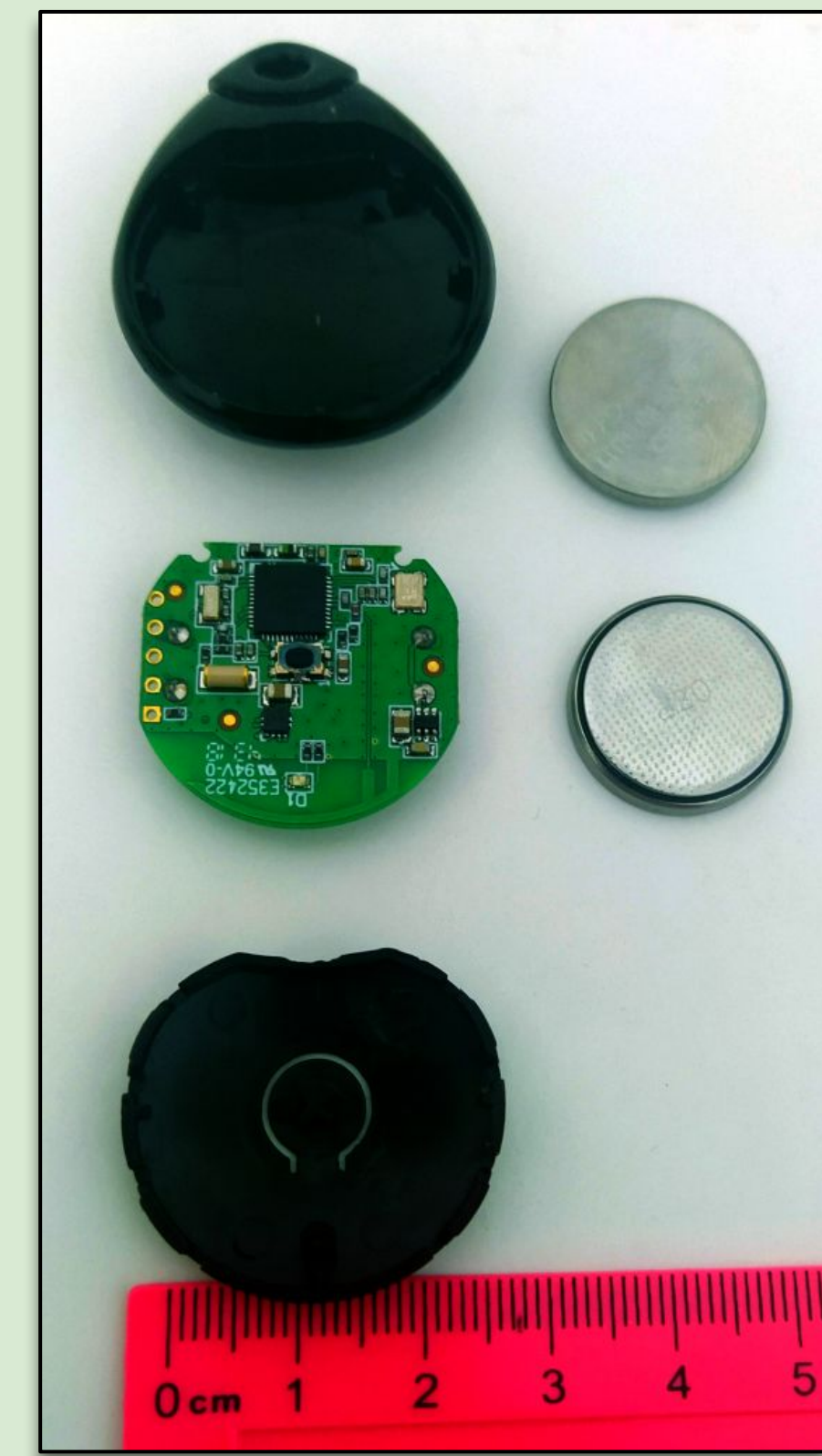
### Introduction

In the modern world often we are challenged with finding lost items, pets and even harder challenge is finding people with disabilities who get lost in unfamiliar places. Our project aims to assist in such searches using technology widely available in the modern world.

Meir Hayman from ERM Electronic Systems Ltd along with technology advisor Eran Katzav and Holon Institute of technology have assembled our team to develop an Android application to provide a solution. Our application is using smartphones BLE technology to locate beacons emitting BLE packets, which are then aggregated to cloud storage and delivered to the beacon owner on request to build a "route" towards the beacon's last suspected location.

Using this crowd sourced information we are then able to provide estimate of location to beacon owners and help narrow down the search in populated areas.

### Beacon device sample



by ERM Electronics System Ltd

### BLE (Bluetooth Low Energy) technology

One of the main technologies this project is building upon is BLE. BLE is able to share bandwidth with normal bluetooth to transmit short packages of data (for example unique identifiers).

Off the shelf products are sold (e.g. ERM's beacons or Apple's AirTag) which allow creating "beacons" which transmit BLE packets which can then be detected by smartphones.

We are using this technology to locate such beacons in a distributed fashion using volunteer smartphones to provide location hint for where to begin the search.

### Privacy concerns

In case of pets or items the privacy matter is mostly relevant to smartphone owner, but also we aim to help locate people with disabilities where along smartphone owner the beacon target's privacy concerns are of utmost importance.

To handle this matter we chose to keep and transmit the minimal amount of private information in our system, for example, in case a beacon is not actively searched for recently then no data about located beacon is transmitted from any smartphone to the cloud database so vast majority of location information should never leave local devices and is forgotten as soon as possible. This is also the principle we used for all user data in our project.

### Discussions

During the project many ideas have been suggested, some of which had to be turned down due to time constraints, privacy or other issues, but they included building a social network, better beacon sharing methods, marketing and more, some of which we have detailed in the project book.



YouTube



GitHub



### Conclusions

Our application is functionally complete, however there is a long way to go as the application relies on crowdsourcing it's location data.

Therefore to achieve the goal of deploying this application in a way where it becomes helpful to people will require a considerable effort in marketing and publicity.