

Find Me: A Mobile Application for Locating Misplaced Smartphones

A Thesis Presented to
the Faculty of College of Computer Studies
Lyceum of the Philippines
University – Batangas City

In Partial Fulfilment
of the Requirements for the Degree
Bachelor of Science in Computer Science
(Specialized in Mobile Application Development)

by:

Neil Jonathan D. Borbon
John Carlo B. Cabrera
Francisco Jego C. Joaquin
John Paul S. Parzuelo

March 2017

APPROVAL SHEET

In partial fulfilment of the requirements for the degree Bachelor of Science in Computer Science, this thesis titled, **“Find Me: A Mobile Application for Locating Misplaced Smartphones”** has been prepared and submitted by Neil Jonathan D. Borbon, John Carlo B. Cabrera, Francisco Jago C. Joaquin, and John Paul S. Parzuelo and is hereby recommended for oral examination.

Mrs. Roselie B. Alday, MCS
Adviser

Defended in an oral examination before a duly constituted panel with a grade of _____.

Mrs. Maria Cristina M. Ramos, MSCS
Ebreo

Chairman

Mr. Von Derick G.

Member

Ms. Recalyn M. Manalo
Grammarian

Accepted in partial fulfilment of the requirements for the degree Bachelor of Science in Computer Science.

Mrs. Roselie B. Alday, MCS
Dean, College of Computer Studies

Acknowledgement

The researchers would first like to give glory to the Almighty God for giving them the strength and wisdom to carry out this study. The researchers would also like to express their sincerest and heartfelt gratitude and appreciation to all people who had contributed much to this study, especially Sir Jedjie Joaquin who supervised and helped them with the development of the app.

The researchers would also like to give thanks to Lyceum of the Philippines University - Batangas, for providing quality and excellent education; to their Dean, Dr. Roselie B. Alday, for her continuous support and encouragement; To their panelists, Mrs. Maria Cristina M. Ramos and Mr. Von Derick G. Ebreo for their constructive criticism and suggestions for the improvement of this study during the pre-oral defense; To their grammarian Ms. Recalyn Manalo. To the librarians of Lyceum of the Philippines University – Batangas for granting the researchers the permissions to gather reference which were essential in the preparation of this study; To BSCS IV-A, friends, and classmates for their moral support and encouragement; To their family for the prayers, inspirations, and financial, moral spiritual support.

Neil Jonathan D. Borbon

John Carlo B. Cabrera

Francisco Jego C. Joaquin

John Paul S. Parzuelo

Dedication

The Researchers would like to dedicate this to their families for supporting them throughout the study. They would also like to dedicate to their friends and classmates for their moral support and for all their help. The researchers will always appreciate all the things they've done.

Neil Jonathan D. Borbon

John Carlo B. Cabrera

Francisco Jego C. Joaquin

John Paul S. Parzuelo

Table of Contents

Title Page.....	i
Approval Sheet.....	ii
Acknowledgement.....	iii
Dedication.....	iv
Table of Contents.....	v
List of Figures.....	vi
Abstract	1
1.0 Introduction.....	1
2.0 Review of Literature.....	2
2.1 How is Speech Recognition used in an application?	2
2.1.1 PC Based Application.....	2
2.2 What applications are used in finding devices?	2
2.3 What makes this app different?	3
2.4 How will the application work?	3
2.5 How will the algorithm be used?	4
2.6 Methods.....	4
2.7 What is Speech Recognition?	5
2.7.1 Speech Recognition vs Voice Recognition	5
3.0 Results and Discussion	5
4.0 Conclusion	6
5.0 Recommendation	6
References	7
Appendices.....	8

A. Screenshots	8
B. Codes	

List of Tables and Figures

Type	Name	Page
Figure	1.0 Application Process Flowchart.....	4
Figure	2.0 Speech Recognition Diagram.....	5
Figure	3.0 Splash Screen.....	8
Figure	4.0 Main Screen.....	8
Figure	5.0 List of Words.....	8
Figure	6.0 List of Alarm Sounds.....	8
Figure	7.0 Main Screen when activated.....	9
Figure	8.0 Notification Window.....	9
Figure	9.0 About us.....	9

Table 1.0 Result of Testing.....	6
Table 2.0 Compatibility Table.....	6

Find Me: A Mobile Application for Locating Misplaced Smartphones

Neil Jonathan D. Borbon
Lyceum of the Philippines
University Batangas
Capitol Site, Batangas City
neilborbon.ccs@gmail.com
ORCID: 0000-0002-7626-8906

