CMPT 275

Assignment 2A – Requirements Document
User Manual
By Team X

Project Group #10

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Project Website

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Table of Contents

0. Revision History

Revision	Status	Date	By
1.0	Template of Requirements Document	September 26, 2017	Aaron
2.0	Brainstormed functional requirements, added Introduction	October 1st, 2017	All
3.0	feature/functional requirements, audience List	October 5rd, 2017	Peter, Jerry, Ivana
4.0	Non-functional requirements, Tutorial and glossary	October 10th, 2017	Shayne, Peter, Aaron
5.0	Finalized Document	October 17th, 2017	All
6.0	Version 1 Revision	Nov 3rd, 2017	All
7.0	Version 2 Revision	Nov 19th, 2017	All

Table 1: *Revision History*

1. Introduction

Autism Spectrum Disorder (also known as ASD) is a complex developmental disability often characterized by issues in communication (both verbal and nonverbal), repetitive behaviours and social challenges [1]. Autism is a spectrum disorder, meaning it has different severity levels and effects patients in different ways.

We are creating The Personal Emotion Trainer (P.E.T.); an iOS mobile application that is designed to develop emotion cognitive abilities for people diagnosed with Autism Spectrum Disorder. Studies [2, 3] suggest evidence for poor recognition of emotions from facial expression among autistic patients. This can cause difficulties in social interactions, maintaining relationships and even employment [4]. Some tools that were suggested to help teach children included emotion cards, a set of cards with different facial expressions, and several DVDs which use characters to teach emotions [2, 5]. As a behavioural training program, this application is designed to teach the fundamentals of facial expressions and the emotions behind those expressions through the mobile device. It will help patients with autism to better understand and identify emotions and therefore improve their social behaviour.

This requirements document will outline the intended audience, feature and functional requirements, and non-functional requirements of P.E.T., as well as briefly showcase some of the core mechanics of the application.

2. Intended Audience List

The intended audience list for the Personal Emotion Trainer includes both patients living with ASD (primary users) and their caretakers (secondary users). However, the use of the application will be different for each user group.

1. ASD patients will be able to use P.E.T as a fun and educational tool to help them understand human emotions and social norms. The target audience for ASD is people on the low to mid half of the spectrum, ranging between the ages of 5 to 12. User are assumed to have some previous experience with social interaction but struggles with it due to their inability to understand the emotions others are conveying, resulting in a lack of cognitive empathy, which many people living with ASD are found to be lacking [1]. Further, user are assumed to have a goal to better their emotional understanding in order to improve their social abilities and interactions, which is why they will be using the P.E.T application. Some additional assumptions regarding our ASD patient users:
   a. Users will be able to navigate through a mobile device or tablet. Management and installation of the software can be done by the user's guardians or caregivers if the user is unable to set up the P.E.T application.
   b. Users will have a basic understanding of simple text and pictures.
   c. Users will not be hearing or visually impaired. However, if the user is illiterate, accommodation will be provided such as text to voice instructions.

2. Caretaker's and doctors of ASD patients are the second target audience for the P.E.T. As the primary users play the game and identify various emotions shown to them at each level of the game, the application will gather data of what questions were answered correctly and incorrectly. By gathering this, the application will provide caretakers and doctors with both local and global statistics. Local stats will be provided for a single user, which will allow their caretakers to monitor their progress and identify which emotions they find more difficult to understand, so that they can modify their caretaking to help the patient accordingly. Global statistics will be provided for all users, and provide additional information to doctors and researchers who may be monitoring the common effects of ASD. It is possible that the P.E.T will identify certain emotions and norms that are difficult for many patients to identify, and this information may help research efforts for treatment of the disease.

The caregivers and doctors will not access the application in the same way as the ASD patients who are playing the game. Caregivers will be able to monitor local statistics on the individual patient's application, while global statistics will be provided to medical research online through our web site. Our assumptions for the secondary users of P.E.T are as follows:

        a. Caregivers will have access to the patient's mobile device to view the local statistics on the application.
        b. Doctors and research analysts will monitor the global statistics provided and use them to improve the wellbeing of ASD patients.

3. Features/Functional Requirements

This section discusses the details of the major modules and functionality of the P.E.T application. The features/functions are displayed as scenario-based use cases to showcase purpose, priority, and associated functions.

3.1 Account Authentication System

Use case:	Login to the game by the "login screen"
Primary actor:	Player, Parent or Guardian
Goal in context:	To authenticate the username and password with the remote database.
Preconditions:	Player have already created account with valid username and password.
Trigger	The player decides to open the application

Scenario:
1. The player enters their username (or email) and password on the login screen under the labeled text boxes.
2. The player presses the "login" button on the login screen.
3. Credential is searched on the database for a match.
4. If the username and the password match those in the database the user is taken to the "main menu".

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message, "There is no connection to the network"
2. The username (or email) exists in the database but the password is incorrect. The player is given the message, "The password is incorrect. Please try again"
3. The username (or email) doesn't exist in the database. The player is given the message, "<username> doesn't exist. Please check the username or create a new account"

Priority: Priority 1

Version available:	Version 1
Frequency of use:	Frequent
Secondary actors:	Remote Database

Channels to secondary actors: Internet connection

Open Issues:
1. What is the response time for logging over the network?
2. How many attempts will the player be able to input?

Use case:	Create an account
Primary actor:	Player, Parent or Guardian
Goal in context:	To create an account so the player can login to the game.
Preconditions:	A player must not already created an account in the database
Trigger	The player decides to play the game and has not created an account yet.

Scenario:
1. The player presses the "create account" button on the login screen.
2. The game displays the "create account" screen.
3. The player enters their user information: full name, age, gender.
4. The player enters their account information: username, email.
5. The player enters the password and confirm password.
6. If player presses the "create account" button.
7. If player presses the "Cancel" button to return to the "login" screen.

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message, "There is no connection to the network"
2. The player mistakenly pressed the "create account" button on the login screen. The player presses the "cancel" button on the "create account" screen and is taken to the login screen.
3. The username already exists in the database. The user is prompted to input a different username. This can repeat until the username is unique to the database.
4. Any of the fields are blank or invalid when the user presses the "Create" button. The user is given an error message.

Priority: Priority 1

Version available:	Version 1
Frequency of use:	Infrequent
Secondary actors:	System Admin

Channels to secondary actors: Internet connection

Open Issue:
1. What is the response time of adding an account to the server?
2. How are duplicate accounts handled?

