Portfolio

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Section1: Demonstrate of core knowledge in Software Engineering and Human Computer Interaction

During my school career, I have completed many different software projects, in many different areas, with many different partners. By this procedure, I found that I can gain a lot of accomplishments when I finish the projects. Also, when I solved the problems in the project with/without my partners, I could gain a lot of enjoyment. Therefore, I decided to specialize in the Software Engineer area and be a qualified software engineer for my short term goal. For my long term goal, I want to be a project manager who knows how to manage the project efficiently and realize what my customers need. In this portfolio, I will demonstrate the core knowledge I learned by my projects from Software Engineer and Human Computer Interaction areas.

The main difference between software engineering and other engineering is that other engineering can not be modified at any time. For example, once the workers start building in architecture, they need to follow the blueprint until it is done. However, by following the Agile method, we can easily change the project's direction at any time. Two of the main rules of the Agile method (Scrum process) is daily scrum and Sprint. Daily scrum is a daily short meeting for each member to report their work and discuss goals and difficulties. A Sprint is a period of time for team members to develop certain parts of a product, and the team should be able to release a software product after every Sprint. In the project Catchee[1], we followed the Agile method and Scrum process for every Sprint. For each Sprint, we are ready to release the project with certain features such as login, radar, and bids. Source-code Control (SCC) and Test-driven development (TDD) are both important methods for developers to maintain the project. We implement SCC by using github so that every group member can clearly view the modification of the project. We implement TDD by using unit tests and integration tests. By doing unit tests, we can discover some unexpected bugs in each feature. For example, Catchee allows users to sign up and login, therefore, we need to make sure that the id for each user is correct under all situations. Therefore, for the PHP unit test, we use assertion to print the id. For the Javascript unit test, we use console.log() to print the id. By doing integration tests, we can make sure that there are no errors when integrating multiple functions. For example [1], we test if the pagination feature can integrate well with the search feature by checking if the output is the same as expected. At the end of the project, if we can provide a good Quality Assurance (QA) followed by the evidence, we can convince our stakeholder to invest or buy our products. There are many different Quality Attributes for developers to focus on. In Catchee, we have done many field studies, and we claim that our product has good usability followed by the evidence [2].

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[1] The idea of this project is we want to provide a selling platform for users who can easily find sellers near them. Therefore we provides the features such as search items, search the seller near you, a radar that can see the seller near you, bids, signup/log out (http://people.oregonstate.edu/~chenweij/CS561_Catchee/home.php)

Using UI design principles to create a friendly interface for all users is very important in software development. For example, in the project Improve AME App[2] on figure [4], our users may not know where to start the hearing test because there are other ambiguous options, and this violates the gulf of execution. Heuristic Evaluation is also a good method to test if the UI has good usability for any user. To do it, we will analyze the user's behavior based on different attributes. Here, we implement Heuristic Evaluation (include workflow, detailed evaluation) on AME based on GendarMeg. By doing workflow evaluation [3] and detailed evaluation [4], we know how different types of people interact with our AME App. For example, Abby, who has low motivation for technology, may keep using AME if she is comfortable with using it. On figure [4], Abby may not be able to tell where to start the hearing test.

Persona, which is a UI tool (like GendarMeg) helps developers understand their target users, is a good method to implement inclusive design. For example, in the project Improve Walmart Grocery App, we create Underserved Population Persona (low-income) and Mainstream population Persona based on the data we collect from many academic resources. By using these Personas, we can analyze their behavior and create a user interface which can take care of both underserved population and mainstreamers. Cognitive Walkthrough is a good method to evaluate a user's behavior. For example, the scenario [5] shows our low-income persona's goal, and we will select the corresponding attributes which are used in this case. Then we follow a step-by-step [6] action until our persona finishes the scenario. In the action, we analyze if the persona will do the right movement to achieve the goal, and after movement, we check if persona can tell if she is doing it correctly.

