Shout Out V2.1
Online Chatting Application

CS 656 Programming Project Report

Group 4

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1. Introduction

1.1 Briefing

Shout Out is an online chatting app, which use to communicate with your family and friends. Functionalities include add and delete friends, one on one chat with text, image and voice messages, build group chats. Other features include update your introduction, show your message sending and receiving time, show your online status and latest online time. We also left some function APIs in the app for upgrading purpose in the future.

Currently, android is the only platform to run this application. Most of the designing ideas come from Wechat, a mature worldwide communication application.

1.2 Development and running environment

Shout out was built on the latest android studio 4.1.3 via windows 10 OS system. Although signed APK is provided by our group, an android studio virtual emulator is still the best way to run it at the moment. You could also use a developer model android phone to run it.

When you import our project on your computer and run it, please make sure to include the manifests document and use the dependencies we provided.

1.3 Tools

Android studio 4.13 is the main developing platform. The backend coding language is Java. A Samsung Galaxy Amp2 was used as the test phone.

Three third party library was used in the application. 'com.theartofdev.edmodo:android-image-cropper:2.8.+' was used for profile image cropping, 'de.hdodenhof:circleimageview:3.1.0' for circle image view, 'androidx.legacy:legacy-support-v4:1.0.0' for image showing. If you would like to run this app on your computer, please make sure to add them in dependencies.

Google firebase realtime database was chosen as the application's database.

2. App Functions

For more details about the functions, please check our demo presentation.

2.1 Register and log in

Currently, you could register to Shout Out v2.1 via your email address in a second. Please just remember to use the correct email format, if this requirement is not made, an error exception will occur and you will be noticed. Email register is the only way to register and log in

currently. However, we left a phone number register API but did not have enough time to deliver it yet.

2.2 Write and update profile information

The first thing you would like to do after your registration is to write your name, profile image, and a short sentence you could like to share with your friends. We'll initial you to this page after your registration success, and you could always come back to change your introduction and profile image, but you could only write your name once since this text field will invisible after you confirm it.

2.3 Add and delete friends

You could always send a request to add a person to your contact. On the request page, you could see all the requests you sent to others, and the requests other people sent to you. You could choose to accept or deny requests from others, in the meantime, you could withdraw your request before someone else accept it.

You could also delete a person from your contact by click delete this friend (you need to find this person from find friends in the setting button first, then handle deletion from there).

2.4 One on One chat

After contact is established, the first thing you want to do is chat with your friend, you could do that on the chat page. Choose your friend and send your first greeting. The message will be delivered with a sending time combined.

2.5 Group chat

You could build a chat group by yourself and name it, you could find this function in the settings button on the right up corner of the main page. Everybody in the chatting group could see your message at the same time and get back to you.

2.6 Send image and voice messages

This function is currently restricted to one on one chat. You could click the image and voice message button when you chat with your friend, then select which type of message you would like to send. Then record your voice message or send an image from phone documents.

2.7 Check your friends' online status and last online time.

On the contact page, a green dot will be shown if your friend is online, otherwise, an offline mark will be shown. On the chat page, you could find your friend's last online time under his/her name.

3. UI designing

There are many well-designed chat apps out there, the Shou Out UI design is a simulation of WeChat. Our philosophy of UI designing is, easy to read, easy to use, easy to go.

3.1 Overview

There are 3 parts to the app include registration and login, the main page, settings.

On the main page, you could choose chat, group, request, and contact. Four tabs lined up on the top margin. The setting toolbar is up to the right corner. See Fig.1 below.