3.2 Game Configuration Option

Use case:	Configure the settings
Primary actor:	Player, Parent or Guardian
Goal in context:	To configure the volume, enable voice narration, reset progression
Preconditions:	A player must be logged into the game
Trigger	The player wishes configure game settings, and logged in to the game

Scenario:
1. The player logs into the game successfully
2. The player presses the "Settings" button on the "Main menu" screen and is taken to the "Settings" screen
3. To increase the volume, the player presses the "+" button to increase the volume in increments of 5%. The maximum volume is 100%.
4. To decrease the volume, the player presses the "-" button to decrease the volume in increments of 5%. The minimum volume is 25%.
5. To enable or disable voice narration for question prompt, player presses the enable or disable box under "Voice Narration"
6. To enable or disable sound feedback, player presses the enable or disable box under "Sound Feedback"
7. To reset gameplay progress player presses the "Reset Progress" button and progress will be reset.
8. To change account information, the user presses the "Edit Account" button
9. The player presses the "Main Menu" button to return to the "Main Menu"

Exceptions: N/A
Priority: Priority 1

Version available:	Version 2
Frequency of use:	Infrequent
Secondary actors:	N/A

Channels to secondary actors: N/A
Open Issues: N/A

3.3 Database - User Statistics

Use case:	Review gameplay statistics
Primary actor:	Parent or Guardian, Player
Goal in context:	Allow the player or a parent/Guardian to review the player's gameplay statistics and analysis of those statistics
Preconditions:	A player must be logged into the game
Trigger	The player presses the "Review Gameplay" button on the Main Menu

Scenario:
1. The player presses the "Review Gameplay" button on the "Main menu" button.
2. The player is taken to the "Review Gameplay" screen.
3. The player reviews the analysis of their correct and incorrect answers.
4. The player reviews the analysis of their levels played and completed.
5. The player reviews the number of skips, and tips used.
6. The player reviews the time spent on each question.
7. The player reviews the total time spent in app.
8. All statistics will be presented in easy to understand graphs.
9. The player presses the "Main menu" button to return to the "Main menu" screen.

Exceptions:
1. The player has yet to play the game one time.
2. A connection to the network doesn't exist. The player is given an error message, "There is no connection to the network".

Priority: Priority 1

Version available:	Version 3
Frequency of use:	Frequent
Secondary actors:	Remote Database, Local Database

Channels to secondary actors: Internet connection

Open Issues: N/A

3.4 Custom Question Maker

Use case:	Create a new customized question
Primary actor:	Parent or Guardian, Player
Goal in context:	Allow users to create new questions not part of the standard game. Customized questions are stored into the Question Bank.
Preconditions:	A player must be logged into the game
Trigger	The player presses the "Create question" button from the "Question Managers" screen.

Scenario:
1. The player presses the "Question Manager" button on the main menu and is taken to the "Question Manager" screen.
2. The "Question Manager" screen will be a page with a list of user-created questions. If no questions are created the list is empty
3. The player presses the "Create Question" button on the "Question Manager" screen and is taken to the "Create Question" screen.
4. On the "Create Question" screen the user enters the "Question Prompt", "Answer", and uploads an image file with the intended emotion.
5. The player presses the "Create Question" button to create the question.
6. The question is then added to the list under "Question Manager" screen.
7. The player presses the "Main Menu" button from the "Question Manager" screen to return to the "Main menu".

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message, "There is no connection to the network" and the player is returned to the "Login" screen.
2. No image is uploaded from photo gallery or camera.
3. No question prompt and or answer inputted.

Priority: Priority 1

Version available:	Version 2
Frequency of use:	Frequent
Secondary actors:	N/A

Channels to secondary actors: N/A
Open Issues: N/A

Use case:	Edit an existing customized question
Primary actor:	Parent or Guardian, Player
Goal in context:	Allow the parent/guardian or player to edit existing questions from the Question Bank.
Preconditions:	A player must be logged into the game.
Trigger	The player presses the "Edit question" button on the "Question Managers" screen.

Scenario:
1. The player presses the "Question Manager" button on the "Main menu" screen and is taken to the "Question Manager" screen.
2. The "Question Manager" screen will be a page with a list of user-created questions. If no questions are created the list is empty.
3. The player presses the "Edit question" button on the "Question Manager" screen and select the question they want to edit and will be taken to the "Questions Editor" screen
4. On the "Questions Editor" screen the player can then edit the question prompt, answer, and or re-upload an image.
5. When the player is done editing the question, the player presses the "Save Question" button. Then is returned to the "Question Manager" screen.
6. The player presses the "Main Menu" button from the "Question Manager" screen to return to the "Main menu".

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message, "There is no connection to the network" and the player is returned to the "Login" screen.
2. The player hasn't created any questions. The player is given an error message, "There are no custom questions to edit" and then returns the player to the "Question Manager" screen.

Priority: Priority 1

Version available:	Version 2
Frequency of use:	Infrequent
Secondary actors:	Remote Database

Channels to secondary actors: Internet Connection

Open Issues: N/A

Use case:	Delete an existing customized question
Primary actor:	Parent or Guardian, Player
Goal in context:	Allow the parent/Guardian or player to delete a custom question from the Question Bank
Preconditions:	A player must be logged into the game
Trigger	The player presses the "Edit questions" button on the "Question Managers" screen.

Scenario:
1. The player presses the "Question Manager" button on the "Main menu" screen and is taken to the "Question Manager" screen.
2. On the "Question Manager" screen there is a list of questions created by the player.
3. The player presses the trashcan icon next to one of the questions in the list.
4. The player is given a prompt, "Are you sure you want to delete this question?"
5. If the player presses the "Yes" button, the question is delete and the player returns to the "Question Manager" screen.
6. If the player presses the "No" button, the question is not delete and the player returns to the "Question Manager" screen.
7. The player presses the "Main Menu" button from the "Question Manager" screen to return to the "Main menu".

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message, "There is no connection to the network" and the player is returned to the "Login" screen.
2. The player hasn't created any questions. The player is given an error message, "There are no custom questions to edit" and then returns the player to the "Question Manager" screen.

Priority: Priority 1

Version available:	Version 2
Frequency of use:	Infrequent
Secondary actors:	Remote Database

Channels to secondary actors: Internet Connection

Open Issues: N/A

3.5 Tutorial

Use case:	Player to learn gameplay mechanics from the Tutorial
Primary actor:	Player
Goal in context:	Player will learn to navigate the game and understand gameplay
Preconditions:	Player is logged in - front facing camera is accessible
Trigger	Player select "Tutorial" button from the main menu

Scenario:
1. Player select the "Tutorial" button on the "Main menu" screen.
2. Player will be presented with the first page of "Tutorial" displaying text and image guide on how to start a round game.
3. Voice narration will be played reading out the text guide.
4. Play either press next button or swipe right to be taken to the next tutorial page. If player is at page 9 swiping right does nothing.
5. Pressing previous button or swipe left to be taken to previous tutorial page. If player is at page 1 swiping left does nothing.
6. Page 2 will teach player on how to answer a question with text and image guide.
7. Page 3 will show what if the incorrect answer selected with text and image guide.
8. Page 4 will show what if the correct answer selected with text and image guide.
9. Page 5 will show how to access the "Question Manager" screens.
10. Page 6 will show how to create, edit and delete custom questions.
11. Page 7 will show how to play questions made from the Question Bank.
12. Page 8 will show how to access the Emotion API levels.
13. Page 9 will show how to play the Emotion API levels
14. Pressing the "return" button from any of the "Tutorial" screen to return to the "Main menu".

