

# CyBeacon

May1714

Client/Advisor: Jaeyoun Kim

Team Members:

- Ming Wu
- Xiayang Sun
- Chenliang Xu
- Xin Ying Loh
- Sam Jones

# Introduction

## Problem

- Cell phones and other devices are distracting when they ring or get notifications in a classroom setting.
- Not a good platform for professor to provide course material in the classroom

## Solution

- Create a smartphone application that will automatically silence the device when it enters a classroom.
- Utilize iBeacon Bluetooth Low Energy to achieve location based functionality.

## Goals

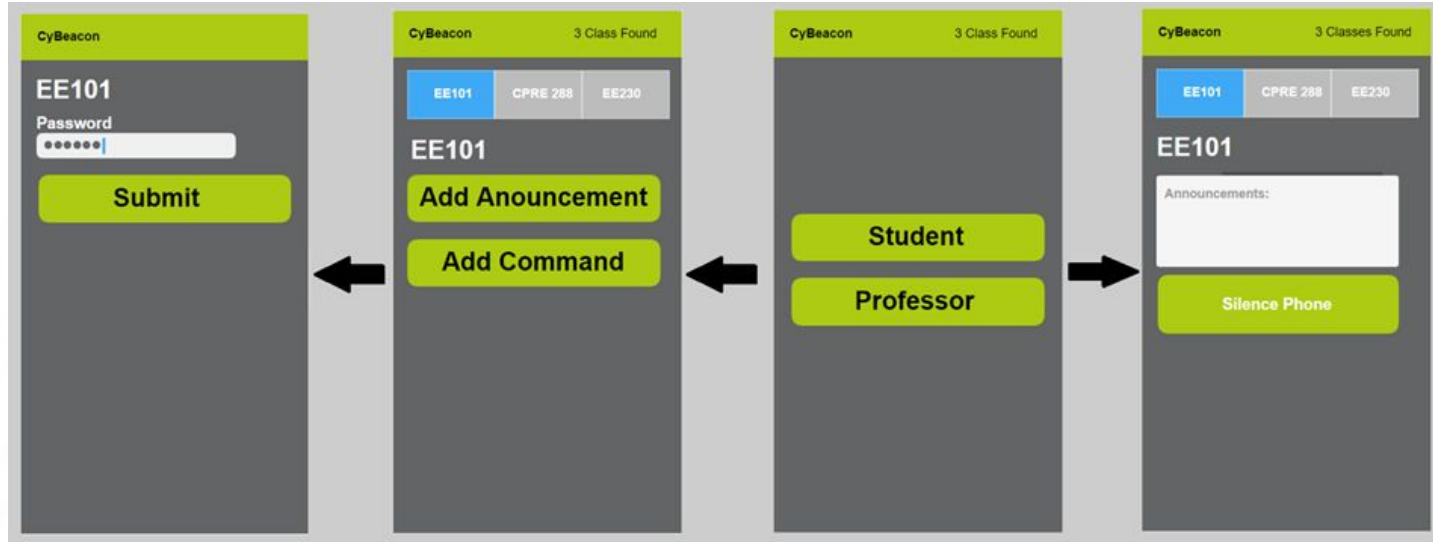
- Improve the educational environment inside the classroom.
- Provide a platform for professor to give students material when they attend lecture

# Project Status and Schedule

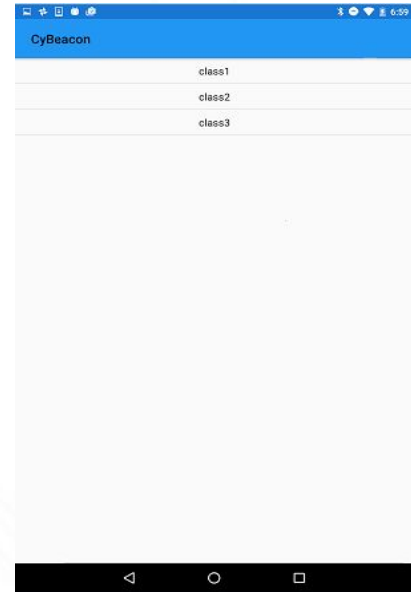
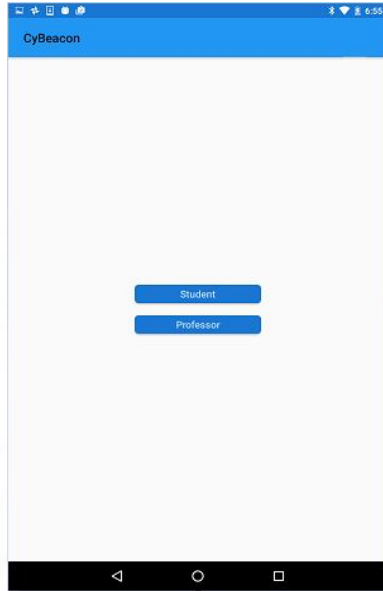
- Modified previous schedule
- Finalized project
- Finished all testing