Section2: Demonstrate of the integration core knowledge with other field

Software Engineering can integrate with any other field as long as the project is related to software development. In fact, I had experience with integrating other fields of study in the project during a hackathon contest. In the contest, I invited two friends to join my team, one is a landscape design major and the other is an electrical engineering major. At that time, Taipei 101 set off fireworks every new year, however, it was not very recycled and caused a lot of pollution. Therefore, our idea was that we could use lighting shows instead of fireworks, and our project was demonstrating a Taipei 101 lighting show by using the models we create. In this project, my EE friend and I were in charge of the software development of arduino, and controlling the LED lights. My landscape design friend was in charge of designing the Taipei 101 plaza. In the end, we won third place in the hackathon contest. This example perfectly shows how people from different fields can successfully integrate their work together. However, after taking the class in

[2] Auto Modulation Equalizer is an App we make that can help users test their hearing ability. However, because this project didn't follow the UI design principles, it is hard for users to use the App.

the software engineering area, I know how to get this project done professionally by following software engineering methods.

First, even if we can plan carefully to avoid any mistakes, stakeholders may change the design in the middle of development. Therefore, I will choose to use the Agile method and Scrum process, instead of the Waterfall method. At the beginning of the project, I will recruit visual design specialists for designing the lighting shows. Based on the design, we will make a heavy weight prototype (like the project we made in hackathon), and show our work to the stakeholders during stakeholder review. After stakeholder review, we will discuss how to satisfy stakeholders during Sprint retrospective. For example [7], in the project Catchee, we invite many users to test our project, and some of them think because tokens on the map share the same image, they are not able to tell where they are. Based on the comment, we change the token's image in order to satisfy our users. Then we will repeat the step coding (based on the visual design), stakeholder review, and Sprint retrospective until the project is done, and this is how I can integrate visual design for a big event by following software engineering methods.

Software Engineering can also help integrate knowledge from other areas and develop a software product. Take AME for instance, we integrate the knowledge from otology, and we know that we can test our hearing ability by different frequencies. For example, for middle-age people, they should be able to hear around 14,000 Hz. If they can't hear the frequencies, they might need to check for their ear. Therefore, we design an App that can generate different frequencies through the earbud for users to test their hearing ability. For the UI design, we can use Mockup to create a minimum viable product (MVP). With this MVP, our user can interact with our product, and we can not only make sure we get every requirement, but also know if the user understands how to use our App. For example, on figure [8], it shows the workflow for AME App. By clicking on different buttons on the phone, it will lead users to the next picture, so that users can interact with our product. By discovering the user's behavior, developers can realize where they can make improvements for the App.

Section3: Demonstrate of effective communication skills

Communication is one of the key factors to success for software developers, and I have learned how to give a short but precise presentation for a group meeting. For example, in the Software Engineering Methods class, we are required to implement a ten minutes daily meeting (Daily Scrum) for all terms. During the meeting, each group member will share what he/she has done for the project, what difficulties he/she faced, and what his/her next goal is. Since every member is a busy graduate student, and does not have much free time to waste, the meeting needs to be done short and efficiently. By this meeting, I learned how to make a precise short talk by thinking about the key words beforehand, and hit it straight in the meeting. For example, in the project Catchee, I am mainly in charge of all front-end design. Therefore, for one meeting, I can announce that we will use Bootstrap for CS framework since we are making a Web App, and I have finished a prototype for the project. The next goal is to integrate other features in the UI. By efficient communication, each group member can clearly understand how the project is going, and can provide some help if anyone meets some problems and needs assistance.

Writing a good report for a software product is also important for attracting stakeholders, and I have learned how to write a solid and persuasive technical report. In the Software Engineering Methods class, we are required to write a report after every Sprint. In the report, we introduced what are the features in the project, we summarize the users' feedback, and we conclude what are the strengths/weaknesses of the project based on the users' feedback. In the end of the project, we claim that our project is compatible by showing the evidence. With clear points and strong support in the technical writing, we can easily communicate with our stakeholders and persuade them that our product is one of the best in the market.

Section4: Demonstrate of the ability to think critical about the ethical context

A common issue of computer ethics is intellectual property rights. Even if we know we should respect the author's intellectual property rights, sometimes we just forget or ignore it, even for a big company like Google. Genius.com, which is a website for searching lyrics, caught Google stealing their lyrics by putting Morse Code within the lyrics. So when the lyrics show up in google, it will be spelled redhanded, and present a red dot in the lyric page. Now Google is facing a fifty million lawsuit. This example perfectly shows that we should respect the copyright from other authors. As a software developer, I have a lot of opportunities to get involved in many open-resource projects. In this case, I must cite their reference and give the author credit. Aslo, I will spend a lot of time learning another engineer's work. If I want to modify other people's project and turn it to mine, I must get the author's approval first.