Exceptions: N/A

Priority: Priority 2

Version available:	Versions 1
Frequency of use:	Infrequent
Secondary actors:	N/A

Channels to secondary actors: N/A

Open Issues: N/A

3.6 Gameplay - Standard Questions

Use case:	Play single or multiple rounds of the game
Primary actor:	Player
Goal in context:	Player will be given a question to answer
Preconditions:	A player must be logged into the game
Trigger	The player presses the "Play" button on the "Main menu" screen.

Scenario:
1. The player presses the "Play" button on the "Main menu" screen and is taken to the level selection screen. 2. Selecting a level the player will be presented with the main gameplay screen. 3. A picture of a scenario is shown to the player on the left half side of the screen. 4. Between 2 and 3 seconds later, narrator reads question prompt associated with picture. 5. As the narrator is reading the question, the right half of the screen displays a menu of 3 to 5 possible answers (number of choices is based on level chosen) 6. The player has an unlimited amount of time to answer the question. 7. If the incorrect answer is chosen an indication message will play, the button is grey out and disabled. 8. The player is given another chance to answer. After all incorrect choices are select the correct answer is highlighted. Then the next question is shown. 9. If the correct answer is chosen, the narrator responds "correct" and the correct answer is highlighted and the next question is shown. 10. The player presses the "Menu" button from the "Gameplay" screen and select "Main Menu" to return to the "Main menu".

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message and player is returned to the "Login" screen.

Priority: Priority 1

Version available:	Version 1
Frequency of use:	Frequent
Secondary actors:	N/A

Channels to secondary actors: N/A

Open Issues: N/A

3.7 Gameplay - Custom Questions

Use case:	Play single or multiple rounds of the custom-made questions
Primary actor:	Player
Goal in context:	Player will be given custom made questions to answer
Preconditions:	A player must be logged into the game
Trigger	The player presses the "Question Bank" button on the "Level selection" screen.

Scenario:
1. The player presses the "Question Bank" button on the "Level selection" screen.
2. Selecting a level the player will be presented with the main gameplay screen.
3. A picture of a scenario uploaded by user is shown on the left half side of the screen.
4. The right half of the screen displays a menu of 3 to 5 possible answers (number of choices is based on level chosen)
5. The player has an unlimited amount of time to answer the question.
6. If the incorrect answer is chosen an indication message will play, the button is grey out and disabled.
7. The player is given another chance to answer.
8. If all incorrect choices are select the question the correct answer will be highlighted, then next question is shown.
9. If the correct answer is chosen (user made), the narrator responds "correct" and the correct answer is highlighted.
10. The player presses the "Menu" button from the "Gameplay" screen and select "Main Menu" to return to the "Main menu".

Exceptions:
1. No questions are available in the Question Bank.

Priority: Priority 1

Version available:	Version 1
Frequency of use:	Frequent
Secondary actors:	N/A

Channels to secondary actors: N/A

Open Issues: N/A

3.8 Gameplay - Emotion Recognition API Questions

Use case:	Play one or multiple round of Facial Fun Levels
Primary actor:	Player
Goal in context:	Player will play with facial recognition API integrated questions
Preconditions:	Player is logged in - front facing camera is accessible
Trigger	Player selects "Facial Fun Levels" in level selection

Scenario:
1. Player select the "Play" button on the main menu and taken to the "Level Selection" screen.
2. Player selects "Facial Fun Levels" button and is taken to the Facial Fun gameplay screen.
3. Player is shown a picture of one of the supported facial expressions recognizable to the API.
4. The Player is shown a live image of their own face by the front facing camera.
5. Player forms the expression, shown earlier, while watching the live image of their face. Then clicks the screen when they have formed the expression.
6. If the Player has formed the expression correctly, the player
7. If the Player did not perform the expression correctly, the player is given another chance.
8. The player can exit the game at any time by pressing the "Done" button.

Exceptions:
1. A connection to the network doesn't exist. The player is given an error message and the player is returned to the "Login" screen.
2. No camera is detected on the device, user is given a prompt asking for permission to access camera.

Priority: Priority 1

Version available:	Version 3
Frequency of use:	Frequent
Secondary actors:	Affectiva/Azura Emotion API

Channels to secondary actors: N/A

Open Issues:
1. What will be the response time of the API?
2. How many facial expressions are recognizable by the API?

4. Non-Functional Requirements

These are the non-functional requirements for the P.E.T. application. Requirements in a type take precedence when conflicting requirements also appear in a SuperType. To reduce ambiguity, each type can have only one SuperType.

4.1 Graphical User Interface Elements

Type:	Screen (view controller)
SuperType:	GUI
Description:	How the layout is displayed on the Screen

Requirements:
- The application is only support IOS tablets with a resolution of 1366x1024.
- The application maintains a landscape aspect ratio. Rotating the screen will not cause the aspect ratio to change to portrait.
- The application's layout will fill the entire screen but not obscure any system-wide status bars.
- The application's user interface will not interfere with any system-wide screen edge gestures

Type:	Text Box
SuperType:	GUI
Description	Text boxes used to hold text put into the database

Requirements:
- Text boxes will have a one or two word descriptive label placed above, within, or on the left of the text box.
- Labels for text boxes will use a bold font style
- For text boxes that contain information that will be put into the database, when the data doesn't meet the specific requirement:
    - It will be displayed in red 1 second after the last character is entered.
    - A descriptive text message will be displayed below the textbox with a definition of the requirement
- Font size: 24, 36

Type:	Buttons
SuperType:	GUI
Description:	Buttons will be used to represent menu choices and actions that the player can perform.

Requirements:
- Font style: Bold
- Font size: 24, 36
- The button text for menu items will be the name of the screen it opens.
- The button text for actions will be a one or two word short description of the action it performs.
- Disabled buttons will be greyed out and unresponsive.
- When a player presses a button, it will highlight for 250ms to give visual feedback that the button was pressed
- When a player presses a button, it will make a sound that lasts not longer than 500ms to give auditory feedback the button was pressed.

Type:	Checkboxes
SuperType:	GUI
Description:	Checkboxes are used to show when a particular feature is enabled

Requirements:
- Labels for checkboxes are one to ten words.
- Descriptions must describe the state of the feature when it is enabled
- A check in the box or box is filled with a color means that feature is enabled.

Type:	Images
SuperType:	GUI
Description:	Images uploaded by the user and image assets used in app

Requirements:
- Acceptable file formats are jpg or jpeg, png
- Maximum file size in Kbytes is 2000
- Image will be cropped to a square within dimensions of 600x600
- Images must be in good clarity
- Images must be appropriate, there will be no explicit or offensive materials used for the image prompts.

4.2 Network, Database and Security

Type:	Security
SuperType:	None
Description:	Encryption and Security of Data

Requirements:
- Users must be required to login using their username and password after opening the application.
- Username and password for all user accounts must be secured and protected on the online database.
- User will automatically log out of the app after 30 minutes of inactivity.
- User will be required to log back in the app after logging out.
- Password text boxes will not display the actual characters of the password. Instead any characters typed or displayed in a password text box will use an asterisk in place of each character.

