

An-ti Loss App

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ABSTRACT

This project is about an application based on the Android platform and can prevent children or items from being lost. The application can alert both devices when the distance between two devices is about 50 meters, synchronizing real-time location information and camera content to the other device.

KEYWORDS

Android, Anti-loss, Hot spot, spring-boot

1. Introduction

I have a very young brother. When I took him to play outside, I was anxious about him getting lost. Because once he got lost, he would not tell me where he is by phone or message as an adult. When I am in a busy airport, sometimes I may forget the luggage, which is a terrible thing for travel. And it is difficult for me to find it quickly after a loss.

With this application, When my young brother and I are not together, I can always know what happened to him and what is around him to find him quickly.

If I put an Android phone with this APP in my luggage, I can get real-time reminders and retrieve them when I forget my luggage.

2. Hardware and Software

2.1 Hardware

Application based on Android platform. Only two Android mobile phones are needed. I am using a Xiaomi 9 SE and a Oneplus 7 Pro to test.

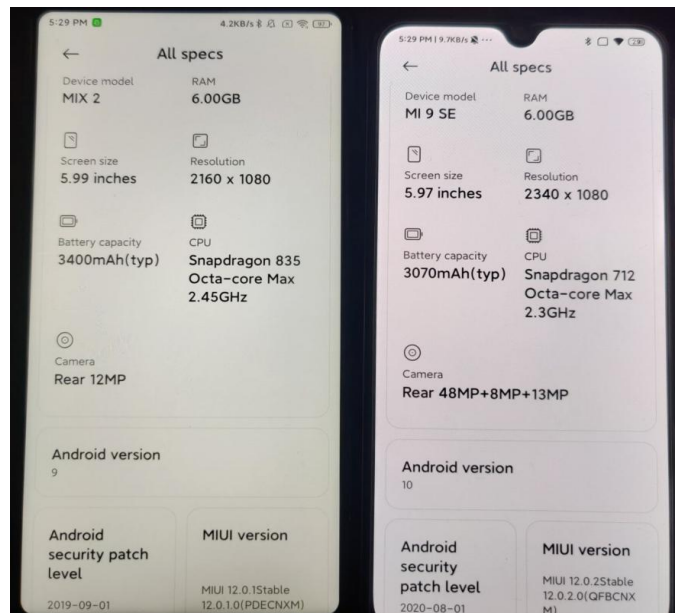


Fig1 Xiaomi 9 SE and a Oneplus 7 Pro

2.2 Software

Android studio 4.1

JAVA JDK: 1.8

org.springframework.boot: 2.3.4.RELEASE

3. Design and Implementation

For the overall structural design, I designed as: First, the two devices are paired through the hotspot. If the hotspot is disconnected, it enters the lost mode. At this time, the network sends device latitude and longitude information to another device every 5 seconds, so GPS determines both parties' location. And the device will automatically take pictures and sends an image to another device every another 5 seconds.

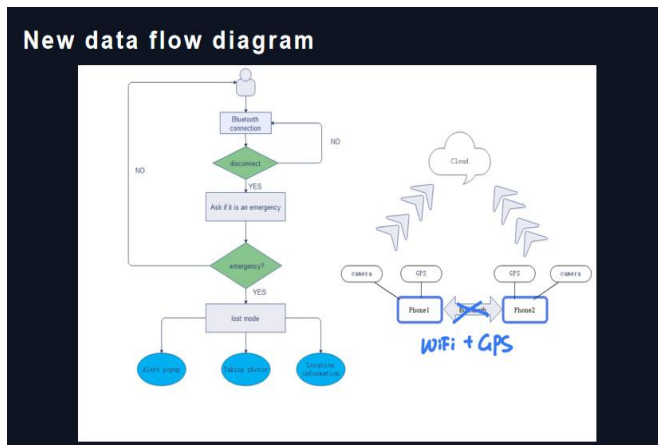


Fig2 data flow

I use Android Studio 4.1 on this project. I created 10 different pages using Android Studio. They are: BaseActivity, ChatActivity, CameraActivity, GoogleMapsActivity, ChildDeviceLinkActivity, ImageViewActivity, MainActivity, MainDeviceLinkActivity, TypeSelectActivity, and ZxingActivity.

The following figure explains in detail the way of back-end data transmission.

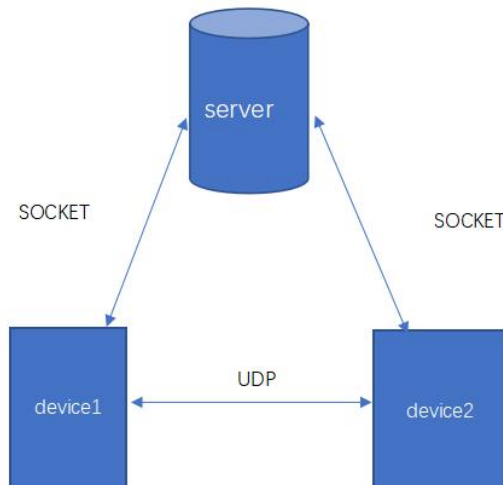


Fig 3 data transmission

Device 1 turns on the hotspot for device 2 to access. After device 1 is connected to the hotspot, it maintains UDP real-time communication with device 1. When the appliance cannot connect with a poor WiFi signal, the device cannot maintain UDP communication, and device 2 will enter emergency mode. The network sends device 2 latitude and longitude information to device 1 every 5 seconds, turns on the camera to take pictures, and sends photos. Device 1 can find the location of device 2 through latitude, longitude, and pictures.

When device 1 and device 2 are connected to the server, they have a WebSocket connection. When the UDP communication between device 1 and device 2 is disconnected, they can send messages to each other.

4. Evaluation

After actual testing, in an outdoor environment, the two devices automatically disconnected at a distance of about 50m and successfully entered the loss mode. At this time, the two devices will automatically connect to the cloud server through the network. Then send location information and photos taken by the camera to another device. In an indoor environment such as a restaurant, two devices can enter the loss mode at a distance of about 30m.

5. Conclusion

This APP is developed based on the Android platform and uses two Android devices as hardware, which Can provide an anti-lost function. When the distance between the two devices is about 50M, the position information will be automatically provided to the other device. So that user can Easy to find lost children or items.

6. References

<https://github.com/lxy-go/SpringBoot>
<https://github.com/liujingxing/okhttp-RxHttp>