John Carlo B. Cabrera
Lyceum of the Philippines
University Batangas
Capitol Site, Batangas City
carlocaabrera.ccs@gmail.com
ORCID: 0000-0003-0034-5319

John Paul S. Parzuelo
Lyceum of the Philippines
University Batangas
Capitol Site, Batangas City
jpparzuelo.ccs@gmail.com
ORCID: 0000-0002-9941-1699

Francisco Jego C. Joaquin
Lyceum of the Philippines
University Batangas
Voice | Capitol Site, Batangas City
jegojoaquin.ccs@gmail.com
ORCID: 0000-0001-5129-7869

Abstract

FindMe is a mobile application developed using Speech Recognition Algorithm to locate a misplaced smartphone by saying an inputted word to trigger the alert function of the app. The application allows the user to choose from a set of words as the input word to locate a misplaced smartphone, after doing so, the user must also select from a set of alarm sounds. Once all inputs are done, the user is to tap the start button and go to the notification pane and click the start button to start the recognition process of the app. Once the word is said and the app recognizes the word as the inputted word from the app, the app will trigger the alert sound and make the flashlight go on and off until the user taps the stop button from the notification pane.

Keywords: Android, Java, Mobile Application, Speech Recognition,

1.0 Introduction

In today's world, smartphones have become an essential part of our everyday lives, however humans are flawed in that they sometimes misplace their important belongings. This usually results in wasting time that could be better spent on more productive activities. That is why the authors have chosen to develop this application, they want to mitigate these potential problems.

This app is able to locate your phone if your phone was misplaced just near you. Through the use of this application, users can find their mobile device by saying a user-selected word which is picked up by the devices microphone, causing the phone to emit a sound and turn on the flashlight so it will be easier for the user to find it even on a dark room

1.1 Objectives

1. To develop an app that will help users to find their smartphone if they lose it.
2. To create a mobile application that will make use of Speech Recognition
3. To make an application using Java Programming Language in the development.

2.0 Review of Literature

The researchers made use of different references with regards to locating a smartphone.

2.1 How is Speech Recognition used in an application?

Speech recognition the one responsible for the conversion of the speech signal to text for this text to be tested on a decision statement to check if it is the same as the inputted word on the application.

2.1.1 PC Based Application

According to O'Neill(2013), Google has that feature wherein you can search things on the internet by telling google what to search. This is only possible for PC's with a built in microphone, otherwise the users will have to buy a headset with a microphone to be able to use this feature

2.1.2 Mobile Based Application

One example of a mobile based application is Google Now. Google now is a built in app for android wherein you just have to say "Okay Google". This allows you to command

your phone to do something by telling it what to do, be it texting or calling a friend, writing a note, saving contact and several others. Although Google Now is very helpful, unfortunately this is only compatible for devices with Android 4.1 (Jellybean) Version and up.

For iOS, it also has its own built-in app called Siri. Siri is a personal assistant for iOS devices. Just like Google Now, Siri also allows you to command your phone to do something. Siri can only be used by people with iPhone 4s and up, iPod Touch 5th Generation and up, iPad 3rd Generation and up, iPad Pro, Apple Watch and Apple TV.

2.2 What applications are used in finding devices?

In the Play Store, there are other apps used in finding your device. Each has its own way on doing so. Let us start with those apps that makes use of GPS which has a bigger scope. In the apps that make use of GPS (Global Positioning System) it locates your phone by showing on the GPS where it is. One example of this kind of app is "Find My Lost Phone" which was developed by Family Safety Productions.

Another app is finding your phone through whistling. In this type of phone finding app, it is rather hard because we all know that not all people can whistle and what if a person just near you whistles and the app is running, then the phone will alert at that moment. One more problem with the app that finds phone

through whistle is that whistles are not that loud, unless you can do that whistle where you put fingers in your mouth and make a loud one, but just like what was said earlier not all people can do it especially whistling with fingers in your mouth. One example of this kind of phone finding app is “Whistle and Find – Phone Finder” by Blenny App.

The last one was finding a phone through clapping. Compared to other apps, this is very sensitive because clapping is somewhat common wherever you go. So your phone is going to alert every time a person near your phone claps. An example of this is an app, developed by Frimus named “Clap to find”.

