Project Title: Back Slouching Detector

Client Names and Affiliations: *Microsoft Research Redmond*

Team Member Names: *Jacek Karwowski*
                                          Taolun Li
                                          Gao Jun Tang

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Abstract

The app is designed to give a signal when a person's back slouches via a Bluetooth linked device that attached to the person's back. The signal in this case will play music to warn the user that his back is not straight. The target user of this app is the elderly people and the people who will have the responsibility to monitor the posture of an elderly. So the app will also have the feature to send SMS message and Facebook notification when the signal is triggered. Another possible function for the app is to plot a graph or do some analysis by using the data stored in the apps. For instance, we can calculate how many times a person slouch his back in a day, so that extra precaution can be taken at times where back slouching takes place too often.

Context

Project Background

For our app project, we are to use Touchdevelop to develop an app that can detect when a person's back is slouching using a sensor attached to the person's back. This will be an app demo for Microsoft Research at Redmond, Washington.

What Problem is Being Solved and Why

This app is designed for elderly people in wheelchairs, whose backs tend to slouch if they suddenly fell asleep. They can then fall off the wheelchair and injure themselves. The app seeks to solve this problem by detecting when the person's back is slouching too much and then playing an alarm of music to alert the elderly person about it so they can straighten their back. The app should also send a SMS the message to people related to that person so they know that they are in danger of falling off wheelchair. Another possible function for the app is graphing when the back slouching occurred, so that extra precaution can be taken at times where back slouching takes place the most often.

Team Skills and Summary:

Jacek Karwowski

Relevant programming experience:
- Machine Learning team project in Java, using Git, Gerrit, YouTrack, Eclipse
- Personal books database project in Python, using Django, HTML+CSS+JavaScript
- Web page for a real client, using AJAX, PHP, MySQL, HTML+CSS+JavaScript,

CompSci likes:
- Theoretical approach - algorithms & mathematics behind programming, C++, functional programming, high-   level languages (Octave, Python)

CompSci dislikes:
- Low-level languages (C, Asm), graphical design

Rather good communication skills and team working ability.
I think I'm better in coding and thinking about theoretical aspects of project than in designing creative apps. I also don't have any art skills.

What I would like to learn during this course is how to apply team management strategies (Agile strategies) in real life and to learn Android development, which I have never used before.

Taolun Li

Although I have little experience of coding in Java and developing mobile apps, I know Visual Basic very well and developed a complex inventory program using VBA in Excel for my A Level coursework. I also have some knowledge about C which is quite similar to Java in syntax. I really like the logical and mathematical part of Computer Science and I also enjoy writing small programs to do useful things. I don't like low-level languages like C which are prone to error. My team working skills are good but my communication skills are not that great. Through this project, I would like to develop my skills in Java programming in general and specifically learn more about developing mobile apps, preferably on android devices. My top 5 strengths from StrengthFinder 2.0 are Harmony (Relationship Building, Achiever (Executing), Adaptability (Relationship Building), Intellection (Strategic Thinking), Deliberative (Executing).

Gao Jun Tang

My relevant prior project experience is one of the computer science coursework that I have completed for the course Design and Professional Skills in the first term of my degree. Our goal is to define and carry out a plan to create a prototype design for a mobile app of a virtual company. The project scenario in this coursework is to form a team, agree roles, produce a summary plan (Gantt chart), decide as a team the priority of tasks, design a product, and produce a prototype incorporating potential customer feedback as well as a video of the project. I believe that my team working ability will not be an issue for the team as I have learnt the importance of working as a team through the course of my first year degree Integrated Engineering where I was assigned to an interdisciplinary group to tackle real life problem. I have also possessed some basic programming languages like C, Haskell, Python and Java. I do not like low level programming languages like C, however I do not have special preference to any programming skills. My top 5 Strengths are as a result of the StrengthsFinder are Restorative (Executing), Developer (Relationship Building), Harmony (Relationship building), Analytical (Strategic Thinking) and Woo - Winning Others Over (Influencing).

Individuals Roles in the Project
- Team Leader and Project Manager: **Jacek Karwowski**
- Lead UI designer and User Testing: **Jacek Karwowski**
- Documentation Lead: **Taolun Li**
- Programming and Repository Lead: **Taolun Li**
- Technology Platform Research Lead: **Gao Jun Tang**
- Lead Interviewer for Requirements: **Gao Jun Tang**
- Lead Device/Platform Tester: **Gao Jun Tang**

Work Plan

Task List:

Name	Begin date	End date
Programming Practice	1/22/15	2/19/15
Attend each lab sessions to sharpen our programming skills that are needed for the project.		
Skills Summary	1/22/15	1/23/15
Meet up with teammates for the first time and create an individual skills summary which include relevant prior project experience, communication and team working ability, Computer Science likes and dislikes and any other information that we think that the client and the British Computer Society should know.		
Roles Distribution	1/22/15	1/23/15
Assign roles amongst the team based on the skills summary.		
Interview Question	1/24/15	1/29/15
Brainstorm and prepare some questions for the potential clients which include capture requirements and more details about the project.		
Capture Requirements	1/30/15	2/4/15
Interview with the clients (Microsoft Research Redmond) and apps coordinator (Dr. Dean Mohamedally) to gather the requirements of our project. Close any more requirements in the last meeting and present the list of requirements for the client to agree to.		
Prototype of the Apps	2/5/15	2/14/15
Mock up a paper prototype of the application in sketches and in a digital format such as a HTML view. Identify common variables and data required, given them appropriate names and create a Data Dictionary of the project.		
Design Feature	2/5/15	2/14/15
Classify the requirements based on MoSCoW style and start design the app basic features and functions.		
Design User Interface	2/5/15	2/14/15
Start design user interface using HTML/CSS/Javascript		
Design Report	2/15/15	2/19/15
Compile a report which show the overview progress and contents to conclude the milestone 1 of our project.		