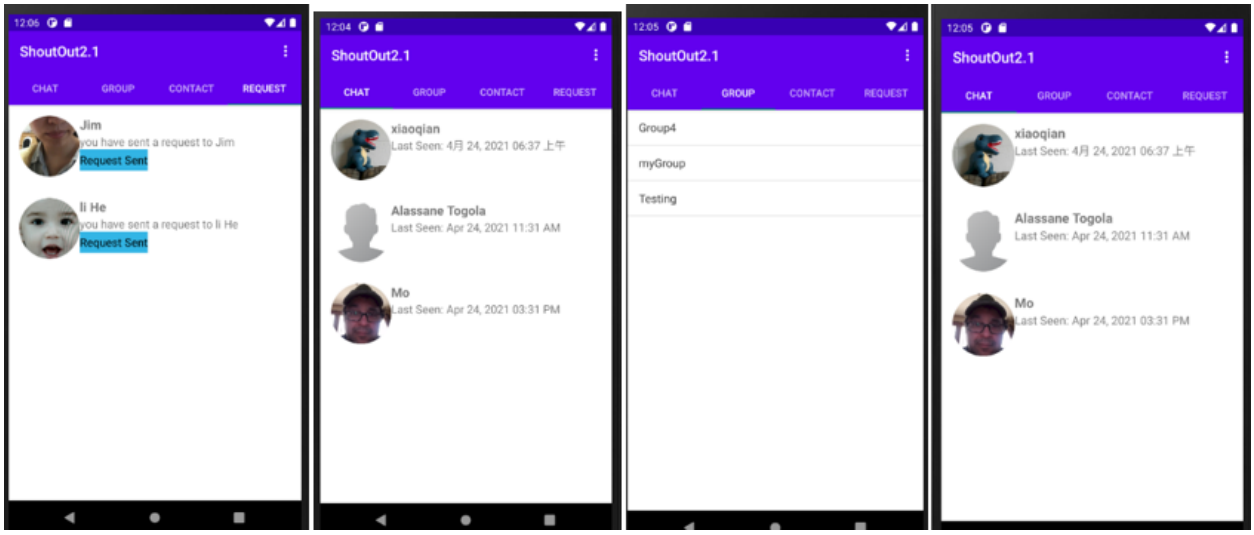

Fig. 1 tabs and UI view from the main page

The chatting page will be the most useful page for this project especially the one-on-one chat page, so we could like to design it as conveniently as possible. An example screenshot is shown below. For more details, please watch our demo video.

Fig. 2 chatting page view

3.2 Details

To make people easy to use, we designed many hints in our app. Some are implemented with hint functions directly, some are using Toast methods, some are shown as loading bar. Please see the examples below in Fig.3