Title:	iBeacon
Time	Event
24/10/2016	Get start
<b>31/10/2016</b>	<b>Learning iBeacon</b>
7/11/2016	Do deep research on iBeacon
<b>14/11/2016</b>	<b>Play with android studio</b>
21/11/2016	Learning UI design
<b>28/11/2016</b>	<b>Make final changes to UI</b>
5/12/2016	Connect android to iBeacon
<b>12/12/2016</b>	<b>Finish data transmission</b>
19/12/2016	First semester report
<b>9/1/2017</b>	<b>Test for transmission</b>
16/1/2017	Test iBeacon distance
<b>23/1/2017</b>	<b>Finish all sensitivy test</b>
30/1/2017	Working on first function:silence phone
<b>6/2/2017</b>	<b>Keep working first function</b>
13/2/2017	Test for first function
<b>20/2/2017</b>	<b>Start second function: announcement</b>
27/2/2017	Keep working second function
<b>6/3/2017</b>	<b>Test and debug for functions</b>

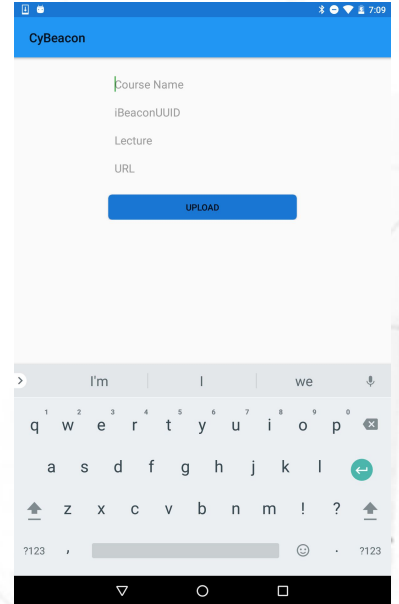
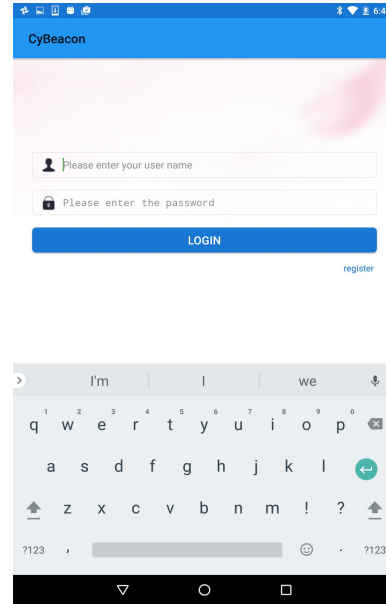
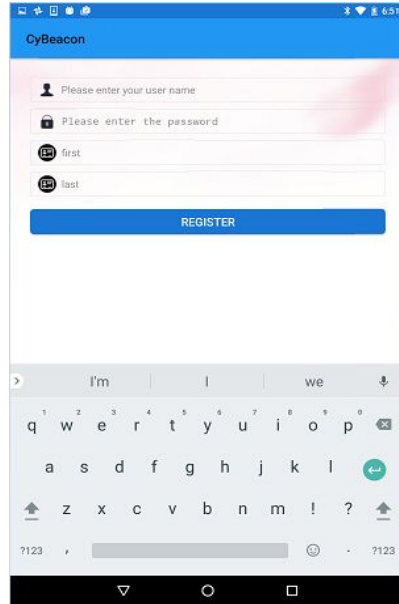
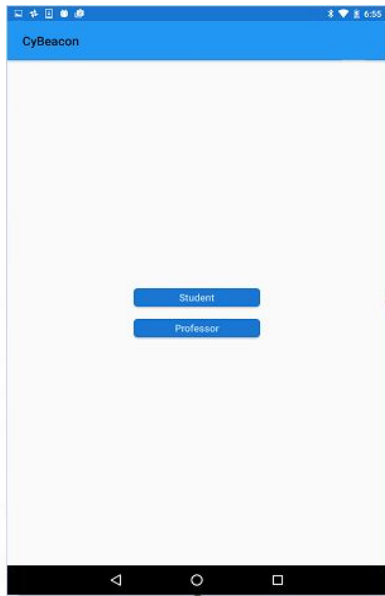
# Previous-UI Design