Main Build	2/20/15	3/2/15

Using the knowledge learnt, we will build the app by only focusing on Must have and Should have requirements or features.

First demo	3/3/15	3/6/15

We will show the fisrt demo to our client and get feedbacks from them. We will also try to test our apps on real life user.

User Experience Report	3/7/15	3/8/15

After getting the feedbacks from both the clients and user the first time, we will fix and evaluate the problem arised.

Final Testing	3/9/15	3/31/15

Create code to test our app.

UCL Advances Demonstration	4/1/15	4/2/15

After complete designing the apps, we will be showing our app on UCL Advances.

Evaluate App	3/14/15	4/17/15

After the demonstration, we will now evaluate our app to a better and much more functionality app by including the Could have requirements.

Create Video	4/18/15	4/22/15

We will create a video to show the function of our apps and the impact that ours apps can make to the world.

Individual Report	4/23/15	4/27/15

Each member will have to complie a report to sum up the project.

Final App	4/28/15	4/29/15

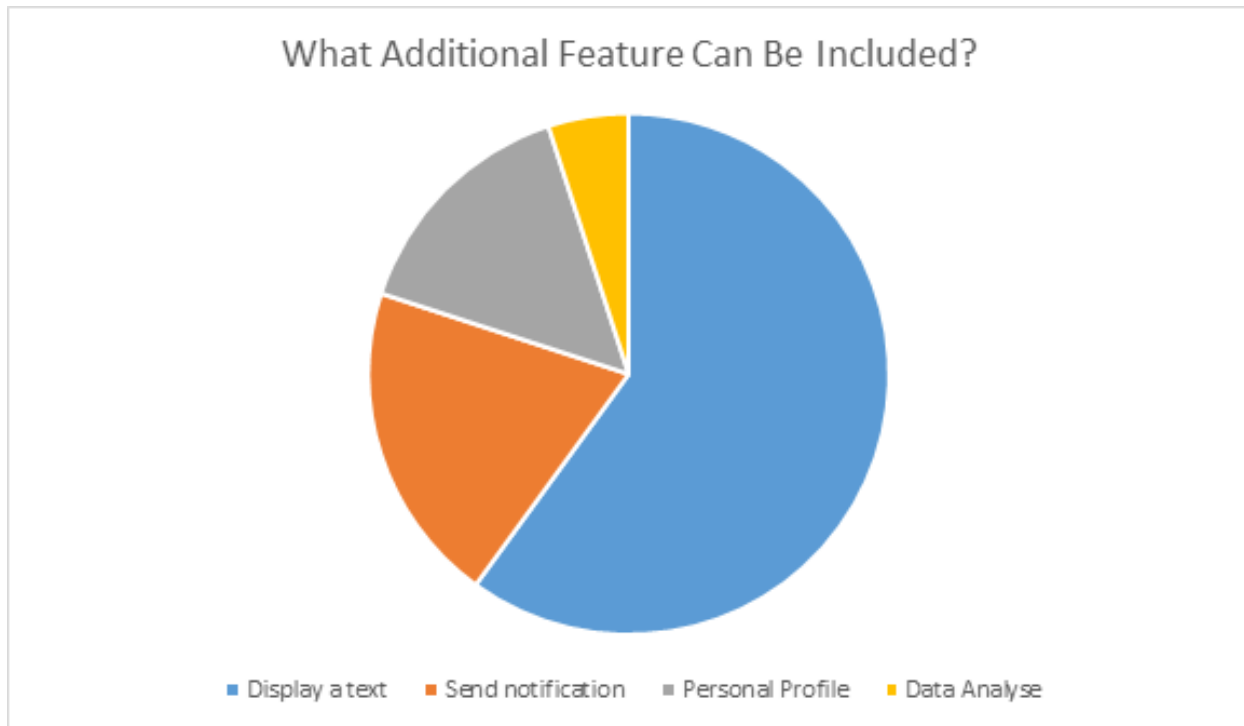We will hand up our product, the final app to our client

Requirements

Requirement Gathering Process

On the 10th of February at 12:00, our team finally interviewed Dr Dean Mohamedally, the app coordinator about our app project.

In the interview, Dean first told us about the hardware aspects of the project, which included using a small device (which is to be built by Graeme McPhilips) with an accelerometer, microprocessor, and Bluetooth capability to detect the back slouching, and then having the microprocessor send a signal via Bluetooth to the main program written in Touchdevelop so action could be taken. Next, he suggested several software features, which contain both the essential components, such as making the program written in Touchdevelop local on mobile devices using Cordova and sounding music or alarm when the back has slouched too much, and several extra functionalities such as plotting a graph about the when and how many times the person's back slouched, sending SMS messages or posting Facebook messages when the back has slouched. Dean also suggested that we should interview some elderly people about what they would like to see in the app.

