

Building a lunch meet-up application for students

Computer Independent Project

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(jointly done with **Jørgen Duley** and **Tijmen van Dien**)

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Supervisor

Prof. David Rossiter

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Abstract

Our life have been dominated by technologies, we are addicted to the media, mostly to social media. Everyday we are using our smartphone or computer, seeking news or updates from friends/family. It has become an inevitable part of our life. And yet, we often missed out the change to communicate with other people, an interpersonal connections.

And so nowadays, teenagers are afraid to communicate with others. Hence, the paradox emerges; if technology brings benefits for convenient and wider social connectivity, why is it such an issue to draw people from the virtual world back into reality? Can we reverse this rising trend?

1. Introduction

The Idea of the application came in when I was eating alone in the school canteen, I looked around and saw multiple people eating alone, staring at their phone. Ironically, these people might have a great opportunity to be friends, putting down their phone and talk with each other. I forwarded this observation to Jørgen, and he was intrigued.

Social barriers make it strange for people to say hello to each other. People are complaining about how difficult and awkward it is to meet new friends in HKUST. However, interpersonal connections through internet, removes this immediate obstacle. Ergo, this would allow for a less troublesome first encounter among each other, especially introvert students. Not only meeting friends, some would want a person to share their interest with, which most of his or her friends does not share. Additionally, some people would like to achieve something and want to find his companions.

Having an app to put the burden of first encounter is not something new. There are multiple examples out there, like Tinder, Match, Facebook, and so on and so forth. However, some of these apps rely on dating, or require a number of personal information. What if someone just wants a simple, convenient and fast way to meet new people whom also shares their interest?

With the above thinking in mind, the idea of **Chatfer** transpired.

2. Chatfer

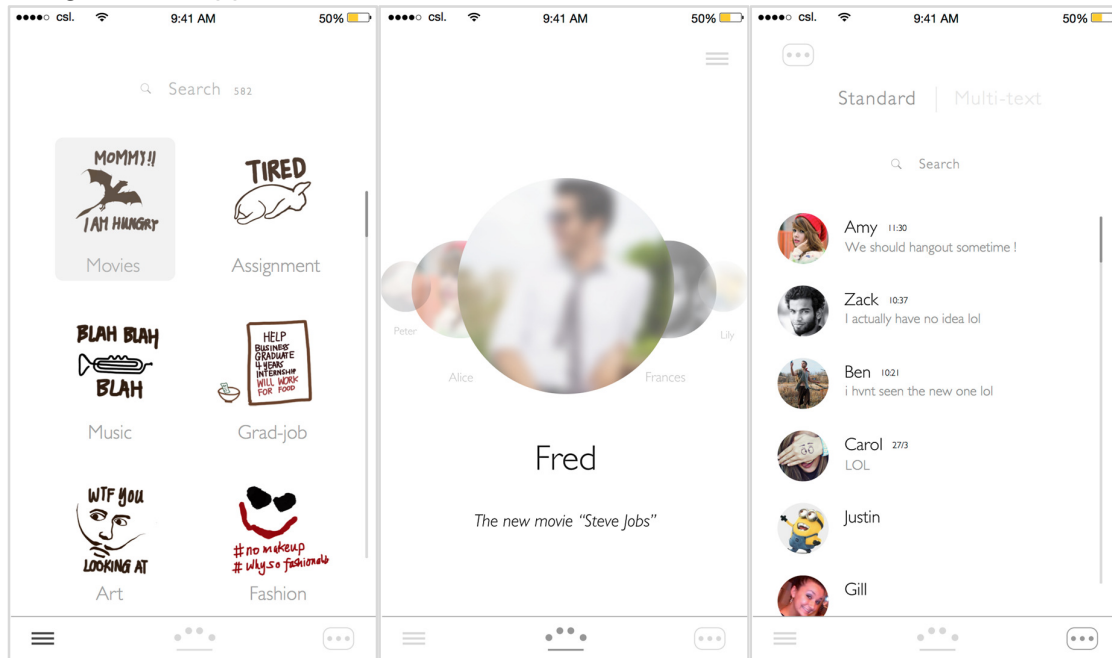
Chatfer is an app aiming to bring an interpersonal connection to people with similar interests and similar goals together. The problem we saw in school is that most students have difficulties finding likeminded students, most of their friends are group mates or O-camp mates which most of them are acquaintance. Even if students participated in different events, the chances are still low. That is the reason why we are trying to build this app to solve the problem.