Type:	Authentication
SuperType:	None
Description:	Authentication of users with the database

Requirements:
- Authentication of a player should take no more than 30 seconds
- After 3 consecutive failures to login with an incorrect username and/or password, the player will be denied attempts to log in for 1 minute. The "Login" button on the "Login screen will be disabled. After 1 minute the user may attempt to log in again and the "Login" button will be enabled.
- If authentication of a player takes longer than 30 seconds, the authentication attempt will timeout. An error message, "User authentication timed out, try again".

Type:	Database
SuperType:	None
Description:	How transactions with the database are handled

Requirements:
- Transactions to and from the tablet to database will timeout after 3 minute
- Database must be available for transactions at all times
- Connection to database must require an internet connection

4.3 Operating System

Type:	Operating System
SuperType:	None
Description:	The requirement for operating systems that the app will run on

Requirements:
- P.E.T. should run on iOS devices running iOS version 9.X and above.
- IOS devices that are compatible should be iPad, and iPad pro.
- The device should have a working camera
- The operating system must have 1GB of RAM available
- The operating system must have at least 800Mb of memory available when downloading the application
- The operating system must have Apple A8 GPU or above

Type:	Action Time
SuperType:	Operating System
Description:	Time it will take the app perform certain actions

Requirements:
- Startup time of the application should be at most 10 seconds.
- Login credential authentication should be at most 15 seconds.
- Transactions between pages should be at most 1 seconds.
- Response to answer selection should be at most 1 seconds.
- Question narration will replay after 30 seconds.

Type:	Energy and Battery Usage
SuperType:	Operating System
Description:	Amount of battery consume with application is running

Requirements:
- The application must not consume 100% of battery after 2 hours of usage.
- Application will not take priority over other task that the devices is performing.
- Application will run in background with not in use.
- Application will reduce network usage when not in use to prevent battery drain.
- Application will be as idle as possible to avoid waking the device with activities unless absolutely necessary.

4.4 Gameplay

Type:	Questions
SuperType:	None
Description	How the application presents questions to the player and how the application responds when the player answers questions

Requirement:
- All question prompts will be read to the player using the iOS text to speech (TTS) API
- When the correct answer is chosen, a correct sound indication and message prompt is played for no more than 2 seconds.
- When the incorrect answer is chosen, an incorrect sound indication and message prompt is played for no more than 2 seconds.
- When the incorrect answer is chosen, the button is greyed out and disabled. User will not be able to interact with disabled buttons
- If all incorrect answers are chosen, the question is skipped automatically.
- After a question is skipped it will be shuffled into the back of the order of questions. Once the play has gone through all questions they will be present with the skipped question once again with all buttons enabled.
- There is no time limit for answering questions.
- After 30 seconds with no answer selection the narration will replay.
- Tips will give additional context to the question images.

5. Tutorials & Gameplay Scenarios

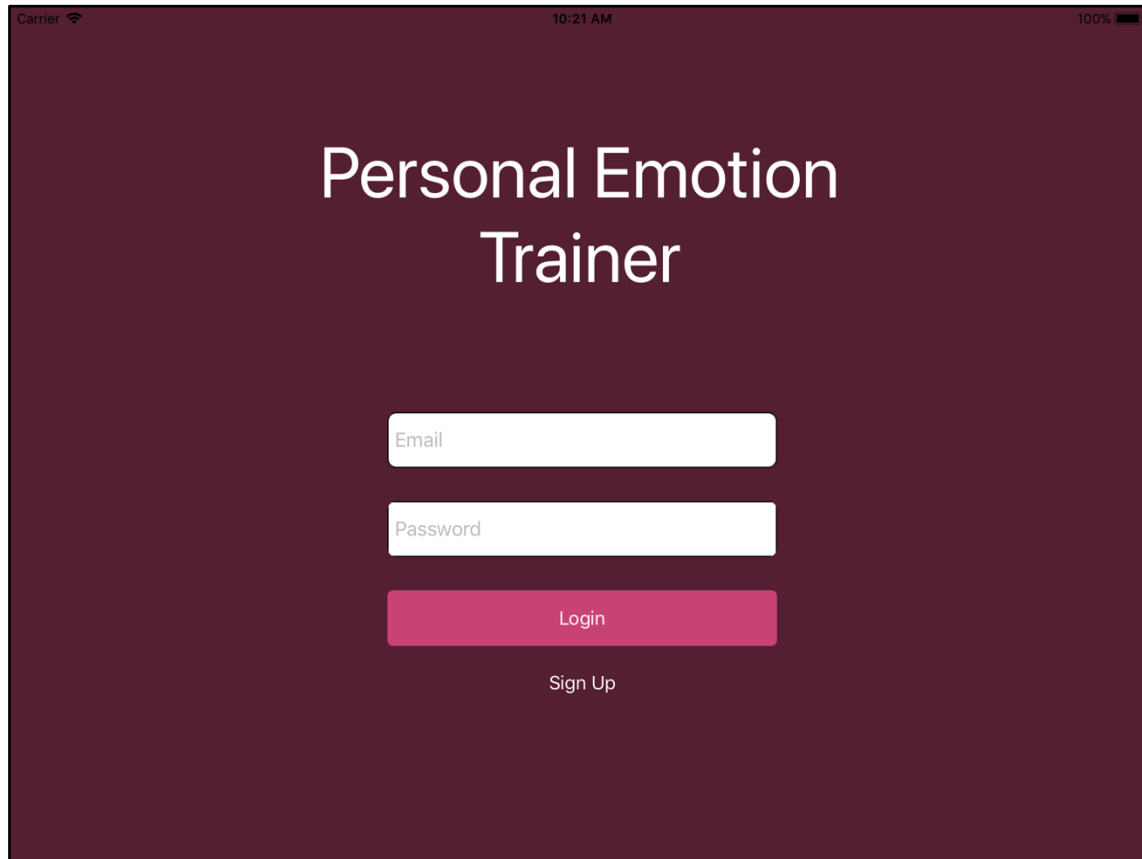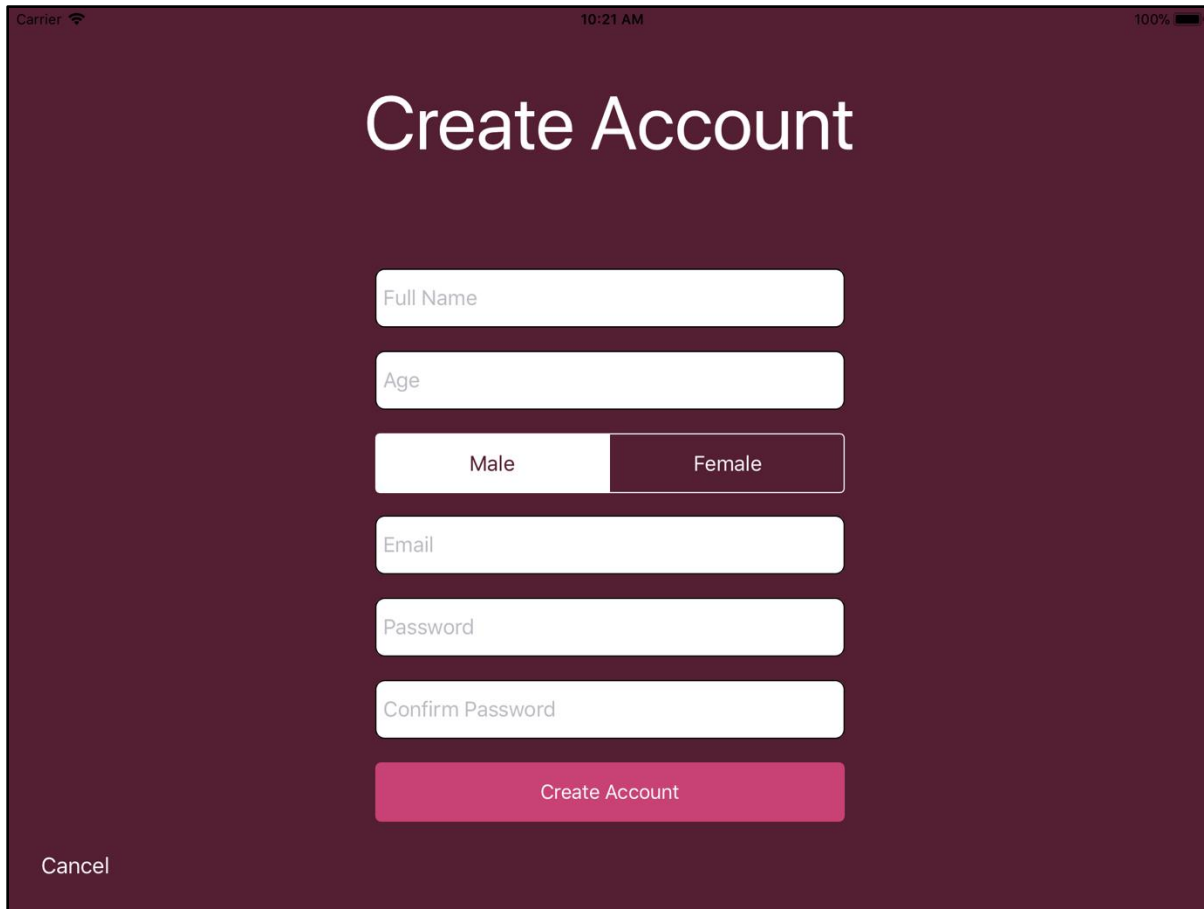## 5.1 Scenario 1: Initial launch of application