On the 12th of February, our team had a meeting during which we explored more functionalities that we can include in this app. We realised that since different people have different heights and different natural back arching, we needed to calibrate the sensor to suit each individual's needs. Also, the target audience for this app is mainly elderly people, who normally have bad hearing and eyesight, and so we decided we should make the text huge and add a volume control.

What Additional Feature Can Be Included?

■ Display a text　■ Send notification　■ Personal Profile　■ Data Analyse

We have managed to get 50 respondents to fill out a questionnaire form asking what additional feature can be included after they have tested our app for the first time. The response were very positive as most of the respondents have given quite useful advices and recommendations. The tabulated results from the questionnaire are shown in the pie chart above. More than half of the respondents suggested that our app can not only play alarm to warn the users that their back were slouching but should also display a text so that for those who accidentally set the volume of alarm to the minimum can still be notified. Around 20% of the respondents thought that sending a notification to someone who cares is important as the targeted group of the app is the elderly people. Beside these, some people suggested that it will be great to have a personal profile when you login the app and add in function that can analyse the data that the app has collected. Based on the result that we got from the respondents we made changes to our app in hope of increasing the user experience.

List of Requirements

Must have:
- Detect when a person's back is slouching using a sensor attached to his/her back – Completed
- Sensor sends data to Touchdevelop program using Bluetooth[1] – Completed
- Play music when back is slouching to a certain degree - Uncompleted*
- Calibrate the sensor to specific people – Completed
- Large text font so users can better see and use the app – Completed

Should have:
- Select one specific sensor to pair with app – Completed

- Option to choose music and volume – Completed (only the volume can be chosen)
- External file to store settings. Plain Text File – Completed (setting is stored in TD records instead)
- Send SMS to specific people – Uncompleted**
- Plot a graph of when and how many times the person slouched – Uncompleted

Could have:
- Input personal information (age, gender, etc.) – Uncompleted
- One person (nurse, doctor, etc.) could monitor several people – Uncompleted
- Locally store sensor data – Completed (only stores calibrated sensor data)
- Cloud synchronization of data – Uncompleted, as Cordova does not seem to work with cloud synced records
- Data analysis – Uncompleted
- Each person has their own account and store the settings for each person – Uncompleted
- Sensor sends data also to relatives – Uncompleted
- Facebook notification – Uncompleted**
- Voice Message – Uncompleted

Would have:
- Sending emails – Uncompleted**
- Twitter notification – Uncompleted**

*There is a problem with the Cordova media plugin that causes the phone to not play the alarm when the user's back is slouching. We have already contacted Peli from Microsoft about this but did not receive an answer yet. We expect our code to work once the plugin is fixed.

**There seems to be no implementation of sending/sharing the message without pressing a send/share button in TD.

Glossary

Accelerometer - A sensor that detects acceleration relative to freefall in the x, y, and z-axis.

Cloud synchronization - Storing data on a web servers that is updated on the web server when a change is detected in the app.
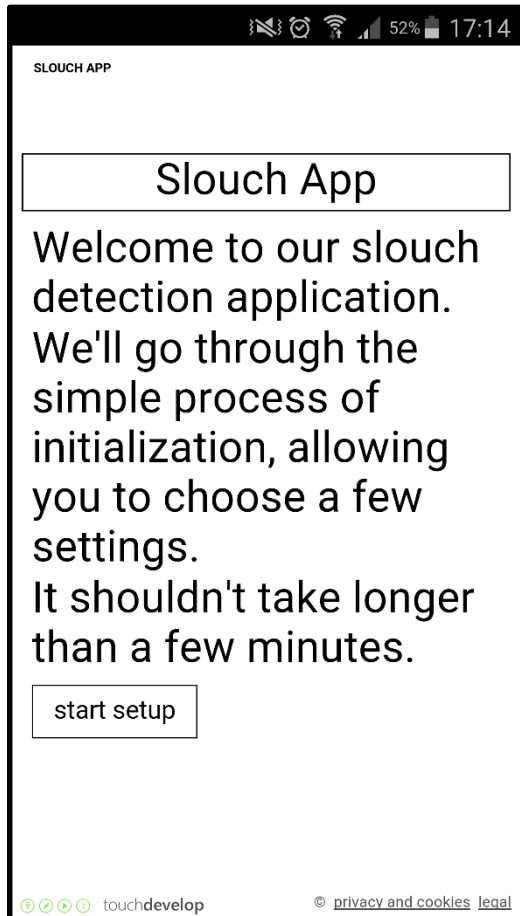
Data Structure and File Formats

We stored our settings and calibration data in two separate TD records[2] which is a kind of data structure. Other than this, no other data structure is used.