Section5: Create coherent professional goals

In this section, I will use SMART professional goals to set up my short term goal:

1. **Specific:** I will find a job in the software engineering field before Sep 13, 2020.
2. **Measurable:** I will use 2 hour per day to review the knowledge in the software engineering field and prepare for the interview, and I will apply for at least 10 jobs every day until I find a job.
3. **Attainable:** I will upload my projects and my portfolio to my personal website, Handshake, LinkedIn, and Indeed. Also, I will update all of my information on those job board websites.
4. **Relevant:** Other than just practicing professional techniques, I will practice my listening by watching English Ted talk and English YouTube videos.
5. **Time-Bound:** I will keep applying for jobs until Jun 13. Then I will start applying for volunteers until I get hired. After I get the volunteer job, I will apply for more jobs in the software engineering field before Sep 13, 2020.

In conclusion, my short term goal is to find a job after I graduate. To achieve the goal, I will try to finish the subgoals mentioned above everyday.

For my 5-year career goal, I want to be an expert in the software engineering field and be a Project Manager or senior engineer/salesman who is capable of doing business-to-business (B2B) transactions. To achieve my goal, I will accumulate more working experience and get familiar with the culture in different working environments. Also, I will hang out with my co-worker after work in order to practice my social techniques. I believe with this experience, I am prepared and educated enough to be a qualified Project Manager or senior engineer.

Section6: Appendix

4.2.2 Integration Testing

In this Sprint, we conducted Integration Testing and provide several cases of integration as follows:

Feature	Input	Expected Output	Status	Notes	Date
Pagination	Set 5 items per page	Pagination displays 1~N number of buttons (e.g. 10 items / 5 items per page = 1 2)	Success	N/A	11.20.2019
Pagination	Set 5 items per page	Each page shows 5 items	Success	N/A	11.21.2019
Pagination	Set 10 items per page	Each page shows 10 items	Success	N/A	11.21.2019
Pagination	Click on Pagination	Displays item from	Failed	Pagination	11.21.2019

[1] One example of integration tests; we integrate the code from different developers, and we test the code to see if the output is as expected.

Claims: An application that all users can use (**Usability**)

Evidence: The application requires minimal effort to do anything. For instance, Amazon requires users to contact sellers through e-mail, our application has chat pop-up between users.

Evaluation:

How to evaluate: Through User testing

Which Teammate Evaluate: Product Owner

Storage: Google Drive and Sprint Report

[2] One example of Quality Assurance; we provide a claim based on the evidence to show our product is better than our competitor.

4. WORKFLOW evaluation: What does each heuristic below

- Motivations

  Abby wants to have a hearing test and see if the scale shows that a problem with her hearing ability For **Abby**, after her first try, if she is comfortable using AME, she will keep using AME instead of other similar apps because she prefers using the same app for the same task.

  Tim wants to know how different hearing test results can lead to a different scale (see img) and suggested options (see img). For **Tim**, he may or may not use AME again because he likes to try new things. If he finds that another app is better than AME, he may use another app instead of AME.

  Pat is like **Abby** in some situations and like **Tim** in others.

[3] Workflow evaluation helps developers to analyze how different types of users interact with the product. This example shows that Tim, who has high motivation for technology, will interact differently with the product from Abby.

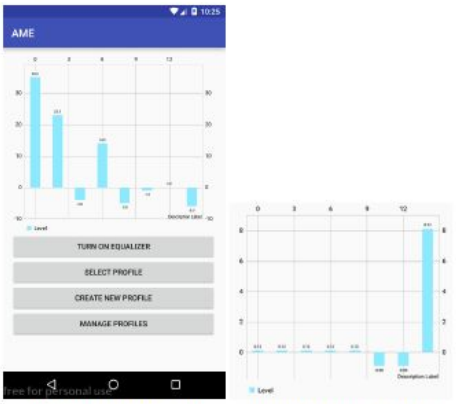
5. DETAILED evaluation:

Step # and screenshot:

Step 1: Open the AME app and tap "Create New Profile" button on main interface.

For the home page, there is no button that people can easily relate it to "Start hearing test". Instead, "Create New Profile" imply users that they can start the test from here.

