

Improving Android Applications Based On Conference Navigator 3

Independent Study Report INFSCI 2950

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I. Introduction

This report is introducing what we have done and improved. The first part is a brief introduction of CN3, goals and techniques that being used through developing process. The second part is talking about the improvement of our Android App. In our version, we have made it as a template for future work. Other people can simply modify it just change the conference ID and the conference date and it will works for other conferences. But even if we improve some functions, there are still limitations and drawbacks which needs other people to solve.

1) CONFERENCE NAVIGATOR 3 (CN3)

Conference Navigator website is a personal conference-scheduling tool. Based on features of CN3, users can review conference information like available interesting conference program and proceedings, and then make personal settings, such as mark a paper and add a session to attend. What's more, the author list and their information can also be reached in CN. One of the wonderful functions is that people who have signed in can add a session they like easily into their own schedule and manage them conveniently. Conference Navigator's main aim is to enhance users experience at conferences.

Since the Android application based on Conference Navigator is mainly designed for the specific users preparing to attend conferences. Considering about functions, it contains schedule, presented papers, workshops, keynotes and also sign in, which covers most functions in CN website.

2) Goals

Although the previous versions of Android App had been improved many times, the last version still has some problems. For example, when people install this App at first time, it cannot update the information of conference automatically. Moreover, when the data in database had been updated, the App cannot remind people that there are some changes in the database until people try to click the update button. In our version, we have achieved the above two goals. Besides, the last version still has some bugs and some defective functions and we have fixed these.

Moreover, our version can work as a template for new conferences because Other people can simply modify it just change the conference ID and the conference date and it will works for other conferences.

3) Technical details

Development Environment and Techniques:

1. Android 4.2 APIs
2. SQLiteDatabase
3. Android Studio

Emulation environment:

For initial simulation: Android Virtual Device (AVD) by Android SDK

For real emulation: ASUS Google Tablet NEXUS 7 and Samsung Galaxy 4

Source link:

conference navigator 3:

<http://halley.exp.sis.pitt.edu/cn3>

source code:

<https://github.com/HugoZhang33/HT2015>

II. Implementation

a) Fix bugs remain in previous version:

We continued to improve the Android application based on the old version of Hypertext 2014. After some tests, we found some bugs exist. Most of them were related to the UI interactive behaviours, and some belong to parsing XML data from the backend APIs and local database issue.

In this report, we discussed one bug existed in the parsing XML data part.

At first, We found a strange bug: some papers' content were uncompleted, but most of papers' content were intact. The reason probably existed in the parsing XML data part. After several tests and code review, we found the problem: It used XMLReader to parse XML data in a wrong way. Different types of XML format need different customized ContentHandlers. In the customized ContentHandler, every time dealing with a tag, we need to append the data, not just get the data. Figure 0 is the code example for user schedule ContentHandler.

```

private class UserScheduleParseHandler extends DefaultHandler {
    private String paperID;
    private StringBuilder sb = new StringBuilder();

    public void startDocument() throws SAXException {
    }

    public void endDocument() throws SAXException {
    }

    public void startElement(String namespaceURI, String localName,
        String qName, Attributes atts) throws SAXException {
        sb.setLength(0);
    }

    public void endElement(String namespaceURI, String localName,
        String qName) throws SAXException {
        if (localName.equals("paperID")) {
            paperID = sb.toString();
            pidList.add(paperID);
            return;
        }
    }

    public void characters(char ch[], int start, int length) { sb.append(ch, start, length); }
}

```

Fig0. Code example

b) Work as a template for new conferences:

In order to speed up creating a new app for a new conference, we decided to refactor the code and integrate all parts as app template after we fixed bugs found in the previous version. First of all, we modified the structure of the project in the MVC way, in which there are three modules: activity, data and util.

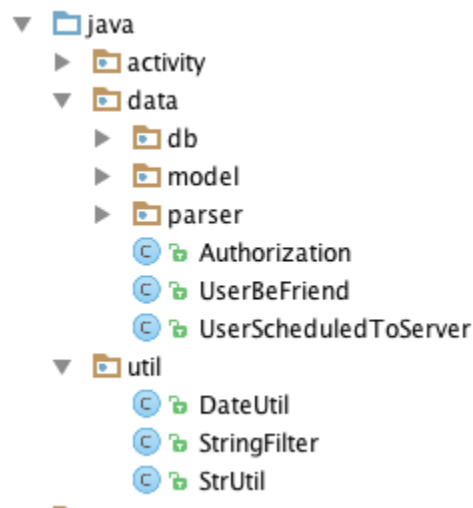


Fig1. Structure of project

Activity: This module contains all UI controllers. Every time creating a new interface, we should new a UI controller in here to handle the data needed for this interface.

