

**— Your Study Helper**

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Words: 1571

# 1. Introduction

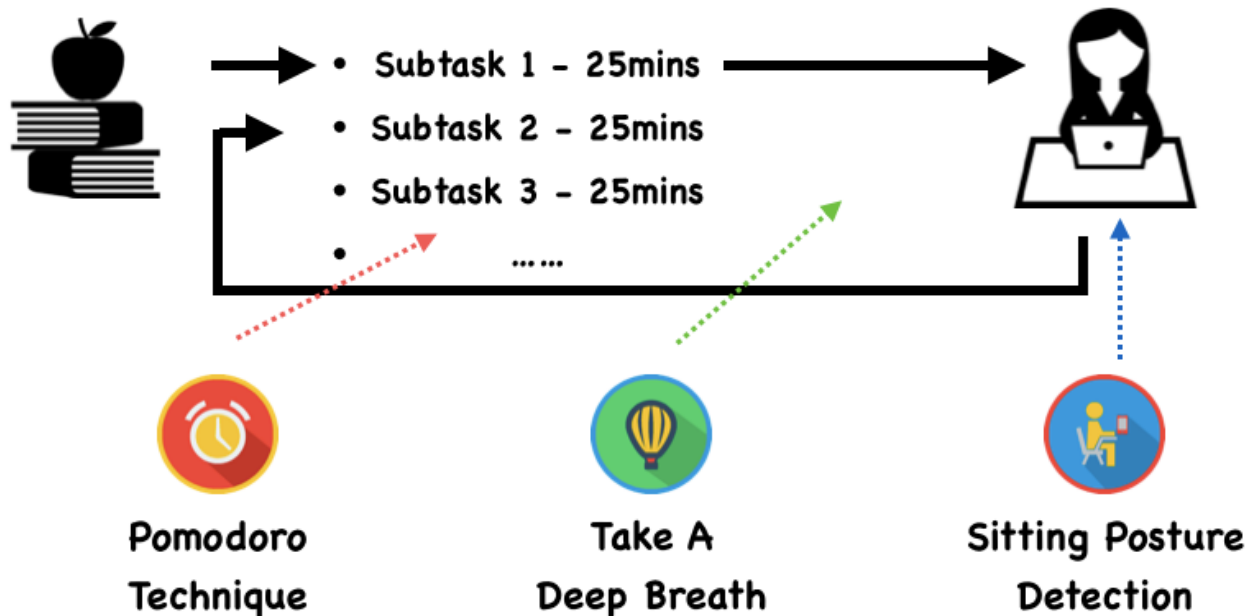


The idea of Focus came from situation where most students found it hard to focus on their assignments due to the distractions of their phones. The study of Kuznekoff and Titsworth described in detail in the January issue of The Teaching Professor. Using an intriguing study design, here's what they found: “. . . students who use their mobile phones during class lectures tend to write down less information, recall less information, and perform worse on a multiple-choice test than those students who abstain from using their mobile phones during class.”(Kuznekoff & Titsworth, 2013)

It seems that mobile phones are becoming one of the biggest distractions for students in their daily life. In this way, we wonder if there is an app that can change mobile phones from distractions into study helpers. For example, why not make the mobile phone as a sitting posture detector or an efficient timer to show study time and break time. Therefore, we made Focus.

(Apper context can be found in Section 6: Apper Projects: Apper Context)