Our vision is not only about finding friends, we want Chatfer to be an app that people can use it for varieties of reasons. For example, a student who wanted to try to build an app can use the app to find a partner who is excel in programming; a student who wants to make a short film can use the app to search cameramen, director; a student who wants to consult a senior student for advice in a certain company he or she had done internship in.

Not only for students, we also hope that the app can be launch among the public which to increase the diversity for the users. Moreover, as the we want real person connections between users, it is difficult for users from different nation to meet with each other, and so we have a bold vision of combining Virtual Reality to the app one day that allow users to have a friendly engaging conversation through VR glasses with people from different nations, to make our user feels like a real life conversation with all people around the world.

3. Design

The design for the app is minimalistic, as we understand that apps nowadays are not as much attractive as before. A streamlined, minimal and intuitive app will grant a more enjoyable experience for the user. The following will show the user interface design for the app.



The main page for the app (center) contains the function for searching potential students with similar interest. Users can view other students by swiping. The users profile pictures are blurred because we do not want people to connect only because of appearance. Once a user connects with another user, the blurring function will decay in a rate that the nearer to the meet-up, the clearer the profile picture will be.

The category page (left) allows users to choose different kinds of categories they enjoy or find interesting. The category function can help users to find better matching results with other students.

The messaging function (right) is basically the same as other apps, it is made for users to communicate before their meet-up, to locate and get to know each other. Yet we have added an exciting function. As we understand first message is usually awkward and people are often too nervous on the opening line. Hence, we will create a break-the-ice message generated from our database which contain thousands of funny text messages. We would like to use this function to break the ice and give users a enjoyable and funny experience to start off their conversation with their connected person.

4. Features and Implementation

The app features several social functions, and for the technology part, we use Xamarin, a cross platform which allow us to performance the application on IOS, Andriod and windows platform altogether. So we will not need to write the code separately. For the backend part we used Microsoft Azure (.Net Core) for data storage. The Azure notification hub is used for sending push notification to users. Also by using a hamming distance between two users to calculate matches, it allows us to compare 50,000users in about half a second which is a maximize efficient performance. The frontend part is implemented by Jørgen Duley and the backend part is implemented by Tijmen Van Dien.

4.1 Registration

When the app launches, the app will look up the unique device ID which will be used as the unique identifier for the user. The main benefit of this, is there is no need to have a password, as well as it is impossible to have more than one account. It is similar to how WhatsApp works. The server (which resides in Netherlands), returns a unique token based on the device ID which will be used throughout each session. Every communication is done through asynchronous secure HTTPS calls over the internet.

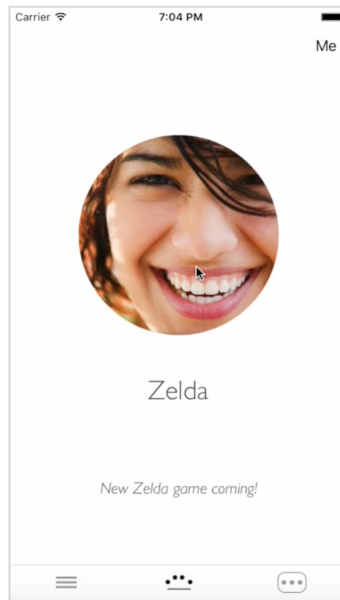
Following the creation of an account in the first run, the user is asked to select or take a photo. The photo is then automatically compressed and converted into a byte stream to avoid heavy server load. When the user is presented the chosen photo, which has been applied a circle transformation, the user will be shown a simple slider which applies a blurring transformation corresponding to the slider value. The user will then continue and the photo will be uploaded to the server as a byte stream using a HttpClient with a JSON header as a string content.

The following steps are adding the user name, status, interests and email address. All the steps in the registration phase would not have been possible without a number of open source libraries (Json.NET, FFImageLoading, etc.) provided as NuGet packages for Xamarin.