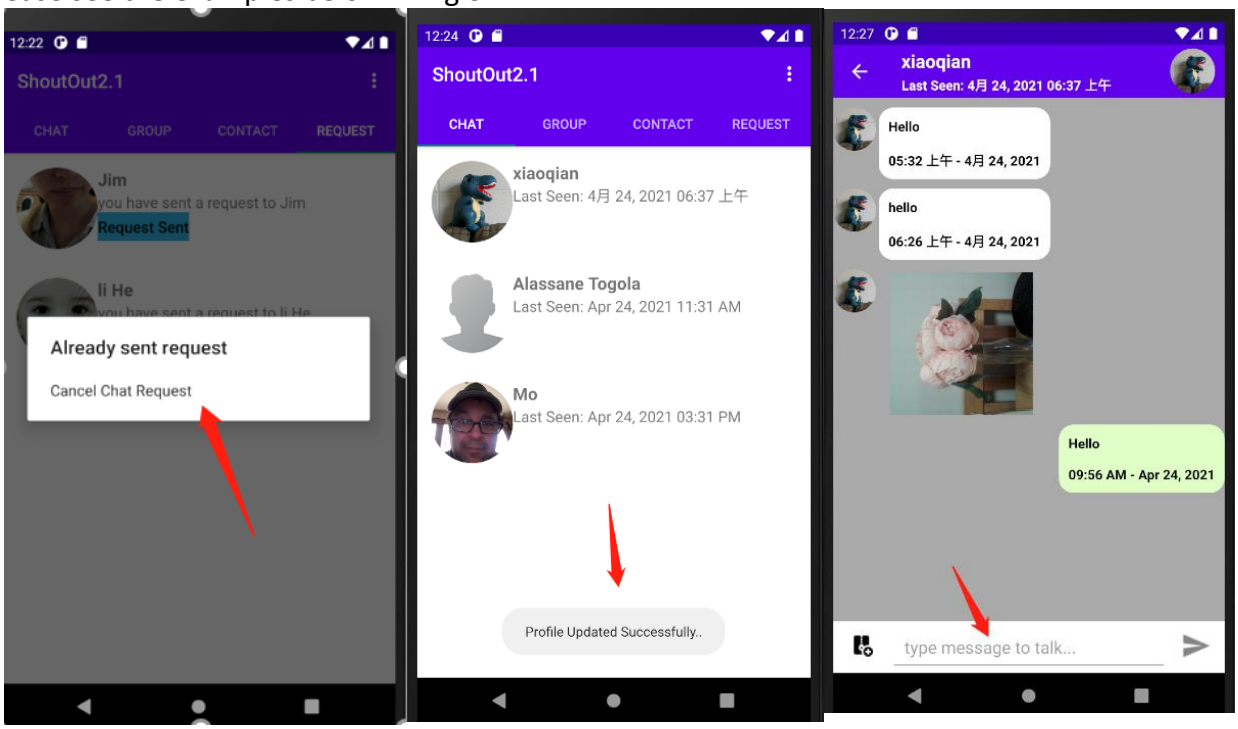

Fig. 3 Hint examples

4. App architecture and modules

4.1 Key activities and modules

As figure4 shows below, there are 3 keystone modules in this app, we also have another module as the center hall of the building, to connect all the modules.

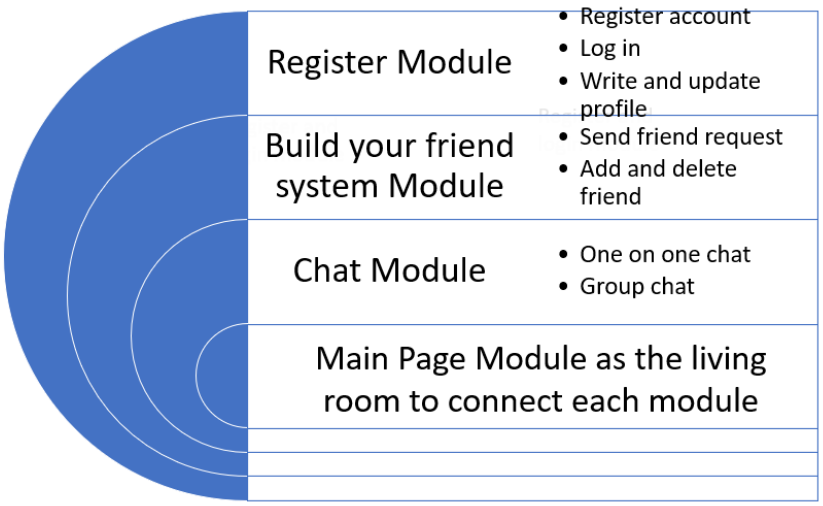

Fig. 4 App Architecture and functions design

4.1.1 User registration Module

First is the user registration system include register, log in, set and update your information. In our design, the onStart page is the login page, because most of the users already have an account. But you could easily jump to the sign-up page if you don't have any accounts, we designed an onclick button here to help users out. The only move you could make is either login or sign-up. Once you are signed up for a new account, it will bring you to the update personal info page directly, you don't have to go back to login page and login again.

Controllers use in this module are related to register and update personal information. For example, UpdateSettings() , RetrieveUserInfo() CreateNewAccount() , we use these methods, to update, retrieve user profile information, and create a new account, you could find more details in our source code in Github.

4.1.2 Add and delete contacts Module

This is the module for users to add and delete contacts. This function is assembled into settings options. Once you add someone into your contacts, one on one chat option is activated. Please check RequestFragment.java in the source code for more information about this module.