Figure 1 - *Homepage Page*

Description	On start of application, the user will be greeted with the login screen. In the login screen, the user will be asked to login with existing credentials or create new credentials. Before the user can play the game, the user must create an account on the game server in order to save progression. **Login** - If the user enters correct username with matching password, they will be redirected to the main menu (Scenario 3a). **Sign Up** - If the user request for account creation, they will be redirect to the account creation screen (scenario 2).

Action	A) User select any empty text field.
	    a) Touch screen keyboard will pop up for input of text.
	B) User select buttons to create account or return to login screen.
	    a) User will be redirect to selected page.

5.2 Scenario 2: Account Creation

Figure 2 - *Account Creation*

Description	This is the account creation screen. Here the user will enter personal information and account information. If user entered information according to its precise definition, along with a unique username and email, and the password matches the password confirm, an account will be created and user will be brought to the Main Menu (Scenario 3a). If user decide to cancel account creation they will be returned to login screen (Scenario 1).

Action	A) User select any empty text field
	    a) Touch screen keyboard will pop for input of text.
	    b) Once all entries are entered correctly user selecting create account will create an account on the database.
	B) User select buttons to "Create Account" or "Cancel" to return to login screen.
	    a) User will be redirect to "Create Account" page.
	    b) User will be redirect to "Login" page.

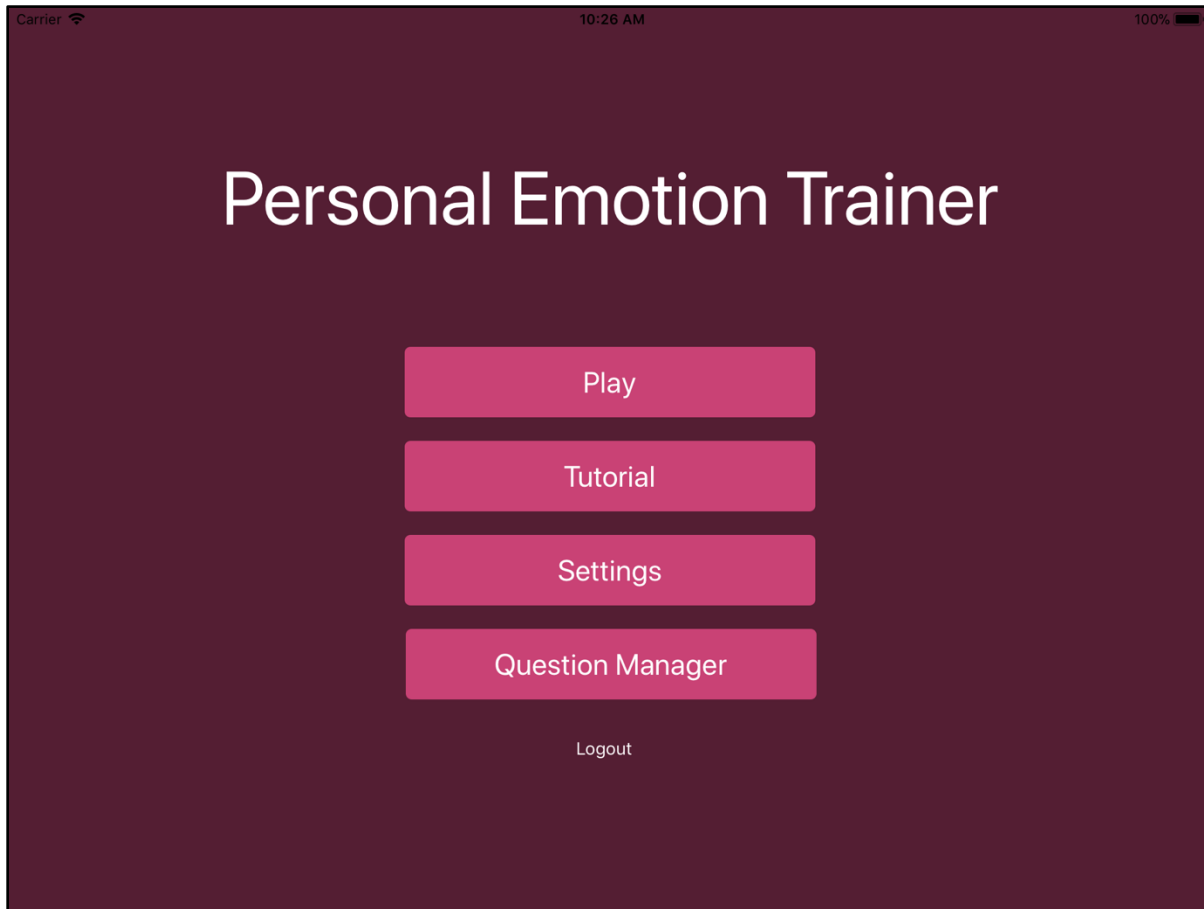**5.3.1 Scenario 3a: Navigation - Main Menu**

Figure 3 - *Homepage*

Description	After the login, user will be presented with the homepage of the application. This is the main navigation control page for the application. From here the user can access specific screens listed below. **Play** - The user will be redirected to the level selection screen to select level and start playing (Scenario 3b). **Tutorial** - User will be provided with a walkthrough of different gameplay scenarios. This will be a set of animated slides with voiceover narration guiding the user. **Settings -** User will be able to change configuration of the game. **Question Manager**- User will be redirect to Question Manager. **Logout** - User will be redirect to login screen (Scenario 1).
Action	Selecting the menu buttons will redirect user to selected screen.