Also, the upper part of the home page (see img 1.2) shows the result table of your hearing test, it shows the default value when you use the app first time. This is impossible for users to understand what the table means when they first use the app.(Track #1)



(a) Home (Track #2) (b) Upper part of Home

Figure 3: Home UI

- Motivations

  Abby, Tim and **Pat** want to take the hearing test, however, they cannot tell where they can start the hearing tests.(Track #3)

- Information-Processing Style

  Abby and **Pat** will review from the table to all four options while **Tim** will just click "create new profile" and start the test.

[4] Detailed evaluation helps developers to analyze what actions will different types of users do to finish the goal step by step. The figure shows that there are 4 buttons (turn on qualizer, select profile, create profile, and manage profile) in the homepage, but none of them are related to "start the hearing test". This may cause some users (Abby, Pat) to have trouble starting the test. But for other users (like Time), they can still figure out how to do it.

Senario (Overall Goal): Verona wants to prepare for shopping

Subgoal# 1 : Verona wants to check what is the events and what is available coupons. She also wants to download offline version for later use

1. Will<persona> have formed this subgoal as a step to their overall goal(scenario)?

✓ Yes	❑ Maybe	❑ No
Which ,if any, of <persona> facets did you use to answer the question?		
✓ Shopping Experience ✓ Attitude Toward Risk ❑ Attitude Toward Payment ✓ Access to Technology ✓ Device dependency and preference	❑ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference	❑ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference
Why? Verona has **less online shopping experience**, and she sometimes **doesn't like to learn new things**, because she thinks it might waste her time. Also, her personal device is a **low-price retail smartphone** that **doesn't have enough storage space**, because she **prefers not to buy an expensive and fancy smartphone**. She is **highly depend on her phone** because she doesn't have other devices such as Ipad or laptop.	Why?	Why?

[5] One example is our persona's(low-income) goal, and what attributes she needs to achieve this goal.

Action# 1: Click on “every” coupon and event or swipe left/right to see more, and once she is done, she will click start shopping

[Before Action] Will <persona> do this action? Why?

✓ Yes	❑ Maybe	❑ No
Which ,if any, of <persona> facets did you use to answer the question?		
✓ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference	❑ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference	❑ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference
Why? Because she wants to save Money, she won't miss any information of coupon and events.	Why?	Why?

[AFTER ACTION] If does the right thing, will they know that they did the right thing and is making progress toward their goal? Why?

✓ Yes	❑ Maybe	❑ No
Which ,if any, of <persona> facets did you use to answer the question?		
✓ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference	❑ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference	❑ Shopping Experience ❑ Attitude Toward Risk ❑ Attitude Toward Payment ❑ Access to Technology ❑ Device dependency and preference
Why? Because after she browsing Every in formation, the only button she can click on that page is :start shopping". There is no where else she can go.	Why?	Why?

[6] One of the steps our persona(low-income) uses to achieve her goal. The information includes 2 core knowledge of HCI: does she know how to do it (to finish the goal), and does she know if she does it right.

4.3 Sprint Review with Users

First User Fatema Al Nuaimi:

- **Weakness**

  Users' token and sellers' token share the same image. That may make user confuse which token is his/her.

- **Strength**

  Because there are only name tag and price tag on the token, it makes interface on the map is clean and easy to understand the information on it.