Data: This module is the most complicated and important part in this Android application. It takes the responsibility to retrieve, parse and store all conference data from the backend APIs. There are three sub-modules in the Data module, db, model and parser. Module db is responsible for checking update from remote database and storing data in local database. Module model contains all data template classes, like session class, paper class, friend class, etc. Module parser is responsible for retrieving and parsing XML data.

Util: This module contains useful classes for development. Like DateUtil, it is in charge of translating Date format.

After the integration, for each new conference, we only need to do three jobs:

- 1, modify the conference configuration in model/Conference (shown in figure 2)
- 2, modify the date configuration in util/DateUtil (shown in figure 3)
- 3, replace new backgrounds and app icon

```
package data.model;

public final class Conference {

    public static String id = "134";
    public static String title = "";

    public static String startDate = "";
    public static String endDate = "";
    public static int days=5;
    public static String location = "";

    public static String description = "";

    public static boolean userSignin = false;
    public static String userID = "";
    public static String timestamp = "2015-06-01 00:00:00.0";

    public static String twitter_item = "";
    public static String twitter_item_active = "";
    public static String twitter_widget_id = "";
    public static String twitter_handler = "";
    public static String twitter_hashtag = "";

    public static String homepage = "";
}
```

Fig2. Conference configuration

```

package util;

import java.util.Hashtable;

/**
 * Created by hongzhang on 8/24/15.
 */
public class DateUtil {
    public static Hashtable<String, String> Datetrans;
    public static Hashtable<String, String> Dtrans;

    static {
        Datetrans = new Hashtable<String, String>();
        Datetrans.put("2015-06-29", "Monday, Jun.29");
        Datetrans.put("2015-06-30", "Tuesday, Jun.30");
        Datetrans.put("2015-07-01", "Wednesday, July.1");
        Datetrans.put("2015-07-02", "Thursday, July.2");
        Datetrans.put("2015-07-03", "Friday, July.3");

        Dtrans = new Hashtable<String, String>();
        Dtrans.put("2015-06-29", "1");
        Dtrans.put("2015-06-30", "2");
        Dtrans.put("2015-07-01", "3");
        Dtrans.put("2015-07-02", "4");
        Dtrans.put("2015-07-03", "5");
    }
}

```

Fig3. Date configuration

c) New features and interfaces:

Based on the previous version, we had added few new features and interfaces to improve user interaction experience and strengthen application's functions.

New Features:

1, Auto loading data at the first time using this application.

In the previous version, user need to click the update button to load conference data by themselves at the first time using this application, which is not user-friendly interactive design. So we finished a new feature auto loading conference data at first launch and created a new interface in which showing process information to user.

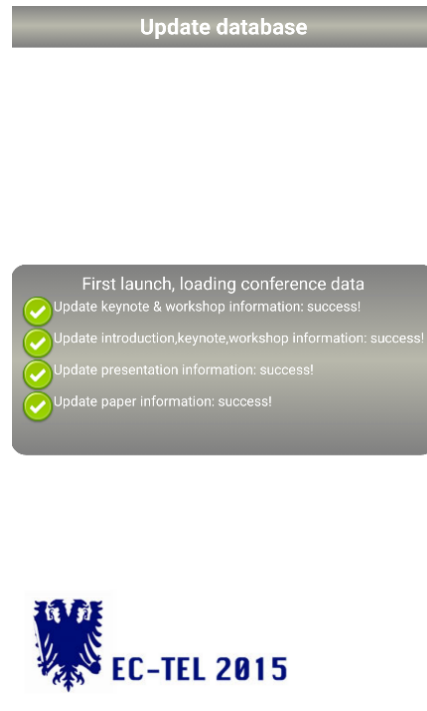


Fig4. Auto loading at first launch

2, Red exclamation mark reminding user to update conference data.