## 2. Overall Design



**Improve study efficiency by conducting Pomodoro technique.**

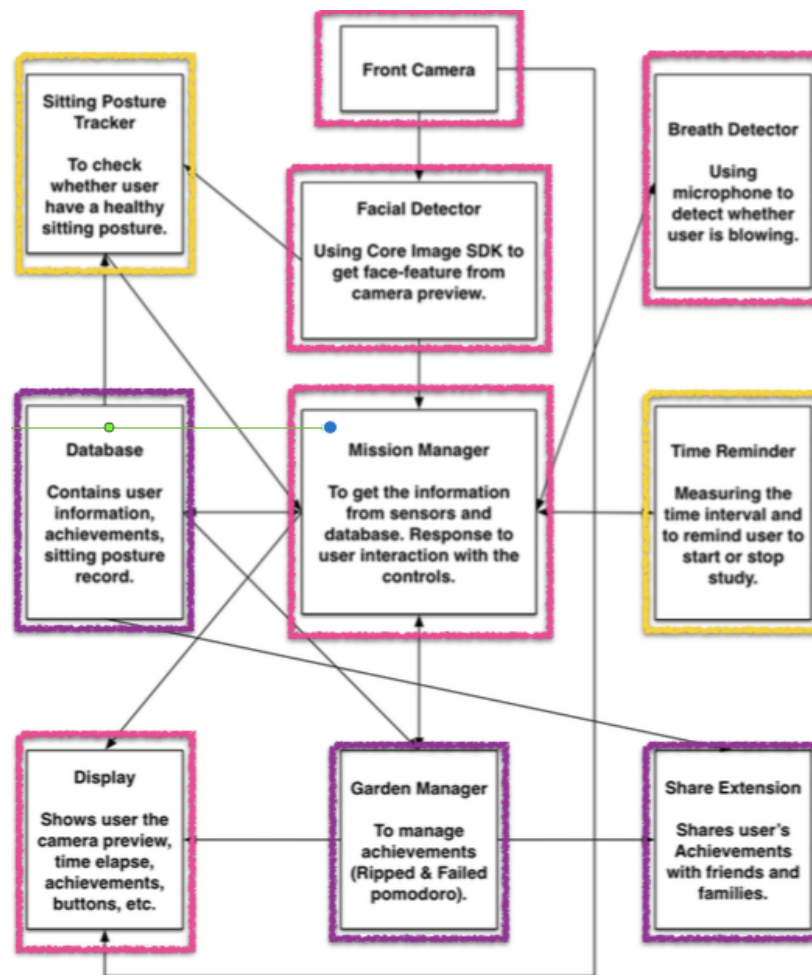
The core function for Focus is a timer based on Pomodoro technique, which is to break down work into intervals traditionally 25 minutes in length, separated by short breaks. The method is based on the idea that frequent breaks can improve mental agility.

**Help users take a deep breath to relax their minds.**

Before the user starts his task, Focus will ask him to take a deep breath to the microphone several times. This method is based on the idea that taking a deep breath can eliminate the worries and stresses that are distracting him and help to focus on his task easily.

**Correct sitting posture while reading or using laptops.**

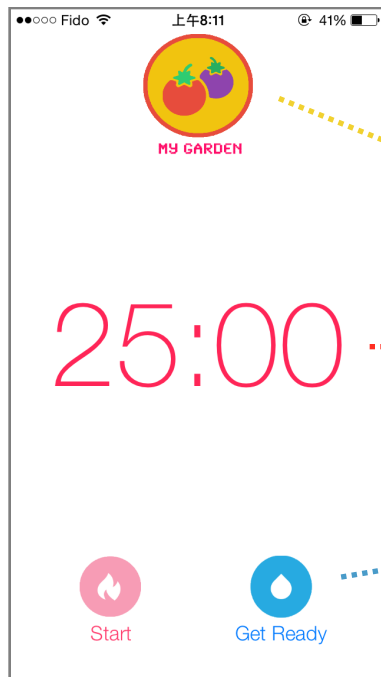
Focus can track user's sitting posture by facial detection technique. Once the user is too close to the laptop. A red rectangle will appear on the screen to remind him to sit correctly. This method is based on the idea that good posture benefits better memory retention.



The block diagram consists 10 blocks in total.

- **Mission Manager** is the central controller which is responsible for getting information from sensors and database.
- **Facial Detector** uses Core Image SDK to get face-feature from front camera.
- **Sitting Posture Tracker** could check whether the user has a good sitting posture by analyzing the data from **Facial Detector**.
- **Breath Detector** uses low passing filter to detect whether the user is exhaling to the microphone.
- **Time Reminder** is responsible for measuring the time and helping users to use pomodoro techniques.
- User information and achievements will be stored in the database. Also, users could view the information stored in database from **Garden Manager**.
- **Share Extension** helps users to share their achievements with their friends and families.