The file formats we used for this app are wav for audio, png, jpeg, etc. for images we are going to put in the UI.
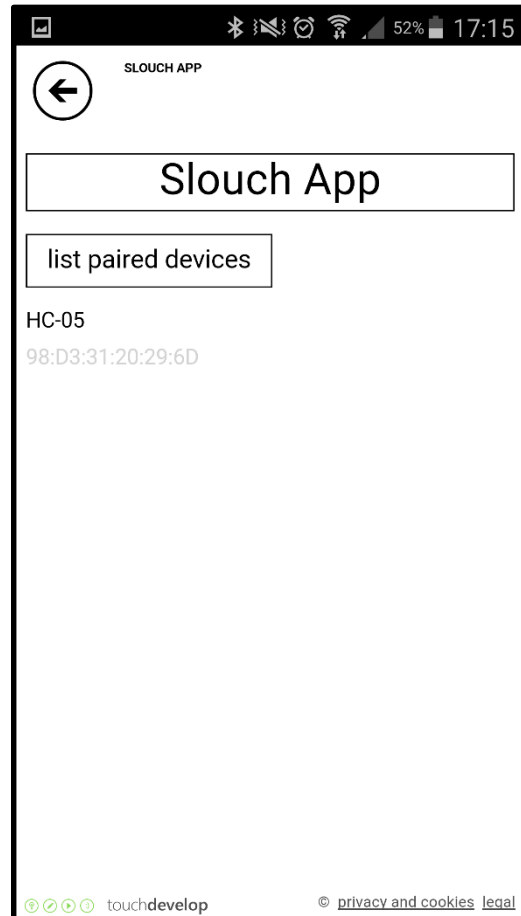
Design

UI

Title Screen

Bluetooth Connection Setting

Alarm Settings
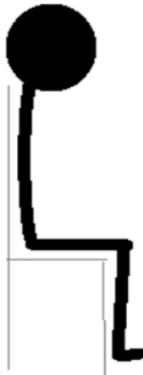
Calibration – Sitting Straight

Calibration – Slouching

Finish Page

Slouch Detection Page 1

Slouch Detection Page 2
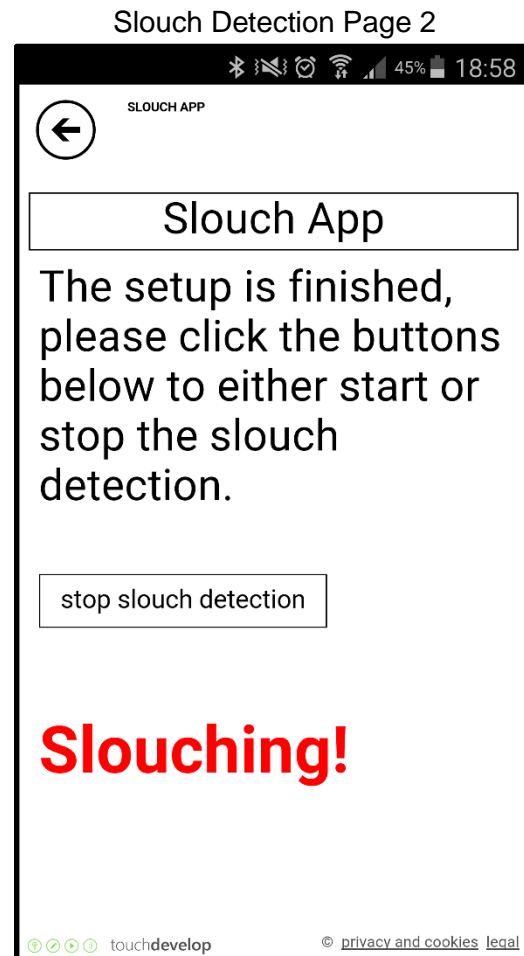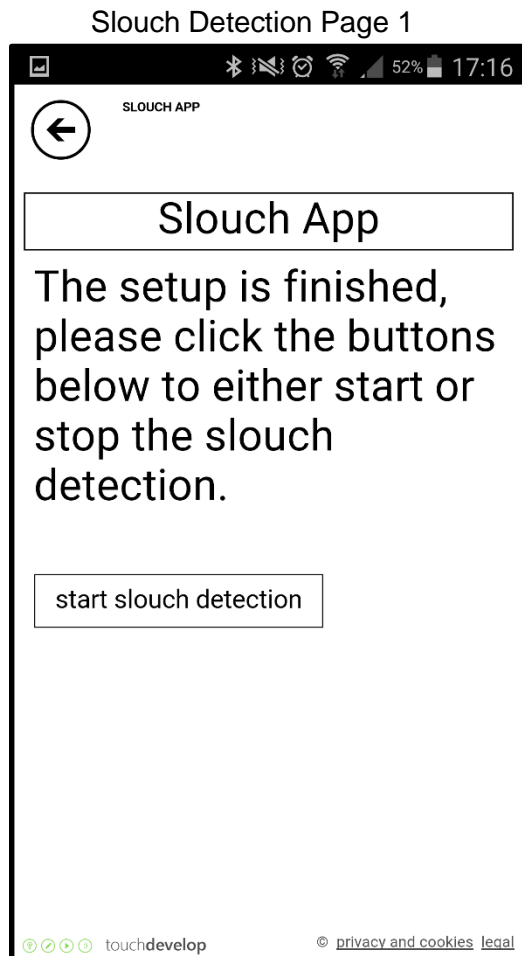
Technical Design

List of views:

a) Introduction page

b) Connecting to specific Bluetooth device

b) Volume setting

c) Calibrating the sensor

d) Final Page

- redo setup
- start slouch detection

Algorithms, data structures, libraries, etc. used:

No algorithms were used since the only thing we need to do is to compare sensor readings to pre-calibrated ones.