2.3 What makes this app different?

This app requires the user to say a specific name that the user inputs to alert the phone. By doing this you can control the loudness or softness on how you will say it unlike the app that finds phone through a whistle. It will not trigger easily because the word will be unique unlike clapping, almost every day you see someone clapping. The researchers want this app to be helpful to users so they are doing their best to make this app as accurate as possible.

2.4 How will the application work?

The user is to choose the word to be said and the alarm sound. After doing so, the user must tap the activate button and go to the notification window to start the foreground service. Then when the

user wants to locate it, he/she just have to say the inputted word.

Then after doing all of these, the user can now close the app and when the phone gets lost he/she just have to say the name inputted and the phone will ring as the name is said. The user can now stop the alert with a button once the phone is located.

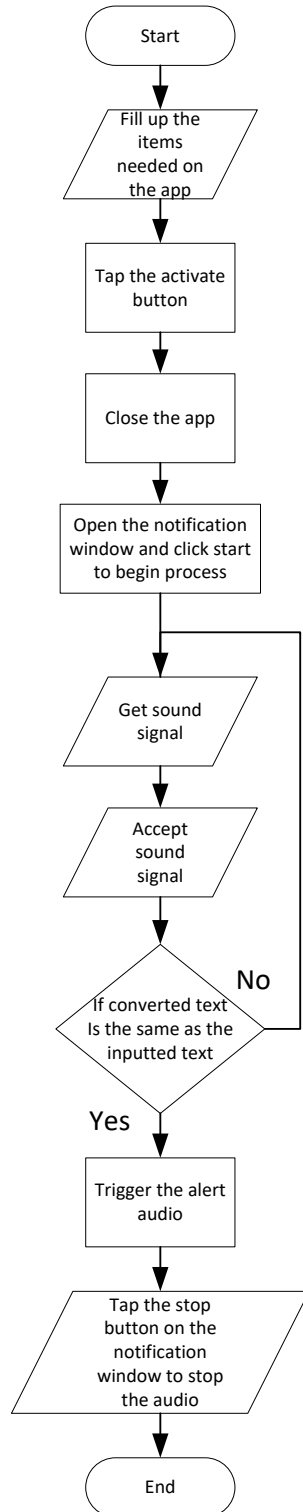


Figure 1. Application Process Flowchart

2.5 How will the algorithm be used?

When the phone receives the voice signals the algorithm will be responsible for converting it to text for the program to assess and be applied to a decision statement wherein there will be codes for confirmation if that word is the word which triggers the phone to alert.

2.6 Methods

The proponents used Java Programming Language on this project. Why Java? First of all, they used Android Studio in developing this app, Android Studio is a software wherein you can create a mobile application. Everything done on Android Studio is Java based, that is why they used Java Programming Language. Java is the programming language which is the easiest to understand.

According to Channing (2013), Java has a very simple grammar familiar to anyone with experience in C and C++, which must be 99.9% of programmers. These days, Java really does run well on all popular platforms. In Java you can happily write your code knowing that the standard java.* libraries will be waiting on the client for it, assuming a recent enough version of java is installed. In terms of garbage collection, the programmer does not have to worry about memory most of the time. In Java it is relatively easy to make programs that parse or produce classified.

According to Rouse (2007),

Java is a programming language expressly designed for use in the distributed environment of the Internet. It was designed to have the "look and feel" of the C++ language, but it is simpler to use than C++ and enforces an object-oriented programming model. Java can be used to create complete applications that may run on a single computer or be distributed among servers and clients in a network.

2.7 What is Speech Recognition?

According to Rouse (2007), Speech recognition is the ability of a machine or program to identify words and phrases in spoken language and convert them to a machine-readable format.

Based from Christensson's article (2014), a microphone records a person's voice and the hardware converts the signal from analog sound waves to digital audio. The audio data is then processed by software, which interprets the sound as individual words. A common type of speech recognition is "speech-to-text" or "dictation" software, such as Dragon Naturally Speaking, which outputs text as you speak. While you can buy speech recognition programs, modern versions of the Macintosh and Windows operating systems include a built-in dictation feature. This capability allows you to record text as well as perform basic system commands.