4.2 People Page (Landing Page)

Once the registration is completed, the user will be shown the users based on the interests chosen in the registration. The results are returned based on a ranking

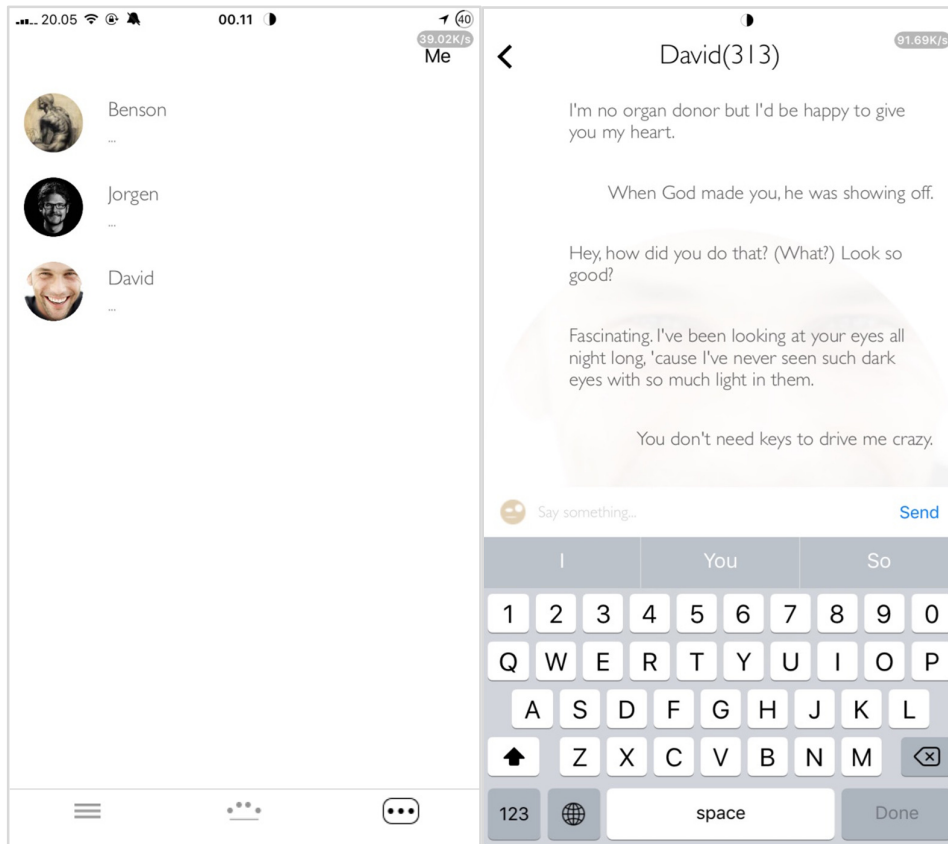
scale. The users whom have the most similar interests, are given a rank of 0 and is presented first. The users with less matching interests are then given a lower (higher in terms of numbers) ranking. 10 users are being returned by the server each time the user lands on this page (People Page).



Due to limitations in visual design provided by Xamarin, the way to see different users is simply by swiping the the right, which is achieved using a Carousel Page, with each user as a child Content Page. Every user is clickable, allowing the user to advance into the user profile to see their interest and choose to send a coffee or meal request. There will also be some interesting and funny guidance to get a user starting a conversation after the first connection.

4.3 Chat

The chat is mostly like any other chat client out there. And this is also where Xamarin showed its limitations in a greater scale. The chat is implemented using a list of child views with separate templates for receiving and sending messages. The tricky part is handling the view when the keyboard is showing on the screen. The ideal way is the entire view to move up, while having the entry field to be pushed up accordingly.