In previous version, no reminding behaviour tells user to update conference data. They have to click the update button to check update information by themselves. So we add a new feature which can check update in the background and show a red exclamation mark above the update button to remind user to update conference data if needed.

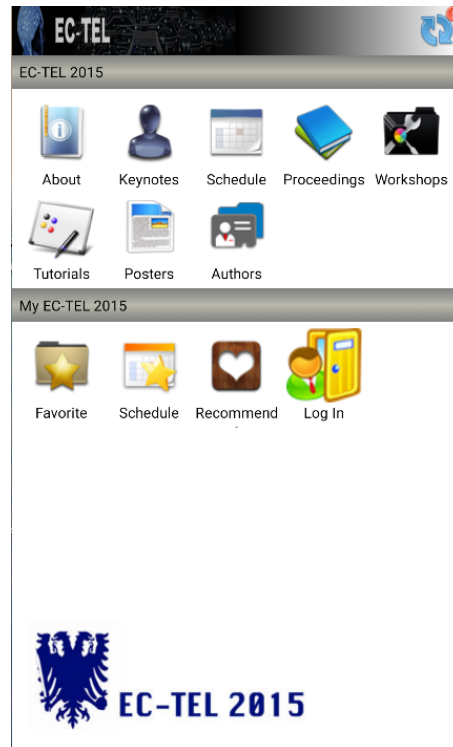


Fig5. Reminding user to update data

3, Changing date by slide gesture

In the old version, each time user want to see conference information in the other day, they need to click the date tap which is on the top of the application. We considered this interaction behaviour as an inconvenient operation. So we designed a slide gesture helping user to changing date which allows user to change date in anywhere of the application screen.

New Functions:

1, Authors

In this function, people can see the authors of all the papers. Moreover, when one person want to see all the papers that has one specific author, he/she can click the name of this author.

2, Tutorials and Posters

In these two functions, people can read the paper which type is tutorial or poster. It can help people more convenient to choose the paper they want to read.

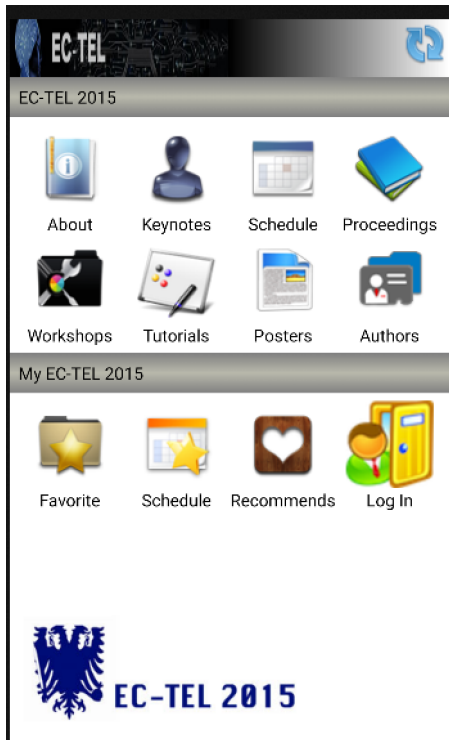


Fig6. Homepage

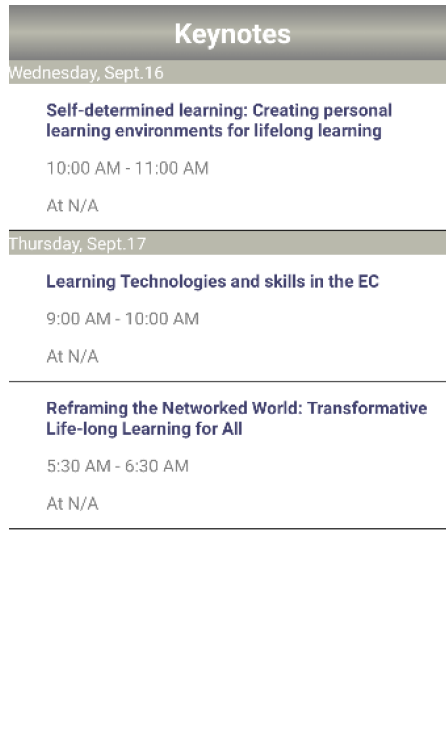


Fig7. Keynote

Tue, Sept. 15	Wed, Sept. 16	Thu, Sept. 17	Fri, Sept. 18
9:00 AM - 9:30 AM			
Registration			
9:30 AM - 10:00 AM			
Opening			
10:00 AM - 11:00 AM			
Keynote Speaker 1: Lisa Marie Blaschke			
11:00 AM - 11:30 AM			
Coffee Break			
11:30 AM - 1:00 PM			
Session 1A: Learning Design & Orchestration			
Session 1B: Learning in Communities			
Session 1C: Intelligent Systems & User Interfaces			
1:00 PM - 2:30 PM			
Lunch			
2:30 PM - 3:30 PM			
Demo Shootout			
3:30 PM - 5:00 PM			