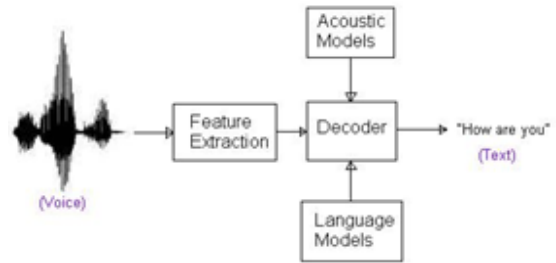


Figure 2. Speech Recognition Diagram

2.7.1 Speech Recognition vs Voice Recognition

People should not be confused with voice recognition which is used mainly in security devices. It's easy to confuse voice recognition with speech recognition. Both use recordings of the human voice, but they do different things with it. Speech recognition strips out the personal differences to detect the words. Voice recognition typically disregards the language and meaning to detect the physical person behind the speech. Speech recognition is language dependent, while voice recognition is independent of language. In essence, voice biometrics provides speaker recognition rather than speech recognition. So basically, Speech Recognition is knowing what word is said, and Voice recognition is knowing who said something by recognizing the voice of a particular person.

3.0 Results and Discussion

The researchers tested the accuracy of the application and Speech Recognition Algorithm by calling out the inputted word within 10

feet. They did 10 tries every 1 feet. The result of the testing are as follows:

Distance	Remarks
1ft	7 out of 10
2ft	8 out of 10
3ft	6 out of 10
4ft	5 out of 10
5ft	4 out of 10
6ft	2 out of 10
7ft	2 out of 10
8ft	3 out of 10
9ft	5 out of 10
10ft	2 out of 10

Table 1.0 Result of Testing

As seen in the table above, it is easy to say that distance affects the accuracy of the application, consistency still depends on the distance of the phone from the user. Another problem is the accent of the user. The user must say the word clearly for the app to recognize it as the inputted word.

DEVICE	REMARKS
Samsung S7 Edge	Compatible
Samsung S7	Compatible
Samsung S3	Compatible
Sony Xperia M	Compatible
Sony Xperia C3	Compatible
HTC One M8	Compatible

Firefly R90	Not compatible
-------------	----------------

Table 2.0 Compatibility Table

When it comes to device compatibility, accuracy depends on the phone's microphone and its ability to accept sound inputs. The authors tried the application on different devices and they discovered that the application is hardware dependent because if the device's microphone is of poor quality the application won't perform as good as you expect it would be.

4.0 Conclusion

Based from the overall assessment of the application, the researchers can conclude that the application's accuracy will depend on 3 things: distance, accent, and hardware.

These factors contributes a lot on whether the app will be accurate or not. Distance can alter the effectiveness of the application. It will depend on how loud your voice is. Accent is the main thing that hinders the accuracy of the app because if you can't say the word with the correct pronunciation the app won't work. The last one is hardware, if a device's microphone is not that good the application won't work properly.

5.0 Recommendation

The researchers recommend that further research and development be done to improve the accuracy of the application and to enhance its current set of features. This includes improvement or amplification of the

recognition of sound input of the application. They would also like to recommend that the user may be able to access his/her list of songs in the phone for the alert sound.

References

[1]Cassavoy, L. (2011). Best Voice Recognition Apps for your Smartphone. Retrieved from http://www.pcworld.com/article/235848/best_voice_recognition_apps_for_your_smartphone.html

[2]Channing W. (2013). Why Java is Great. Retrieved from <http://c2.com/cgi/wiki?WhyJavalsGreat>

[3]Christensson, P. (2014, January 10). Speech Recognition Definition. Retrieved 2016, Jun 13, from <http://techterms.com>

[4]O'Neill M. (2013). Control your PC with these 5 speech recognition programs. Retrieved from <http://www.pcworld.com/article/2055599/control-your-pc-with-these-5-speech-recognition-programs.html>

[5]Rouse, M. (2007). Speech Recognition. Retrieved from <http://searchcrm.techtarget.com/definition/speech-recognition>