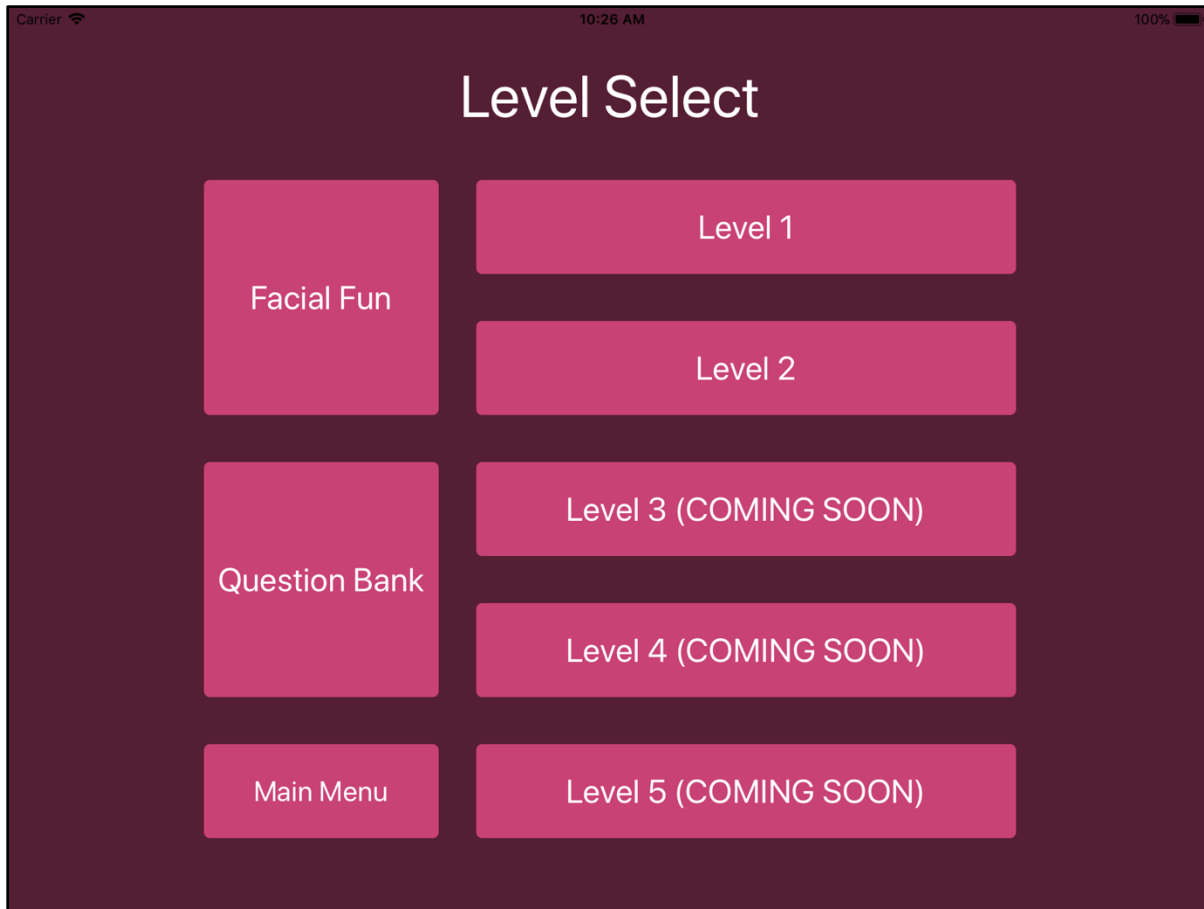**Scenario 3b: Navigation - Level Selection**