### 3. Statement of Functionality & Screen Shots



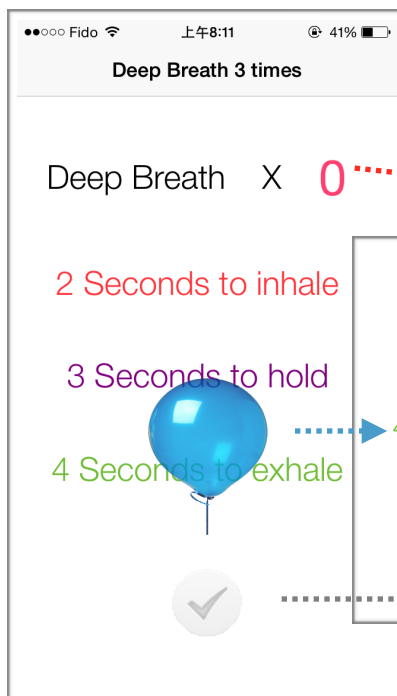
Home screen of Focus

This is the Home screen of Focus.

On the top is the Garden where user can review how many pomodoro he got last week.

In the centre is a 25-minute timer representing a single pomodoro section. Between two pomodoro sections, there is a 5-minute break.

On the bottom, there are two buttons: Start and Get Ready. The Start button is initially disabled unless the user clicks Get Ready to do three preparation settings.



Preparation 1: Relaxing Breath

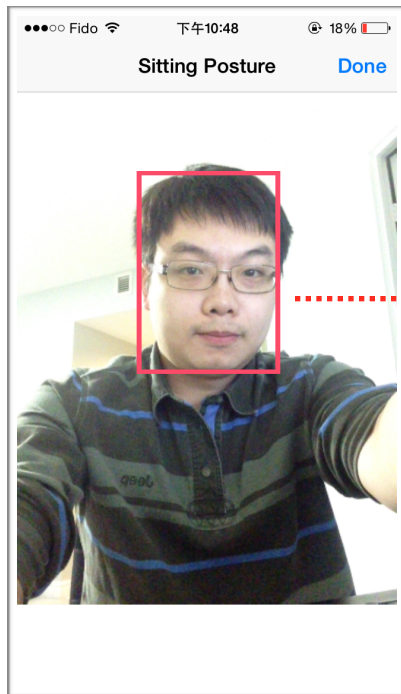
This is the Relaxing Breath screen.

In this page, user need to take three deep breaths according to the instruction appeared on the screen.

With user exhaling to the microphone, the balloon will get bigger until it explodes.

After three deep breathes, the grey button will be activated and user can click it and go to Preparation 2: Sitting Posture Setting.

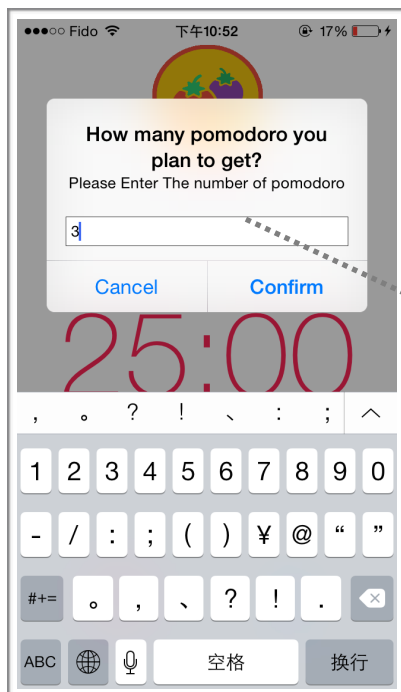
The balloon becomes bigger with user exhaling to the microphone.



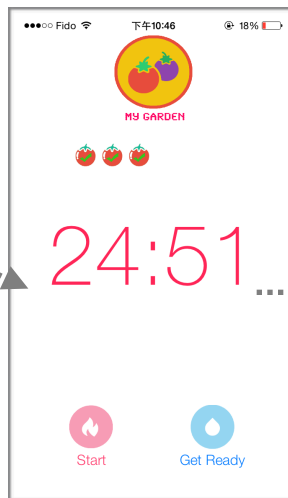
This is the Sitting Posture Setting screen.