We used the record table data structure provided by TD in our app, in order to store settings and calibrated sensor data.

The TD libraries that we used in our app are Cordova Bluetoothserial[3], Layout[4], Theme[5], and Forms[6]. The Cordova Bluetoothserial library allowed us to connect the accelerometer device

with our app. The Layout and Theme library is used in UI design to specify the format and layout of text areas. The Forms library provides implementation of text boxes, check boxes, etc. We also customized the Forms library[7] so a warning is displayed when numbers outside a specified range are entered into the text box.

Package code design

We haven't managed our code ourselves, because Touchdevelop do this automatically.
The structure is following:
Functions:
- main()
- show title()
- calibrate()
- detect slouch()
- get readings()
- initialize()

Pages:
- connect
- finish
- slouching page
- straight page
- sms*
- statistics**
- title page
- volume

Database tables:
- Calibration table
- Settings table
- Slouch Data table

Resources:
- alarm sound
- slouching picture
- straight picture

Libraries:
- cordova bluetoothserial
- forms
- layout
- theme
- widgets

*The sms page is done and it is fully functional. however, since Touchdevelop right now does not allow the message to be sent without pressing the send button, it is not part of the final app. In the future, if it becomes possible to do that, we could reintroduce it to the app.
**The statistics page is not in the final app, it is in the testing phase to see if the settings and calibration values are stored in the record tables.

System flowchart
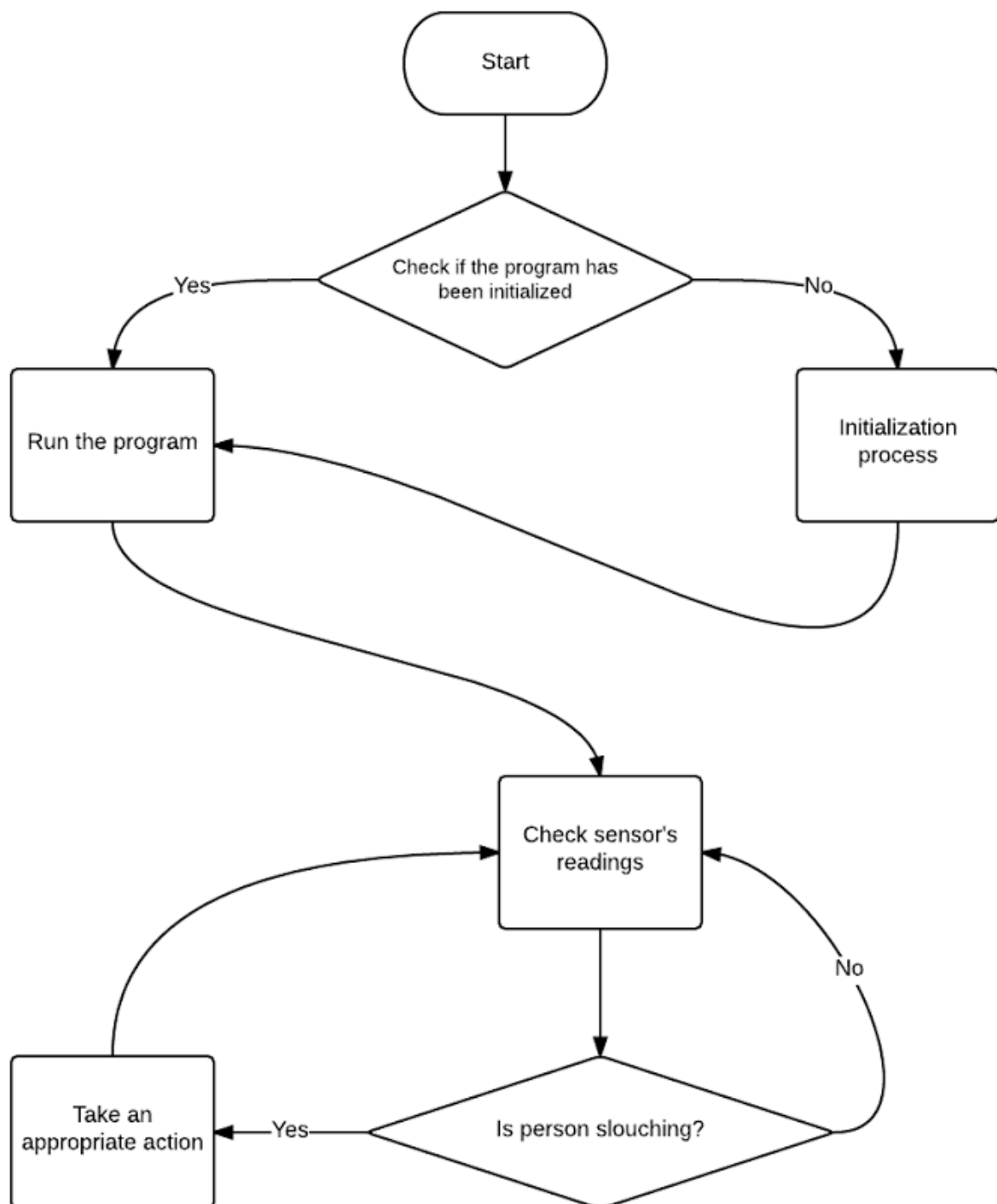
Design Pattern

Singleton Pattern - "A creational software design pattern. It is a design pattern that restricts the instantiation of a class to one object."[8] This is relatively useful to our apps as exactly one object is needed to coordinate actions across the system of our app.