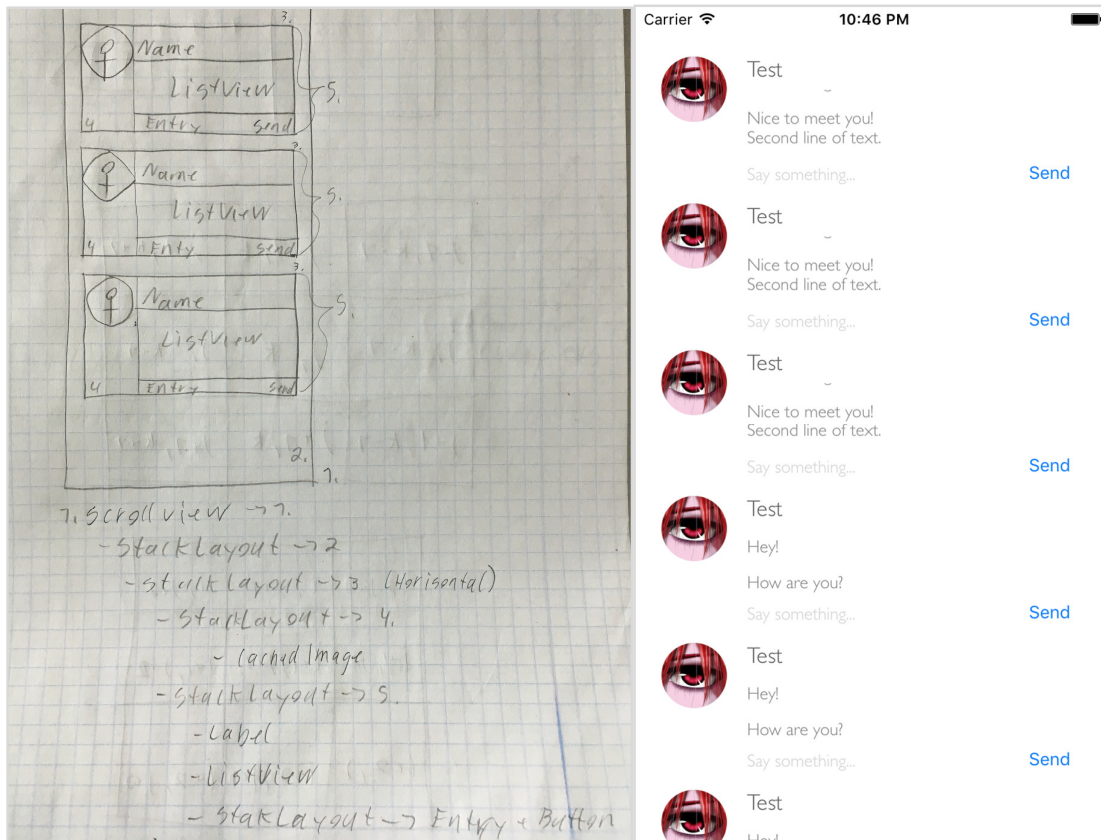


However, the only way to achieve this, is by having the entry field inside a scrolling view, as to scroll/push/move it up when the keyboard is shown. This means there needs to be a parent scrollview who has a child of views inside a list that is also scrollable. The result is not optimal, as this pushes both views up. Also, when scrolling through messages, you are scrolling through two views which inherit scrolling. This causes some visual artifacts and partly ruins the streamlined experience. Aside from this issue, the chat is working decently.

4.4 Multi-Text Chat

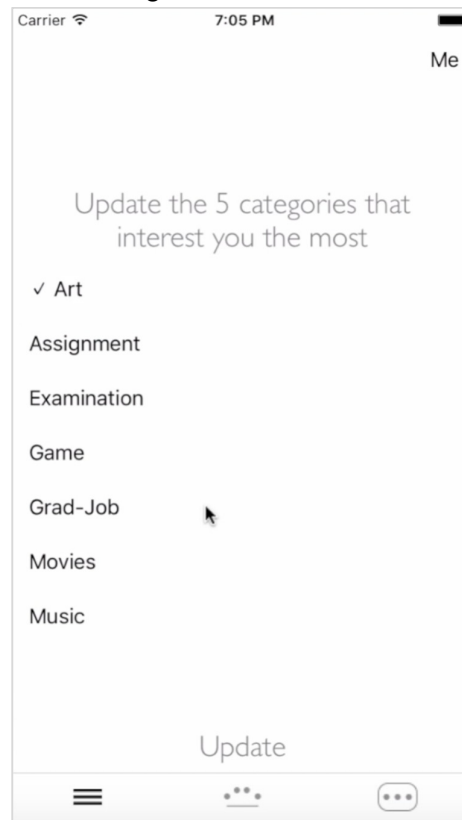
Apart from the standard chat, Jorgen experimented with implementing a new chat function that we called the Multi-Text chat. It's different from the standard chat functions in most app in the way that every chat is available in one page. Meaning there is no need to press into the specific chat to communicate.