When the user enters this screen, a red rectangle will appear in the top middle screen to notify user to put his eyes and mouth in this area. Because this function users Core Image SDK to get face-feature from front camera to measure the position of user's eyes and mouth.

### Preparation 2: Sitting Posture Setting

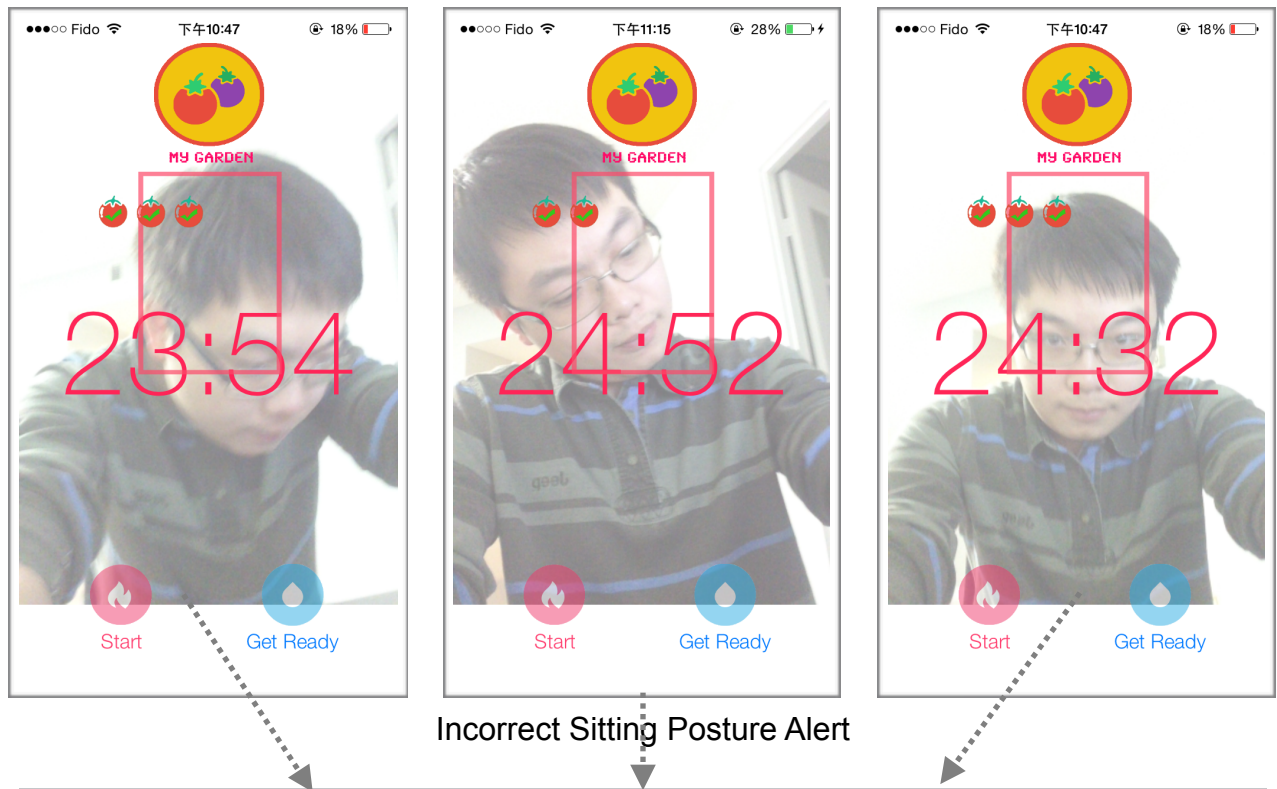


### Preparation 3: Choose Number of Pomodoro

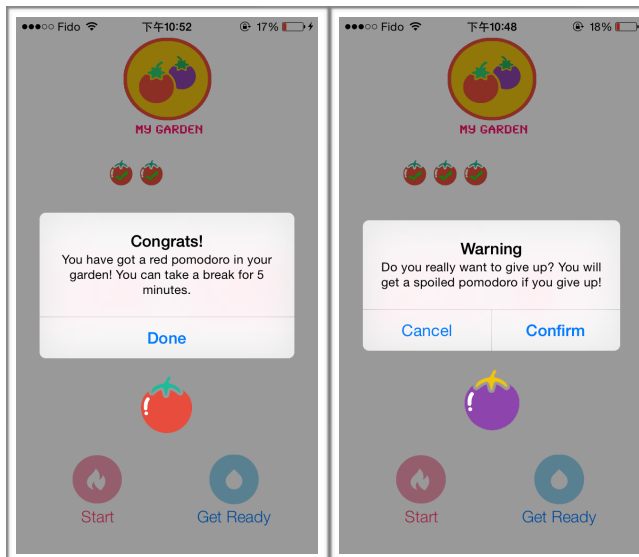


This is the Preparation 3: Choose Number of Pomodoro screen.

The user is asked to fill out how many pomodoro he wants to have in this task. Since each pomodoro represents 25-minute study time. In other words, it asks how long the user wants to study. Once the number of pomodoro is set, the timer will count down and Focus will do its job.



During each 25-minute study time, Focus will continuously monitor user's sitting posture based on the distance data between his eyes and mouth from Facial Detector. If the user sits too inclined or too low, the main screen will turn into semitransparent and the red rectangle will appear to ask the user put his head back to the area.

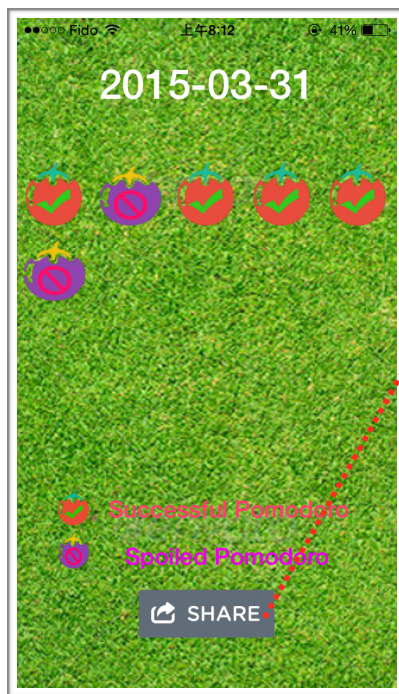


Successful Screen

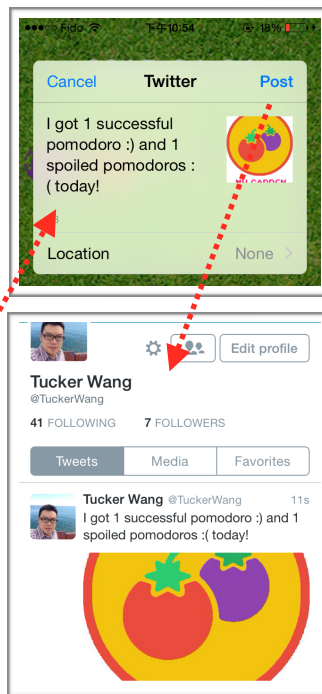
Failed Screen

After 25-minute study, an alert view will appear to congratulate the user on completing his study and he will get a successful pomodoro (red one). However, if the user chooses to give up during the process, he can shake the phone and a warning will pop up. If the user clicks Confirm, the program will be cleared and the user will get a spoiled pomodoro (purple one).





Garden Screen



Share to Social Media

The Garden is responsible for recording how many pomodoro a user gets in a single day. The user can swipe left or right to see previous day's achievement. The red one represents successful pomodoro and purple one represents failed pomodoro.

The user can also share his results to Twitter or Facebook to show his study efficiency to friends.

## 4. What did you learn - what would you do differently

### A. User feedbacks are valuable for iteration.

Feedbacks from every spiral presentation gave us inspiration for our next version. It reminded us that user experience and user test are essential to improve a mobile application.

### B. Improving the code's structure to make it easier to understand, maintain and extend over time.

Before implementation, system architecture is vital. It defines each subsystem's function and helps programmers to maintain and extend code over time. Otherwise, we have to revise every single line whenever we want to add or change functions.

### C. Spiral is good.

We started our project from two simple functions, Pomodoro Timer and Sitting Posture Detection. After that, we began to add more functions like Garden and Relaxing Breath into the project. Such a spiral implementation method helped us focus on a single



function each time so that we won't get distracted and frustrated. Therefore, comparing spiral method to waterfall method, we preferred the former one.