Adapter Pattern - "A behavioural software design pattern that allows the interface of an existing class to be used from another interface. It is often used to make existing classes work with others without modifying their source code."[8] This pattern can be seen in the numerous pages that we created for our apps.

Observer Pattern - "A behavioural software design pattern and a one-to-many dependency between objects so that when one object changes state, all its dependents are notified and updated automatically."[8] It is mainly used to implement distributed event handling systems. We implemented this pattern when we create the function for the slouching detector page.

State Pattern - "A behavioural software design pattern. It encapsulate varying behaviour for the same routine based on an object's state object. It acts as a cleaner way for an object to change its behaviour at runtime without resorting to large monolithic conditional statement."[8] We implemented this pattern in the transition from the main page to calibration screen and settings screen.

Command pattern - "A behavioural software design pattern. It encapsulate a request as an object where you parameterize clients with different requests, queue or log requests, and support undoable operations."[8] This pattern is integral in our app as we constantly parameterize clients with various requests.

User Testing

For testing our app, we mainly focused on the app's ability to calibrate the slouch detection to people of different heights, different degrees of slouching and to different positioning of the sensor. The result are as follows:

Person 1
Height: 185cm
Sensor Position: On shoulder
Pass/Fail: Pass

Person 2
Height: 171cm
Sensor Position: On shoulder
Pass/Fail: Pass

Person 3
Height: 160cm
Sensor Position: On shoulder
Pass/Fail: Pass

Person 4
Height: 180cm
Sensor Position: Parallel to the spine just below the shoulder
Pass/Fail: Pass

Person 5
Height: 173cm
Sensor Position: Parallel to the spine just below the shoulder
Pass/Fail: Pass

Status and Evaluation

Components Completed

Completed work packages per person
Taolun Li
- Slouch detection
- Calibrate app to specific people
- Play alarm of chosen volume when back is slouching
- Bluetooth connection
- Receiving accelerometer data from Engduino using Bluetooth

Jacek Karwowski
- UI design

Gao Jun Tang
- Bluetooth connection
- Receiving accelerometer data from Engduino using Bluetooth

Uncompleted work packages per person
Taolun Li
- Sending a SMS when back is slouching
- Social media notification
- Plot graph of the times the person slouched
- Cloud synchronization of sensor data

Jacek Karwowski
-

Gao Jun Tang
- Connecting to sensor tag (BLE device)
- Receiving data from sensor tag

Evaluation of Progress

Our project is nearly finished and the app is just one step away from being deployable. The cordova media plugin still has not been fixed. The app does not crash and shows no error message when code requiring the plugin is run, however, no sound is played at all. We have already contacted Peli from Microsoft Research about this but heard no response yet.

References

1. Based on https://www.touchdevelop.com/emezc by David Xiao
2. https://www.touchdevelop.com/docs/records
3. https://www.touchdevelop.com/gumze

4. https://www.touchdevelop.com/cwgn
5. https://www.touchdevelop.com/gnvi
6. https://www.touchdevelop.com/qoeb
7. https://www.touchdevelop.com/cokn
8. Design Patterns: Elements of Reusable Object-Oriented Software by Erich Gamma, John Vlissides, Ralph Johnson, and Richard Helm.

Appendices

Feedback From Client

Add the title of the app to the top of every page of the app.
Make spaces between labels, text boxes, buttons, etc. larger.
In the slouch detection page, make the "Slouching!" warning text red, bigger, and centered.
The app shouldn't repeat the initialization process every time it opens.

Meeting Minutes

22/01/2015

Tasks:
- Each write a short paragraph describing our skills and experiences in CS.

29/01/2015

Notes:
- We are to design an app to detect the slouching of the back using Bluetooth accelerometer device attached to the back of the user.
- An alarm needs to be played to when the back slouches.

Tasks:
- Each should think of some questions to ask our clients during interviews.
- Each should try some tutorials on Touchdevelop.

10/02/2015

Notes:
- In addition to the requirements mentioned before, we could also include features such as sending SMS to relatives and posting on social media when the user's back slouches.
- The app should be easy to use.

Tasks:
- We should contact Graeme McPhillips about the Bluetooth accelerometer device.

12/02/2015

Notes:
- Texts and buttons should be large
- Sensor should be calculated according to the degree of slouching of each person
- Need options to send SMS and to play alarm
- The alarm and its volume should be chosen by the user

Tasks:
- Jacek should design alarm and volume interface.
- Taolun should design the SMS settings interface.

- Gao Jun should design the calibration interface.
- The person who designed the best looking interface will be responsible for designing the entire interfaces.