# UI Design-Student



# UI Design - Professor



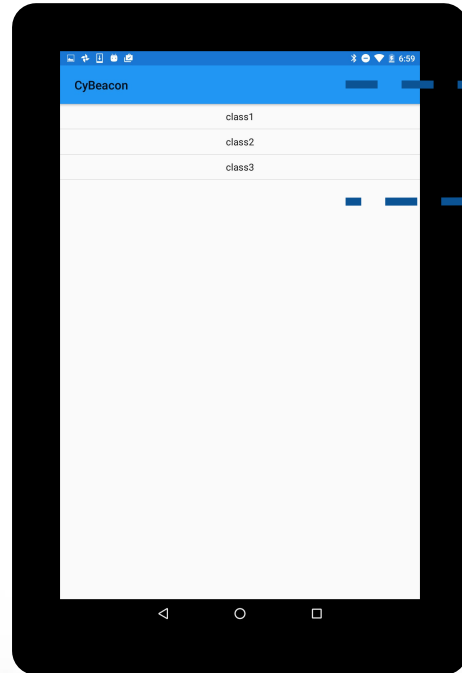
# Functions

## Automatic Silencing

- Purpose
  - Improve educational environment
- Implementation
  - Bluetooth functionality scans for iBeacon signal
  - Android clock system creates repeatedly scan
- Testing
  - “GemTotSDK” simulates iBeacon signal