## 5. Contribution by Group Members

Fucntions	Pomodoro Timer	Sitting Posture Reminder	Relaxing Breath	Garden and Share
Lishuo Zhang (Apper)	<ul style="list-style-type: none"><li>Find articles and readings to figure out the answers for questions like how and why Pomodoro technique works, how many times a user need to breath in and out for relaxing their minds.</li><li>Designed the user interface, organised the information architecture, and improved Focus into a user-friendly app.</li><li>Designed the buttons and icons for the app, such as the logo, garden background image and pomodoro icons.</li></ul>			
Yang Wang (Programmer)	<ul style="list-style-type: none"><li>Implement multi-thread to ensure the accuracy of timer.</li></ul>	<ul style="list-style-type: none"><li>Used SDK for facial detection determine whether users have a good sitting posture by analysing facial features.</li></ul>		<ul style="list-style-type: none"><li>Connected local database with Twitter API to share user's data on social networks.</li></ul>
Xinyun Lv (Programmer)	<ul style="list-style-type: none"><li>Merged the 5-min break timer with the 25-min study timer together.</li></ul>		<ul style="list-style-type: none"><li>Used microphone to detect user's breathing and determined the frequency range of breathing.</li></ul>	<ul style="list-style-type: none"><li>Designed and implemented database to record user's pomodoro achievements.</li></ul>

## 6. Apper Projects: Apper Context

Before Focus, applications related to pomodoro technique commonly include a to-do list and a timer. It is a simple design, but such a design also has disadvantages. For example, it does not make sure that users are focusing on their assignments during 25-minute period, it does not trigger mobile phone's fully functionality, and it does not include any rewards or penalty system to encourage users. Focus changes such a flawed design.

First, Focus has a sitting posture detector. On one hand, it makes sure the user is sitting correctly because when sitting up straight, a person is more likely to remember positive memories or think of something positive in general(Cooper, 2015). On the other hand, it can prevent users to be distracted during study, because the phone will vibrate once the user leave the desk. Generally, people think mobile phones are distractions during study, but the design of Focus make phones into study helpers. It changes people's traditional concept. Phones are not harmful if we make them helpful. My favourite application for last year class is Baton, which changes phones from distractions for students in class into both teachers' and students' helpers. Therefore, I think more applications can be designed in this way in the near future.

Second, Focus encourages students to study, which previous applications don't do. Focus has a Garden where the user can share his results to social media. Expecting to get praises from friends, the user will try to get more pomodoro. In this way, it allows him to concentrate efforts on the activities and enhances personal effectiveness.

Finally, Focus has a relaxing breath function helping users to get prepared for what he is going to do. Such a function is not include in the field of other application. Since simple breathing exercises are good for immediate stress relief benefits(Mark, 2015), Focus can help user to relax and do a better job during study.

## 7. Future Work

Focus can be improved in the near future by adding the following functions:

- Add a to-do list to allow users plan their schedules.
- Create a dynamic and versatile interface that responds appropriately to different iPhones.
- Let users to skip preparations or disable facial detector if they want.

## 8. Let me know if OK to post video, report and/or source code on web (or not).

Yes, it is okay to post video, report and source code on web.

## 9. Reference

- (1) Kuznekoff, J. H. and Titsworth, S. (2013). The impact of mobile phone usage on student learning. *Communication Education*, 62 (3), 233-252.
- (2) Cirillo, Francesco. "The Pomodoro Technique (The Pomodoro)." *Agile Processes in Software Engineering* and 54.2 (2006).
- (3) Mark Sisson. "Deep Breathing: How and Why to Do It." *Marks Daily Apple RSS*. 16 Dec. 2010. Web. 31 Mar. 2015. <<http://www.marksdailyapple.com/deep-breathing/#axzz3VyVAuXnL>>
- (4) Cooper, Belle. "The Science of Posture: Sitting up Straight Will Make You Happier, More Confident and Less Risk-averse." *Buffer Social*. 11 Nov. 2013. Web. 31 Mar. 2015. <<https://blog.bufferapp.com/improve-posture-good-posture-science-happiness>>