Appendices

A. Screenshots

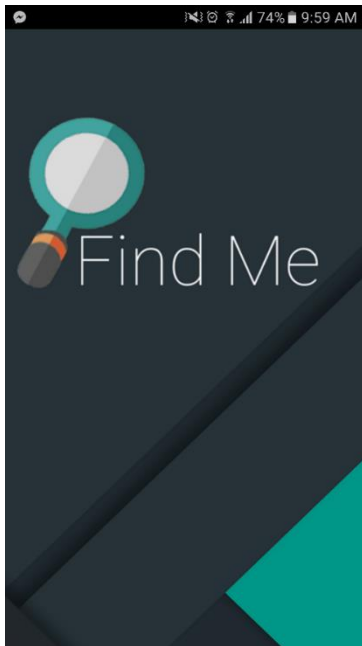


Figure 3. Splash Screen

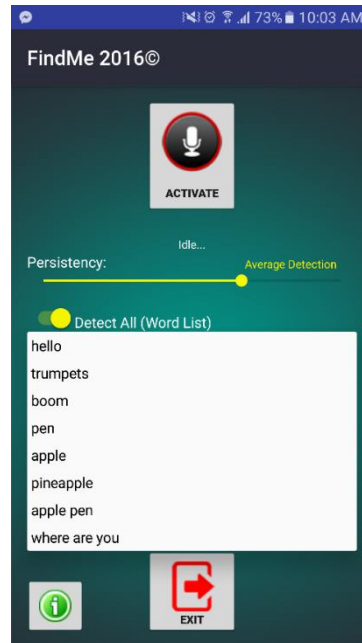


Figure 5. List of words

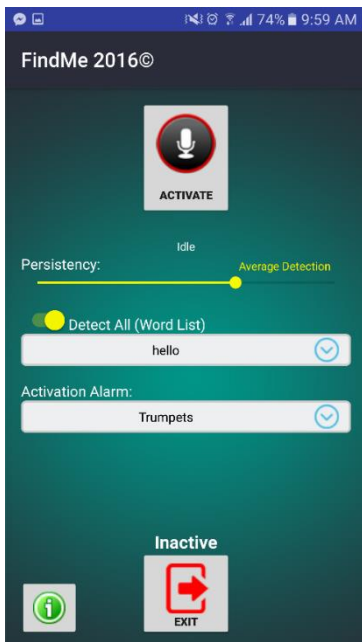


Figure 4. Main Screen

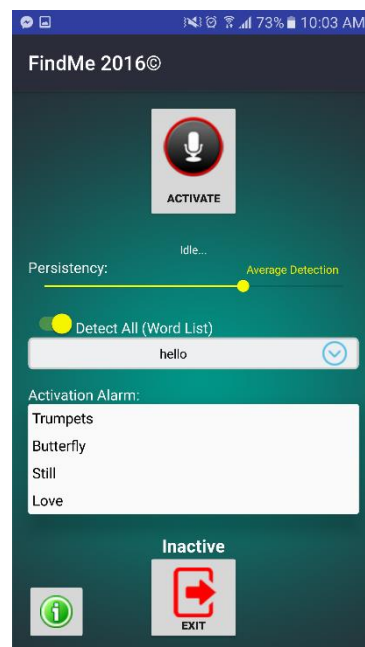


Figure 6. List of alarm sound

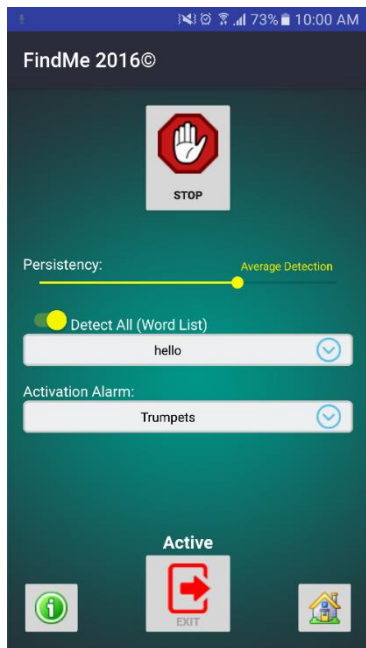


Figure 7. Main Screen when Activated

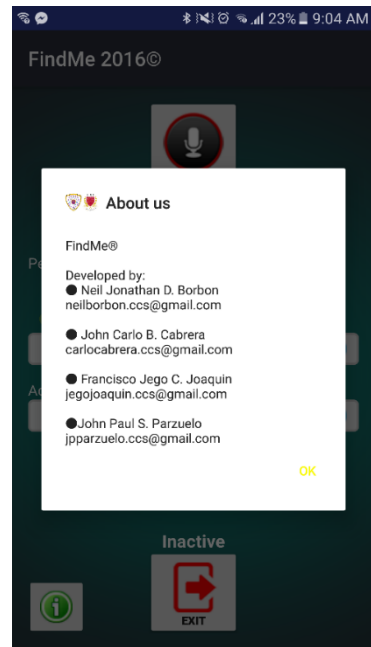


Figure 9. About us

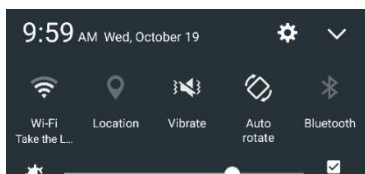
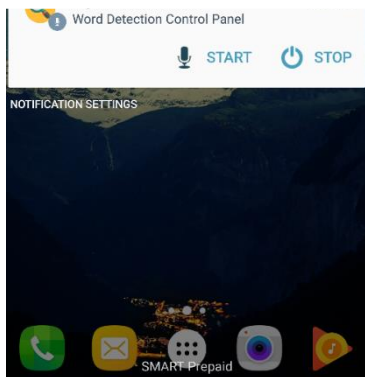


Figure 8. Notification Window



CURRICULUM VITAE

Name: Neil Jonathan D. Borbon
Address: Alangilan, Batangas City
Course: Bachelor of Science in Computer Studies



PERSONAL DATA

Nickname: Neil
Birthdate: July 16, 1996
Age: 20
Gender: Male
Status: Single
Nationality: Filipino
Contact Number: 09491486006
Email Address: neilborbon.ccs@gmail.com

FAMILY BACKGROUND

Father: Nello A. Borbon Contact Number: 09998818368
Occupation: Mechanical Inspector
Mother: Jovita D. Borbon Contact Number: 09998818369
Occupation: Chef / Businesswoman

ACADEMIC BACKGROUND

Primary: St. Bridget College - Batangas
Secondary: St. Bridget College - Batangas
Tertiary: Lyceum of the Philippines University – Batangas

CURRICULUM VITAE

Name: John Carlo B. Cabrera
Address: Bihis, Taal Batangas
Course: Bachelor of Science in Computer Studies



PERSONAL DATA

Nickname: Carlo
Birthdate: April 29, 1997
Age: 19
Gender: Male
Status: Single
Nationality: Filipino
Contact Number: 09067444413
Email Address: carlocabrera.ccs@gmail.com

FAMILY BACKGROUND

Father: Bayani Cabrera Contact Number: 09365761511