Fig8. Schedule

Authors	
A	
Abelardo Pardo-Sanchez	A
	B
Agnes Kukulska-Hulme	C
	D
Alain Mille	E
	F
Alan Smeaton	G
	H
Alfons Juan	I
	J
Alfred Essa	K
	L
Alison J Cooper	M
	N
Alvaro Figueira	O
	P
Amy Woodgate	Q
	R
Andrea Di Ferdinando	S
	T
Andreas Breiter	U
	V
Andri Ioannou	W
	X
	Y
	Z
Anna Tate	

Fig9. Author

Author	Title	Type
	Predicting Results from Interaction Patterns during Online Group Work	A
	Thursday, Sept.17 5:15 PM - 5:30 PM	B
★	Alvaro Figueira,	C
	Short Paper	D
		E
		F
		G
	Towards Hyper Activity Books for Children, Connecting Activity Books and Montessori-like Educational Materials	J
	Thursday, Sept.17 3:37 PM - 4:00 PM	K
★	Andrea Di Ferdinando, Raffaele Di Fuccio, L	L
	Michela Ponticorvo, Orazio Miglino,	M
	Short Paper	N
		O
		P
	Potentials of Gamification in Learning Management Systems: A Qualitative Evaluation	Q
	Wednesday, Sept.16 6:00 PM - 6:15 PM	R
★	Andreas Breiter, Jan Broer,	S
	Short Paper	T
		U
		V
		W
	Learners? attitudes toward using wikis and forums for collaboration on case problems	X
		Y

Fig10. Proceeding

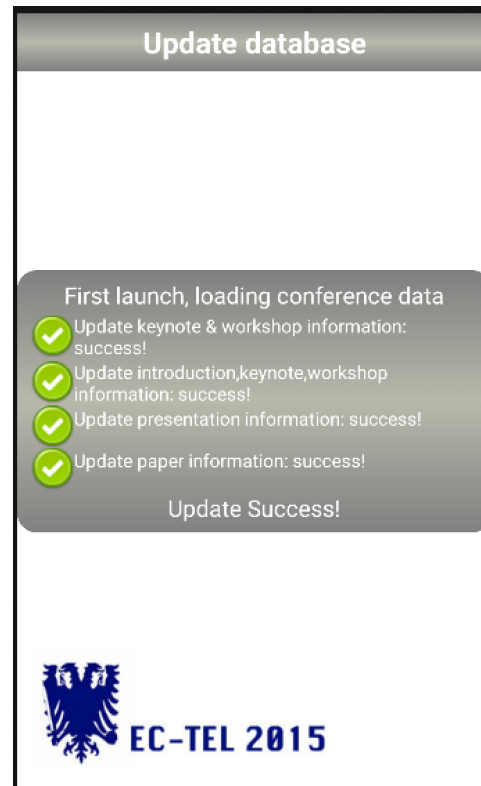


Fig11. Update

III. Conclusion and future work

In this project, we have improved some new functions like update information automatically when people first install this App, the remind of new data changes, a new function called “Authors” that people can see the list of authors included all the papers in this conference and a “Tutorials” and a “Posters” that people can see the paper that the type is tutorial and the type is poster respectively. What’s more, we designed a slide function that people can slide in the screen from right to left or from left to right to see the information of next day or the previous day. And we also have fixed many bugs.

From this project experience, we learned not only things about how to develop and test android applications, also how to build stable architecture and to improve coding skills.

In this version, it just can be used for one conference. In the future version, users can read different information of different conference in one application. Thus, we should

design one new page to list all the conferences in which users can select the conference they want to see. After user choose, this application will load the related information.

Besides, we should refactor the source code and optimize some functions in our project because some functions are overlap or not useful.