20/02/2015

Notes:
- Meeting with Graeme for the first time after a long time of scheduling
- Visiting his lab, he shows us around and explains that he is in the middle of developing the sensor and he can't give it to us now

Tasks:
- Read something about bluetooth connection in TD and try to look up for the chip on which Graeme is building his sensor

25/02/2015

Notes:
- Meeting with Graeme for the second time. He says that since the development process takes too long he will buy us another sensor, which should be ready-to-use. However, that new device use BLE technology, so it may take some time to learn how to use it.
- He show us the 'toolbox' application from Texas Instruments with which we should be able to test sensor

Tasks:
- Read something about BLE in TD
- Download and try the Texas Instruments app

26/01/2015

Notes:
- The sensor was just delivered

Tasks:
- Test it using the app, check every function of it (battery, accelerometer, buttons, LED, BLE)

27/01/2015

Notes:
- After the lecture we split current tasks: it appeared that BLE doesn't work and the problem needs further investigation. Jun said he will try to do that. Also, we are starting to develop UI (it was Jack who got that task) and basic functionality (SMS, sound notifications) - Toby will start working on that.
- We make sure everyone is satisfied and OK with his part.

Tasks:
- Everybody should start working on his assigned area.

05/03/2015

Task:
- Look up for more information and details about both the hardware and Touchdevelop Cordova.

07/03/2015

Tasks:
- Looks up Cordova plugins, for example Bluetoothserial plugin etc.

12/03/2015

Tasks:

- Work with David's and Robert's group to get more details about bluetooth communication.
- Look through study material given by Graeme.

19/03/2015

Tasks:

- Explore more around how to change the size of pictures in TD
- Continue trying to connect our app to BLE device

26/03/2015

Notes:

- The accelerometer device uses BLE which is completely different from Bluetooth, unlike we initially thought.
- We need to write a wrapper around the Cordova plugin that manages BLE to detect BLE devices.
- Try running the program on a computer with the BLE dongle plugged in.

Tasks:

- Write and test the wrapper around the BLE Cordova plugin.

29/03/2015

Notes:

- Email Peli from Microsoft Research to find out the problem of cordova.media plugin.

Tasks:

- Fix cordova.media plugin

9/04/2015

Notes:

- Discussed our bluetooth connection problem with Robert.
- We should use Bluetoothserial library in Touchdevelop

Task:

- Continue work on the bluetooth connection
- Find material for project video

11/04/2015

Notes:

- Video was done.

15/04/2015

Notes:

- Impossible to implement sending SMS or posting on social media when back is slouching because the send/share button needs to be pressed.
- Problem with the Cordova media plugin that causes script to crash when trying to play the alarm.

Tasks:

- Contact Peli again about the Cordova media plugin problem.

22/04/2015

Notes:
- The Cordova media plugin problem is still not fixed. Although the app no longer crashes when it executes the alarm play command, the app does not actually sound the alarm.
- Change the app icon from the default Cordova one
- Increase the space between text boxes, labels, buttons, etc.
- The app should not re-initialize every time it is closed.
- The "Slouching!" warning text should be larger, red, and centered.
- Remove noise from the app video.
- Do not mention that the app works in Windows Phone and iOS in the app video.
- Make the app screen larger in the app demo video.

Tasks:
- Contact Peli from Microsoft Research about the new media plugin problem.
- Correct all of the above.

Bi-Weekly Reports

Report 1

Due to us not getting the chance to interview anyone about our app project until Week 4, we didn't really have any idea of how to work on the app and wasn't very productive during Week 2 and 3.

22/01/2015 at 11:00 – Met with each other for the first time, and each wrote a paragraph of text summarizing our skills, previous experiences and interests in CS.

29/01/2015 at 11:00 – Finally received some information about our client, Microsoft, and the project that we are going to work on, which is detecting whether somebody's back is slouching. We then thought of several questions we would like to ask our client when interviewing him. We also tried several tutorials on Touchdevelop, the programming language for this project.

03/02/2015 at 3:00 – We thought of even more interview questions.

03/02/2015 at 5:00 – We along with other app groups and coding curriculum groups participated in a skype call with Microsoft, and although there wasn't enough time to cover every project, including ours, we did learn some things about Touchdevelop and linking it to external devices via Bluetooth.

05/02/2015 at 11:00 – We spent some time in the lab looking at more Touchdevelop, to become more familiar with its syntax and way of coding.

10/02/2015 at 12:00 – We were finally able to interview Dr Dean Mohamedally, the app coordinator about our app project, and gained more insight into how we should design our back slouch sensor to provide better user experience and better useful functionality to its target users.

12/02/2015 at 11:00 – We met in the labs and started designing the app interface and deciding which design features or functions we should implement first. In the end, we agreed that text and buttons should be big, there should be a feature to calibrate the sensor to specific users, and options to send SMS messages to other people and play an alarm or music (whose volume is decided on by the user depending on his/her hearing ability) when the person's back is

slouching. We then decided to assign each person in the group one specific UI of the app to design by Sunday. We will then see whose design is the most suitable and assign the role of UI design to that person.

Future Meetings – We plan to have at least 1 long meeting during reading week, where we will discuss more about our app design, features, and probably start coding for some basic functions. We will also work on the Milestone 1 Report together.