Messages can be sent to multiple recipient quickly using this approach. Interestingly, Jorgen had less difficulties implementing this than the normal chat as well as fewer bugs. The sketch for this and the actual way he followed for implementation can be seen below.



4.5 Interests (Categories)

The final page is the Interest Page that allows the user to update its interests as mentioned in the design. Ideally, the categories should follow a flowlist design, but due to several technical difficulties, Jørgen settled on a simpler and workable approach, using a listview with strings.



4.6 Summary

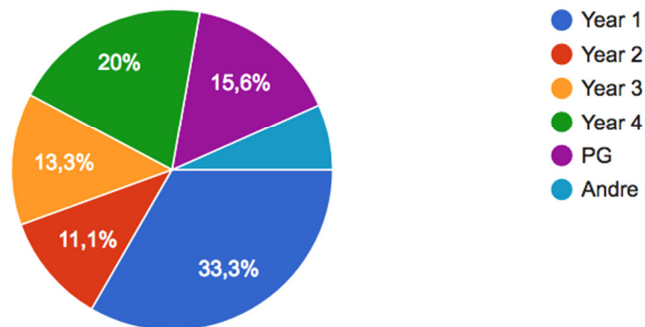
In general, Chatter has been designed and implemented from ground up using professional sketching tools, multiple drawings and testing of several implemented prototype designs to attain a streamlined and intuitive user experience with native platform performance.

5. Conclusion

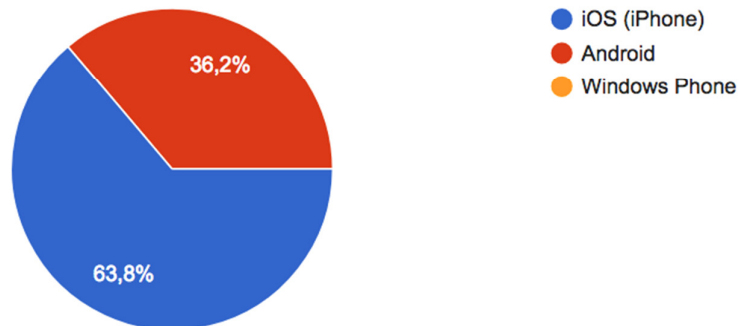
5.1 Results from signup form

We put up posters at random locations in the HKUST campus, including the canteen in LG7 and LG1. In just under a month, we had more than 50 signups, and this gave us some interesting data as can be seen below:

Which year are you in?



Which platform are you using?



As can be seen from the sign-ups above, the majority of interested students are either year 4 (33.3%) and year 1 (20%). As well as mostly iOS (iPhone) users (63.8%), and no Windows Phone users. Even though Chatter is also deployable on unified Windows platforms due to the .Net support, it seems unlikely that there will be demand for a Windows Phone version.

5.2 Closing Remarks

Chatter has been an amazing experience for me, this is my first time collaborate with a programmer to work on a mobile application project, we have encounter many setbacks and yet we have overcome it one by one. Building an app is a totally

different experience than doing school work, it is harsh and it took months to progress. And even when we overcame an issue, another one would immediately emerged. We had moments when we were exhausted and nearly gave up, yet the passion and the eagerness to see the product drove us to get back to work. So the overall experience is tiring yet amazing.

Not only for us this is the first time building an mobile app, for me it is also the first time I exposed myself to design. I learn a lot during the process, from how to design an interface to understanding how the user interface change how people see the applications. For the technical side, we tried to use a cross platform programming language to try out. The program is pretty new so there are not much library for us to take reference, yet we think that Xamarin is still a great solution for building apps as it can integrate with both IOS and Andriod in an easier manner than the traditional way although the debugging process is extremely painful.