Figure 4 - *Level Selection*

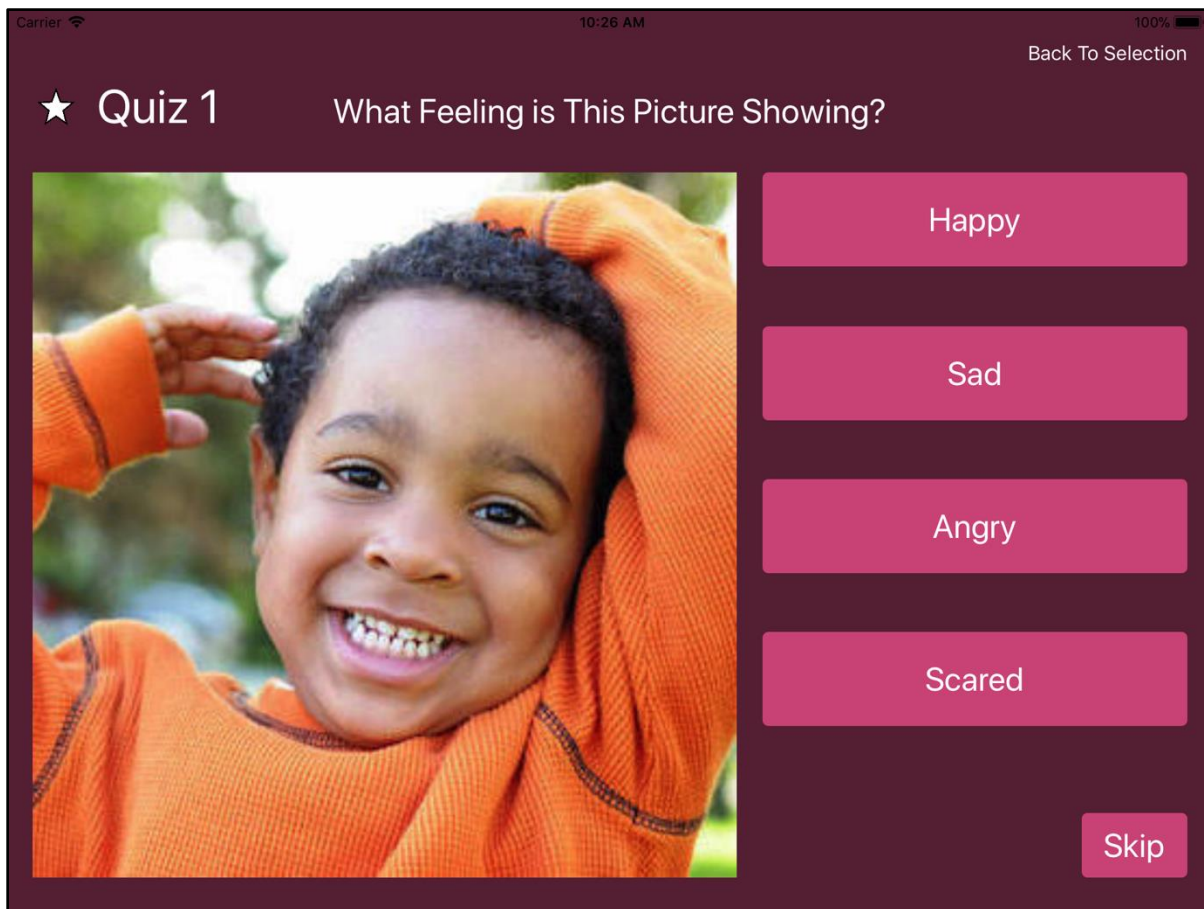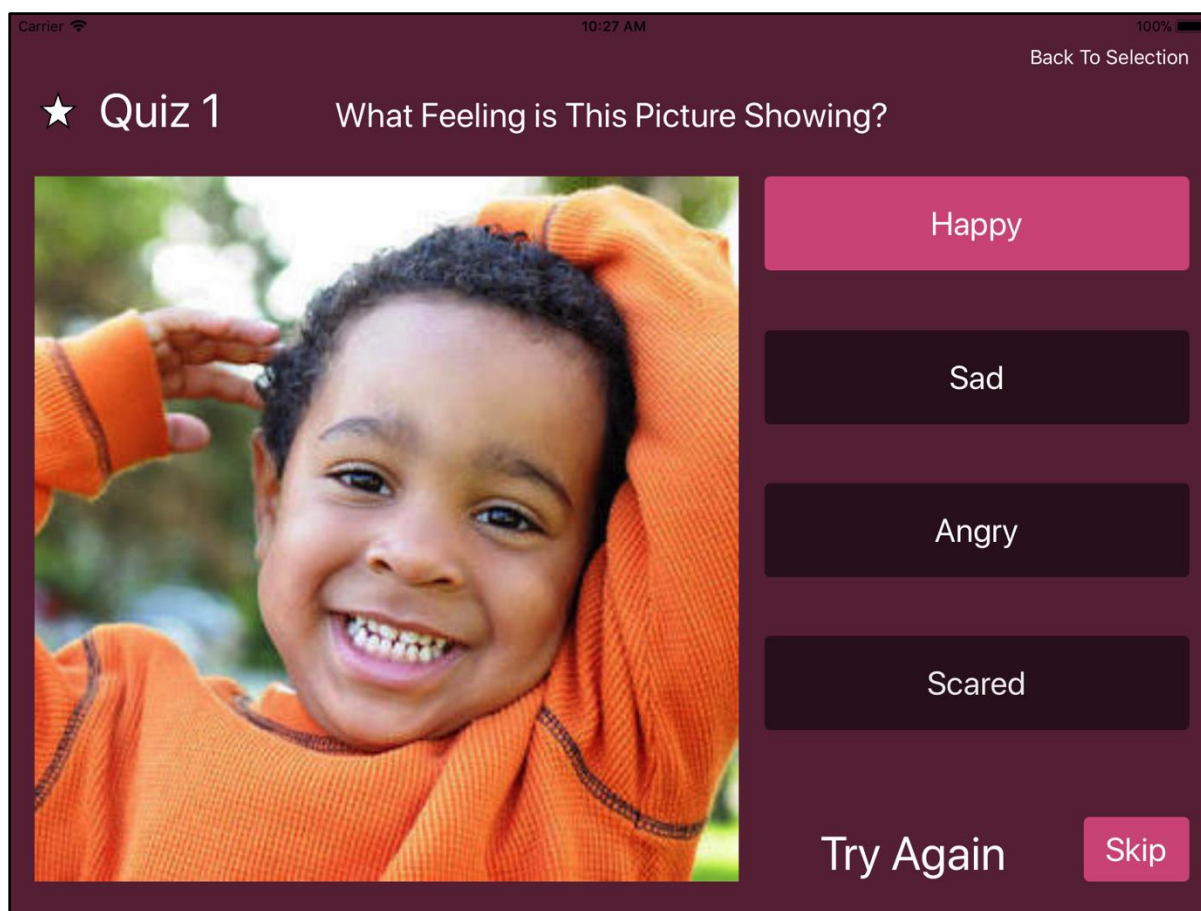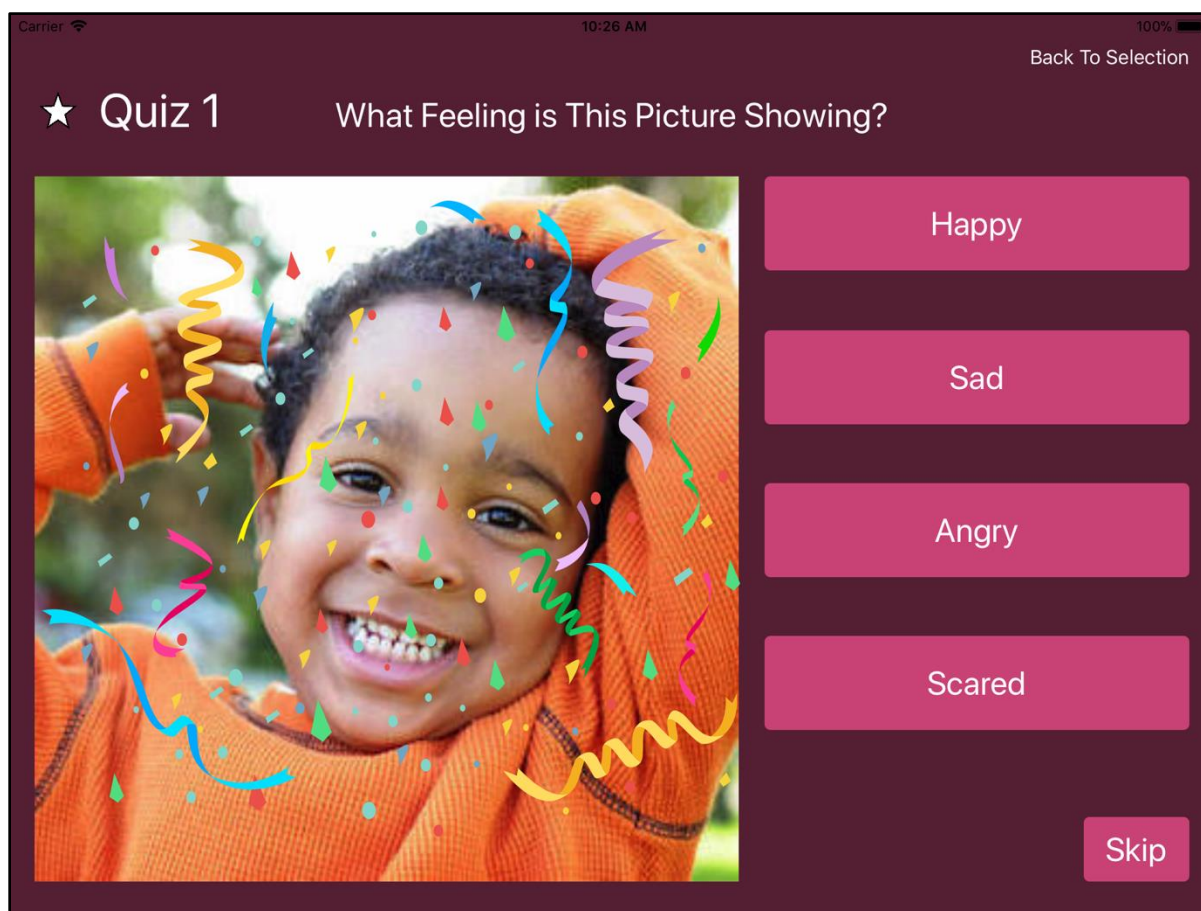| Description	If user selected "Play" from main menu they will be presented with the level selection page. The user can select the level that they would like to play. Each level has a set of questions with difficulty relevant to the level. Level 1 being the easiest and level 5 being the most difficult. Additionally, two buttons on the side are special levels design for the emotion API and the custom question maker feature. **Facial Fun Levels** are questions integrated with the emotion recognition API. The **Question Bank** are levels created by the user via Question Maker.
Action	User select button and redirect to selected screen.