Occupation: Businessman
Mother: Josephine Cabrera Contact Number: 09173851515
Occupation; Housewife

ACADEMIC BACKGROUND

Primary: Taal Central School
Secondary: Our Lady of Caysasay Academy
Tertiary: Lyceum of the Philippines University - Batangas

CURRICULUM VITAE

Name: Francisco Jego C. Joaquin
Address: Lealtad St. Balayan, Batangas
Course: Bachelor of Science in Computer Studies



PERSONAL DATA

Nickname: Jego
Birthdate: August 14, 1996
Age: 20
Gender: Male
Status: Single
Nationality: Filipino
Contact Number: 09278227126
Email Address: jegojoaquin.ccs@gmail.com

FAMILY BACKGROUND

Father: Francisco Jedjie Joaquin Contact Number: 09271508867
Occupation: Programmer
Mother: Ma. Miranda C. Joaquin Contact Number: 09272398887
Occupation: Teacher

ACADEMIC BACKGROUND

Primary: Immaculate Conception College
Secondary: Immaculate Conception College
Tertiary: Lyceum of the Philippines University – Batangas

CURRICULUM VITAE

Name: John Paul S. Parzuelo
Address: Brgy. Tumbaga Uno, Sariaya, Quezon
Course: Bachelor of Science in Computer Studies



PERSONAL DATA

Nickname: JP
Birthdate: June 15, 1997
Age: 19
Gender: Male
Status: Single
Nationality: Filipino
Contact Number: 09952712830
Email Address: jpaparzuelo.ccs@gmail.com

FAMILY BACKGROUND

Father: Alejandro Parzuelo Sr. Contact Number: 09097626090
Occupation: Mechanic
Mother: Apolonia Parzuelo Contact Number: 09165879376
Occupation: Dress Vendor

ACADEMIC BACKGROUND

Primary: Central Main Sariaya East Elementary School
Secondary: Sariaya Institute Inc.
Tertiary: Lyceum of the Philippines University – Batangas