# Functions

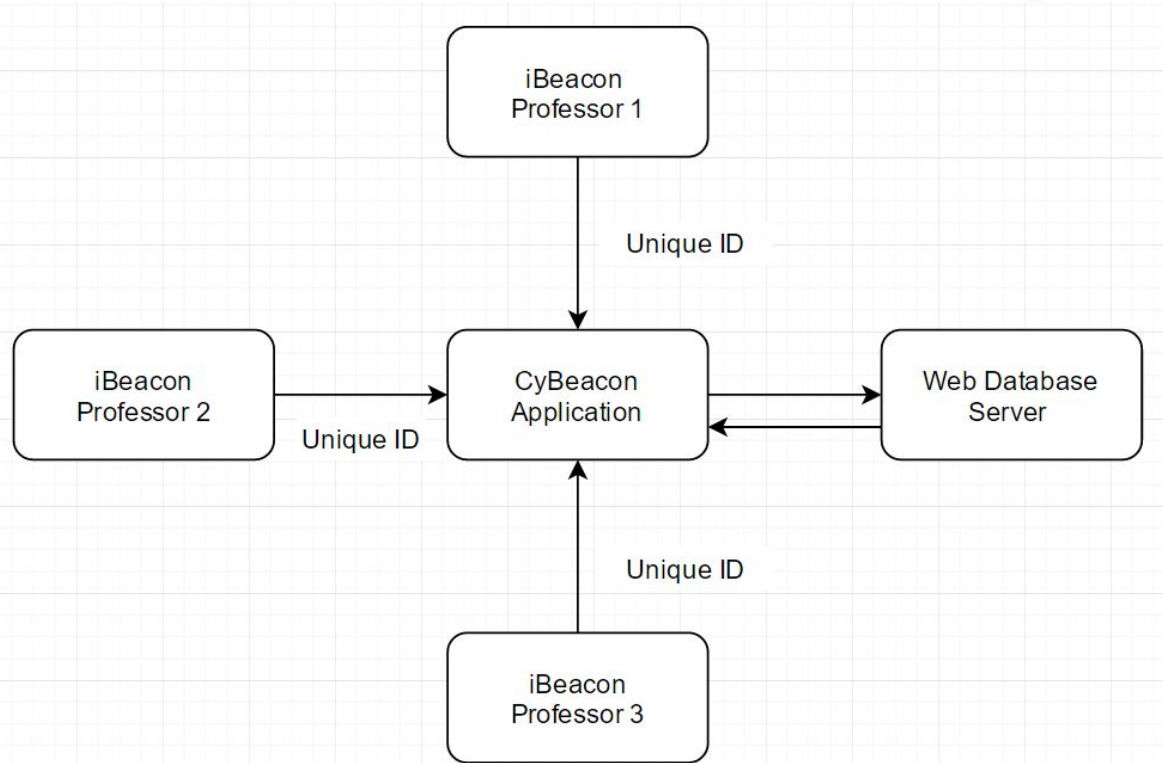
## Course Materials





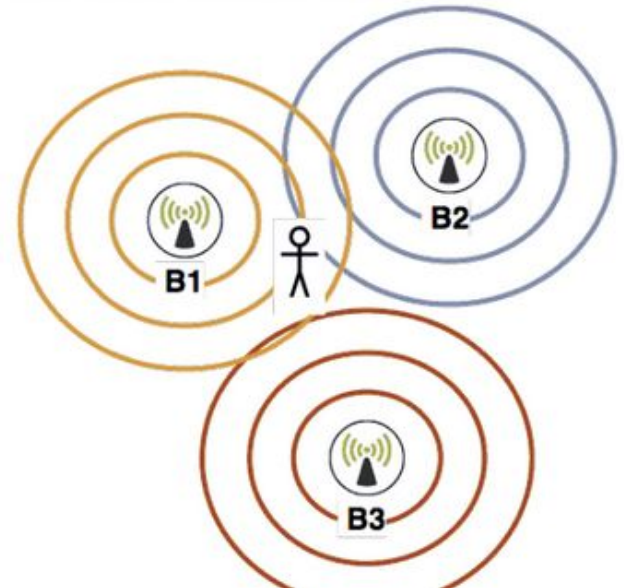
# Design: Communication

- Utilizes iBeacon Bluetooth Low Energy protocol
- Data (UUID) is sent in only one direction from iBeacon device to application.
- Application sends and receives data from the Database through an internet connection and PHP files.



# Hardware

- Social Retail
  - Poor documentation
  - Cost associated with services
- iPhone/Smartphone
  - Very user friendly.
  - Good for short term testing and debugging.
- RadBeacon
  - Adequate documentation and functionality.
  - Good long term solution.






























# Server/Database



























# Server/Database

- User info:

		ID	username	password	first	last	status
<input type="checkbox"/>	 Edit  Copy  Delete	1	xcl	123	Chenliang	Xu	0
<input type="checkbox"/>	 Edit  Copy  Delete	2	koh	123	Kohaku	Xu	1
<input type="checkbox"/>	 Edit  Copy  Delete	3	wmwm1212	123	Ming	Wu	0
<input type="checkbox"/>	 Edit  Copy  Delete	4	sunxy	123	Xiayang	Sun	0
<input type="checkbox"/>	 Edit  Copy  Delete	5	xy	123	Xin	Ying	0
<input type="checkbox"/>	 Edit  Copy  Delete	6	sj	123	Sam	Jones	0
<input type="checkbox"/>	 Edit  Copy  Delete	10	test123	123	aaa	bbb	0
<input type="checkbox"/>	 Edit  Copy  Delete	11	Leo	123	skxkdk	xkkcj	1
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<input type="checkbox"/>	 Edit  Copy  Delete	13	sam	123	sam	jones	1