4.1.2 Chat Module

This is the module for users to chat, functions include one on one chat, group chat, chat by text, image, and voice. Controllers include SendMessage() and so on. In SendMessage() method, we check if the message is empty, a Toast hint will write to users, to tell users to input messages. Else, messages, will be recorded and the sender and receiver information will be retrieved from the database, then we use a HashMap to make sure the message of the same words could be counted either. After all, the database is updated and we'll show this message to the appropriate receiver.

More about this module could be found in ChatActivit.java, ChatFragment.java, GroupChatActivity.java.

4.2 Modules connection

The main page is where all the modules connect, for a new user, what he will do is 1. Register 2. Add contacts 3 starts to chat. So we use the main page as a holder for users to connect all the modules. For example, he could add a friend he wants to talk to, then start to talk by chat, or go to module one to update his profile image.

5. Database and data structure

The database we use for this app is google firebase, as we all know, firebase is a cloud database that is NoSql. So a tree-type data structure is built for Shout Out V2.1.

We designed 5 subtrees with roots of users, messages, groups, contacts, chat requests.

5.1 Users Tree

In user tree, we have root node “Users”, along with children nodes image, name, status, uid, userState. uid is the unique key for the users. userState also has children nodes date, state, time.

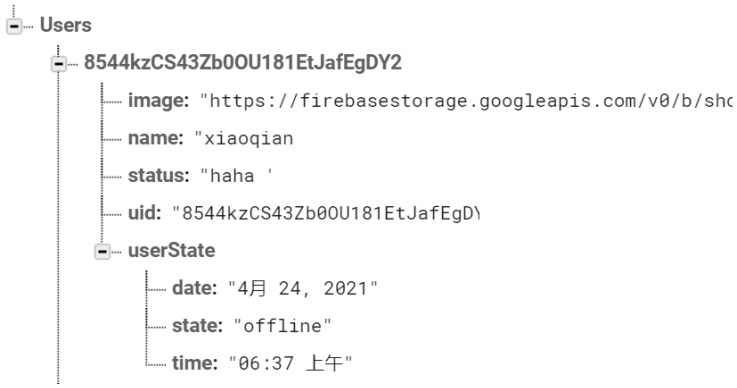

Fig.4 Users Tree

5.2 Messages Tree

Messages tree contains all the messages through the app. Sender’s uid will be the first level child node, then receiver’s uid as the child node of sender’s uid node, then unique key node as the child of receiver’s uid, in the bottom level, date, from, to, message, messageID, time,type will be the children nodes of the message unique key.

Fig. 5 Messages Tree

5.3 Other subtrees

Other subtrees include groups, contacts, chat requests. The structure of these subtrees could be found in fig.6 below.

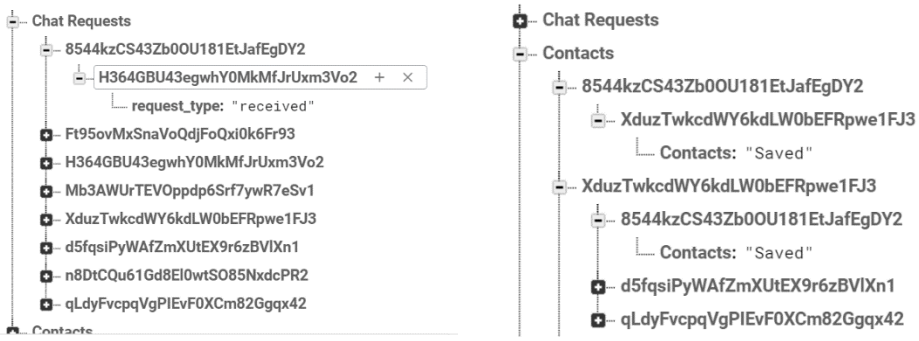

Fig.6 Chat request subtree and Contacts subtree

6. More resource

Please watch our video with the app demonstration. At the same time, you are very welcome to join us for the future upgrade of the app, please find more details in the project's GitHub.

Demo video: https://youtu.be/3BgD4IVe7HY
Project Github: https://github.com/konaer/Shout_Out2.1

7. Reference

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