All in all, building an app is not only about design and programming, we also realized that user feedback is utmost important. During the process we have been receiving advice from out friends and professors, we have learnt a lot from their opinions. We will continue to perfect the app and hopefully it will really help students in HKUST to meet their friends.

6. Appendix

6.1 Minutes of the 1st meeting

Date: Monday, 6 Feb 2017

Time: 10:45 am

Place: Room 3512

Attending: Prof. Rossiter, Jørgen Duley, Benson Ng

Absent: None

Recorder: Jørgen Duley, Benson Ng

Approval of minutes

The minutes of the last meeting were approved without amendment.

Report on Progress

Showing of the idea and design/implementation choices

Discussion Items and Things to Do

Design changes and further implementation of prototype

Meeting adjournment

The meeting was adjourned at 11:15am

6.2 Minutes of the 2nd meeting

Date: Wednesday, 15 Feb 2017

Time: 5:00 pm

Place: Room 3512

Attending: Prof. Rossiter, Jørgen Duley, Benson Ng

Absent: None

Recorder: Jørgen Duley, Benson Ng

Approval of minutes

The minutes of the last meeting were approved without amendment.

Report on Progress

Progress on developing cross-platform elements, in particular photo capturing and selection, as well as handling client-server communication.

Discussion Items and Things to Do

User-selected blurring and artistic effects (i.e. cartoonization) on photos to preserve anonymity. After two users connect, the blurring should gradually go away, as to let the users see whom they have connected to once the meeting time approaches.

Meeting adjournment

The meeting was adjourned at 5:30pm

6.3 Minutes of the 3rd meeting

Date: Friday, 17 Mar 2017

Time: 4:30 pm

Place: Room 3512

Attending: Prof. Rossiter, Jørgen Duley, Benson Ng

Absent: None

Recorder: Jørgen Duley, Benson Ng

Approval of minutes

The minutes of the last meeting were approved without amendment.

Report on Progress

Working prototype. Main focus on iOS platform, as Android caused several development issues using a cross-platform approach. Server-side, using Microsoft Azure, mostly finished, with scalable matching architecture relying on *hamming distance* on interest match.

Discussion Items and Things to Do

Simplification and better user interaction for improved intuition. Focus on getting user feedback.

Meeting adjournment

The meeting was adjourned at 5:00pm

6.4 Minutes of the 4th meeting

Date: Wednesday, 19 Apr 2017

Time: 4:00pm

Place: Room 3512

Attending: Prof. Rossiter, Jørgen Duley, Benson Ng

Absent: None

Recorder: Jørgen Duley, Benson Ng

Approval of minutes

The minutes of the last meeting were approved without amendment.

Report on Progress

Reached the national final in the Microsoft Imagine Cup 2017. Great progress on the app on all aspects. Memorystream issues on Android platform on certain devices. Issues in push notification and visual elements in chat on both devices. Experimental multi-text chat has been successfully implemented, but not deployed.

Discussion Items and Things to Do

Prepared presentation to use in the Microsoft Imagine Cup 2017 National Final. Received valuable continuous feedback used to improve the presentation as well as aspects of the app.

Meeting adjournment

The meeting was adjourned at 6:00pm

7. References

<https://compete.imagine.microsoft.com/en-us/team/117018>
<https://developer.xamarin.com/guides/xamarin-forms/application-fundamentals/navigation/carousel-page/>
<https://developer.xamarin.com/api/type/Xamarin.Forms.ContentPage/>
<https://developer.xamarin.com/guides/xamarin-forms/user-interface/layouts/scroll-view/>
<https://developer.xamarin.com/guides/xamarin-forms/user-interface/listview/>
<https://developer.xamarin.com/guides/xamarin-forms/application-fundamentals/custom-renderer/>
<https://github.com/luberda-molinet/FFImageLoading>
<https://github.com/aritchie/deviceinfo>
<https://github.com/daniel-luberda/DLToolkit.Forms.Controls/tree/master/FlowLayoutView>
<https://www.xamarin.com/>
<https://azure.microsoft.com/en-gb/>
<https://www.microsoft.com/net/>
<https://www.microsoft.com/net/core>
https://en.wikipedia.org/wiki/Hamming_distance
<https://www.sketchapp.com/>
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<http://www.newtonsoft.com/json>