Report 2

Due to us not getting the chance to interview anyone about our app project until Week 4, we didn't really have any idea of how to work on the app and wasn't very productive during Week 2 and 3.

18/02/2015 at 13:00 – General meeting, we discuss on our roles in team, list all tasks we need to do, split them between us. Start writing Milestone 1, we'd done the parts which require participation of every member. Then we go through all the design, discussing every part of the app together. Finally, we set up the deadlines for particular parts of Milestone 1.

20/02/2015 at 15:00 – Met with Graeme for the first time, he explains the technical details of his sensor, shows us the hardware and software, and points us to useful resources.

25/02/2015 at 14:00 – Met with Graeme for the second time, talk about the problems he have with developing that, he offers us another device instead of his not-yet-ready sensor. He promises to get it as soon as possible.

26/02/2015 at 14:00– The sensor is delivered, we go to pick it from Graeme's office and test it for a while to check if it's ok.

27/02/2015 at 13:00 – Met together, discussed the blocks of our application, which were presented on the lecture, set the date of future meetings, split the current tasks (testing code of our sensor, looking for a solution of a problem of sending the data (protocol), testing Touchdevelop native Bluetooth library, contributions to Bi-weekly report) among team members.

Report 3

03/03/2015 at 11:00 – We divided the tasks to three main parts and allocated evenly within ourselves. One person will work on the communication part where he have to know the protocols or any related library and figure out the way to connect to the Bluetooth device. Another person will work on the features of the app for instances play music function and set volume function. The last person will work on the user interface where he have to create the app graphics.

05/03/2015 at 11:00 – We had a meeting to find out the solution of connecting our app to the Bluetooth device. We found out that the way we used the Cordova from Touchdevelop is not working on the device. We decided to look up for more information and details about both the hardware and Touchdevelop Cordova.

07/03/2015 at 13:00 – We got more information about the Cordova and found out that our initial approach was wrong. We decided to try again by using the Cordova plugins.

11/03/2015 at 10:00 – We went to meet Graeme again to discuss more about what the Bluetooth device can offer. He promised to share all of the software and information related to the device to us via Dropbox.

12/03/2015 at 11:00 – We had a meeting during the lab to update the work progress of everyone. The features design and user interface of our app are on their way to completion. However, we found out that we are still having trouble to communicate our app with Bluetooth device. We even had a brief discussion with other groups which are working on the similar project only to find out they are having the same problem too. We decided to work together and share the information and knowledge once anyone has a breakthrough on this topic.

Report 4

Because it's nearly the end of the term and we had a test and many deadlines, we did not manage to get too much work done. Also, we were still unable to connect the accelerometer to our Touchdevelop program which halted progress of some other features of the program.

17/03/2015 at 13:00 – Started working on a general graphing library that could be altered to plot different kinds of graphs. This would allow us to plot a graph of the frequency of back slouching during different periods of time.

19/03/2015 at 11:00 – We described our project to UCL Advances and also gave a presentation about our project (task, achievements, and self-evaluation) to the TAs. After this, we resolved some issues with how Touchdevelop creates an UI interface and standardized the dimensions of each screen of our app. However, there's a slight problem with resizing the image we want to put in two of the screens. We still did not manage to understand how to get the accelerometer device to connect to our mobiles via Bluetooth.

21/03/2015 at 14:00 – We managed to find a way to resize the images we want to put on the screens. Also, we noticed problems with setting the alarm volume function and thought of a way to resolve the problem.

25/03/2015 at 13:00 – Finished the graphing library so it can plot general graphs. However, this is not tailored for our problem.

26/03/2015 at 11:00 – We discussed with the TAs, Dean, and Ms Venus Shum about our problem of not being able to connect the device to the Touchdevelop. Upon further discussion, we found out that our device uses BLE instead of Bluetooth which means what we were trying to work out before was impossible. However, Ms Shum told us that we should try getting the device to connect to a computer (with a BLE receiver module connected) and to write a wrapper in Touchdevelop for the Cordova plugin that manages BLE. We wrote part of wrapper during the lab session but did not get to test it yet.

Report 5

Due to the Easter Break, our team was not able to have many face to face meeting compare to the previous weeks as two of the team members were away. Despite that, we still continue work on our project through social media.

29/03/2015 at 13:00 – We managed to have a meeting right before some of the team members left for holidays. As mentioned in the previous report, we were trying to write a wrapper in Touchdevelop for the Cordova plugin that manages BLE and tried to connect the device with our computers. However, this did not turn out well as we were trying to export to Cordova it showed up error saying cordova.media was not found. We were unable to find a solution at that moment so we decided to give all of us some time to find the solution.

09/04/2015 at 14:40 – We were asked to present a demo of our app to Prof. Dean. As we were unable to connect the BLE device with our app, we can only show the main functionality of the app. We also managed to address the problem that we are facing to Dean and he suggested we worked with the other group who has a similar project. With the help of the other group, we were told to use the Bluetooth library in the Touchdevelop.

11/04/2015 at 11:00 – We meet up to create the video for our project. We gathered our thoughts and ideas to make the video more interesting and entertaining while in the same time provide a detailed overview of our app.