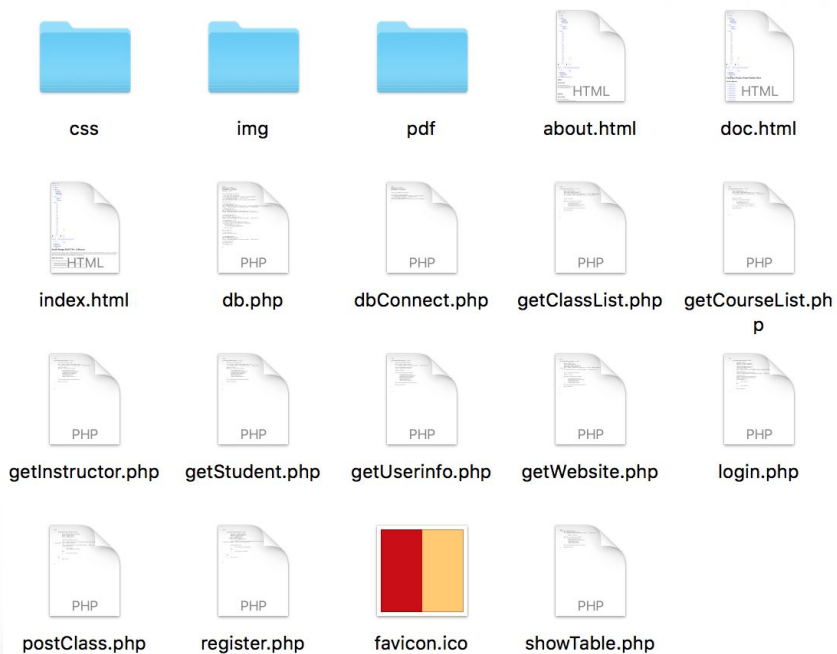
# Server/Database

- Link:

<input type="checkbox"/>	 Edit	 Copy	 Delete	id	class_name	b_id	class	link
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<input type="checkbox"/>				2	EE492	001	class2	<a href="http://may1714.sd.ece.iastate.edu/pdf/DesignDocume...">http://may1714.sd.ece.iastate.edu/pdf/DesignDocume...</a>
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<input type="checkbox"/>				5	EE492	001	class3	<a href="http://may1714.sd.ece.iastate.edu/pdf/Weekly_repor...">http://may1714.sd.ece.iastate.edu/pdf/Weekly_repor...</a>
<input type="checkbox"/>				6	test	003	class1	portfolioxcl.weebly.com
<input type="checkbox"/>				7	EE492	002	class3	<a href="http://www.google.com">http://www.google.com</a>

# Server/Database

- PHP:



# Live Demo

## Example:

- **UUID:**  
7b44b47b-52a1-5381-90c2-f09b6838c5d4-8
- **Course:** Sams\_Example\_Course
- **Class:** Lecture\_1
- **URL:** <http://www.samjonesisu.weebly.com>

## Professor:

- Step 1: register as a professor
- Step 2: upload course material

## Student:

- Step 1: Automatic iBeacon Scan -> phone silenced
- Step 2: Select course
- Step 3: View course material



# Technical Challenges

- Scanning and parsing the BLE iBeacon signal
- Setting up periodic iBeacon scanning.
- Adjusting UI as components are developed.
- Understanding and working with other member's code.
- Debug:
  - `com.cybeacon.course.CourseListActivity$3.onReceive()`
  - Sol: ProgressDialog initialization



# Website

IOWA STATE UNIVERSITY

Department of Electrical and Computer Engineering

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Documentation >

## Senior Design MAY1714 - CyBeacon

Our project is based on iBeacon, which is a mobile Bluetooth device that published by Apple in 2013. We will utilize this device and create a new Android App which will have the primary function of silencing your phones in a classroom, and send you information of this class such as announcement, lecture slides and homework. More functions will be added as we moving forward..

### Objectives/Goals

The goal of this project is to complete:

- Automatically silence phones when people entering certain area.
- Automatically pop up information about an object on your mobile device within an area.
- More functions will be added.

All goals are to be completed on time, under budget, and with priorities of safety.



iBeacon

<http://may1714.sd.ece.iastate.edu>

## Conclusion

- CyBeacon provides a way to improve the classroom environment.
- Application is built around the Android Bluetooth Low Energy package.
- Electrical Engineers can complete an app development project.

# References

<http://m.c.lnkd.licdn.com/mpr/mpr/AEEAAQAAAAAAAAALNAAAAJDk1OWY2OTMxLTFIMTMtNDEyOC1hN2Q0LWUyOTdkNGVjMjAxZA.png>

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