- **Feedback**

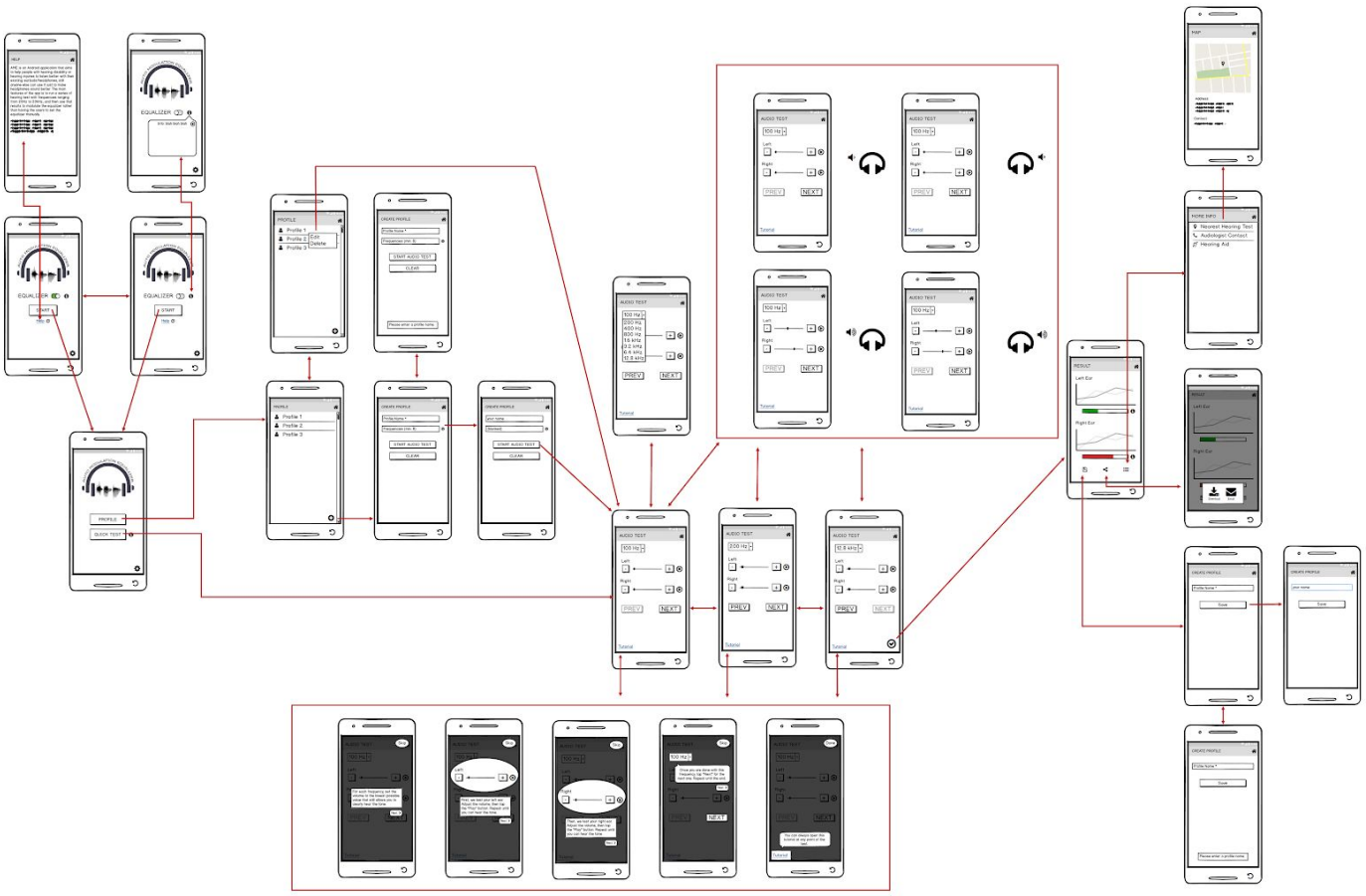
  In the map, all tokens are all stuck together, i need to zoom in to see which tokens represent me. Also, it will be great if it can show me how to get to the seller, like a gps or something. But this is a good design, i like it tho :).

[7] an user’s feedback from Sprint Review

Auto Modulation Equalizer

Reem Abuarafah, Wei-Jen Chen and Yi Xuan Chia

Oregon State University



[8] the mockup workflow for AME App

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This is to certify that:

Wei Jen Chen

Has completed the following CITI Program course:

Responsible Conduct of Research (Curriculum Group)
Responsible Conduct of Research for Engineers (Course Learner Group)
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[9] CITI Ethics Certificate

Transfer Symbol	G*	Title of Major Courses	Course		Cr.	Gr.
			Dept.	No.		
	G	THEORY OF COMPUTATION	cs	517	4	A-
	G	DATABASE MANAGEMENT SYSTEMS	cs	540	4	B-
	G	SOFTWARE ENGINEERING METHODS	cs	561	4	B+
	G	SOFTWARE PROJECT MANAGEMENT	cs	562	4	A-
	G	HUMAN-COMPUTER INTERACTION	cs	565	4	B+
	G	LAB STUDIES IN SE AND HCI	cs	567	4	B-
		ST/CYBER ATTACKS & DEFENSE	cs	519	4	B-
		INCLUSIVE DESIGN (HCI)	cs	568	4	A
		INTRO TO PARALLEL PROGRAMMING	cs	575	4	A
		ADVANCED COMPUTER NETWORKING	cs	576	4	B
		ST/INTRO TO INFO VISUALIZATION	cs	519	4	

[10] My Program of Study