5.4.1 Scenario 4a: Gameplay
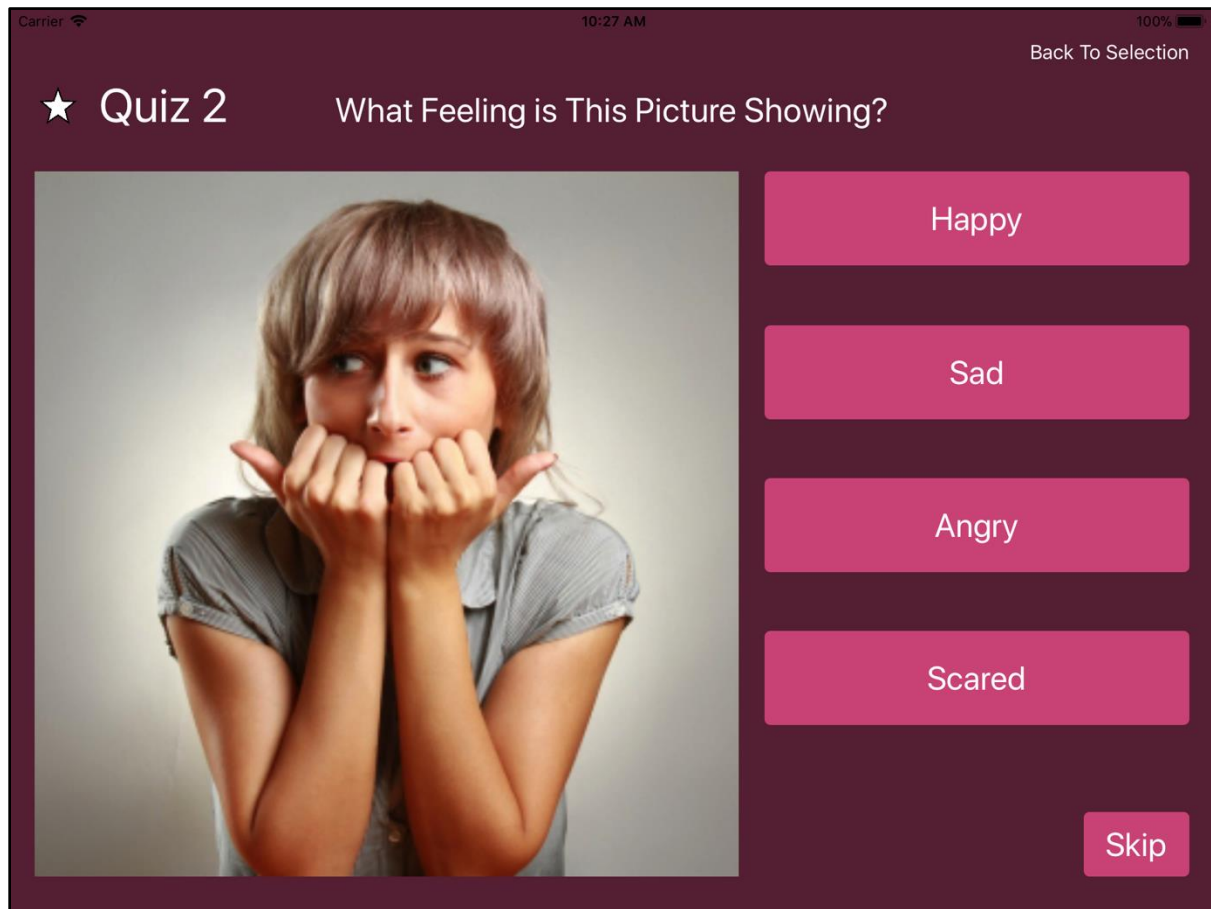

Figure 5 - *Initial Gameplay*

Description	In this particular scenario, the user has already made a selection (scenario 3b). The user is now engaged in a mini game, where the user answer the question "How does the Baby Feel?" by selecting a possible answer on the right-hand side of the screen. There will be only one correct answer. If the user selects the incorrect answer, the user will be presented with scenario 4b. If the user selects the correct answer, the user will be presented with scenario 4c. If the user decides to "skip", the user will be presented with scenario 4d. The three icons on the top right indicate from left to right, play voice over, show tip, and settings menu. These act as buttons that will redirect user to its respecting pages after pressing.
Action	User selects an option or skip question.

Scenario 4b: Gameplay - Incorrect Answer

Figure 6 - *Incorrect Answer*

Description	If user selects an incorrect answer, the buttons will be set to inactive and a sound and/or voice prompt that informs the user of an incorrect selection. The selected button will then be greyed out and cannot be selected again. If the user select the correct answer afterwards they will be presented with scenario 4c a response animation and sound prompt indicating user answered correctly. If all choices are picked expect for the correct one, the question will be skipped and shuffled back into the rotation. The user will encounter this question again if they had gone through all other questions.
Action	The user will select the remaining possible non greyed answers or the skip button.

Scenario 4c: Gameplay - Correct Answer

Figure 7 - *Correct Answer*

Description	If the user select the correct answer, an on-screen message/indication and sound and/or voice prompt will indicate the player that their answer was correct. Then the user will be presented with the next question (Scenario 4d). If all questions are answered within a given level the user will be redirected back to the level selection screen.
Action	No action required.

Scenario 4d: Gameplay - Next Question

Figure 8 - *Next Question*

Description	If user enters the correct answer or if user decided to skip a question, they will be presented with the next question. If all questions of a given level tier is answered correctly they will return to the level selection screen (Scenario 3b). Here the user can move onto the next level. If the user chose to return to main menu they can select main menu in the opinion menu which will return them to the home screen (Scenario 3a).
Action	User selects an answer or the skip option.

5.5 Scenario 5: Custom Question Maker

Figure 9 - *Question Maker Screen*

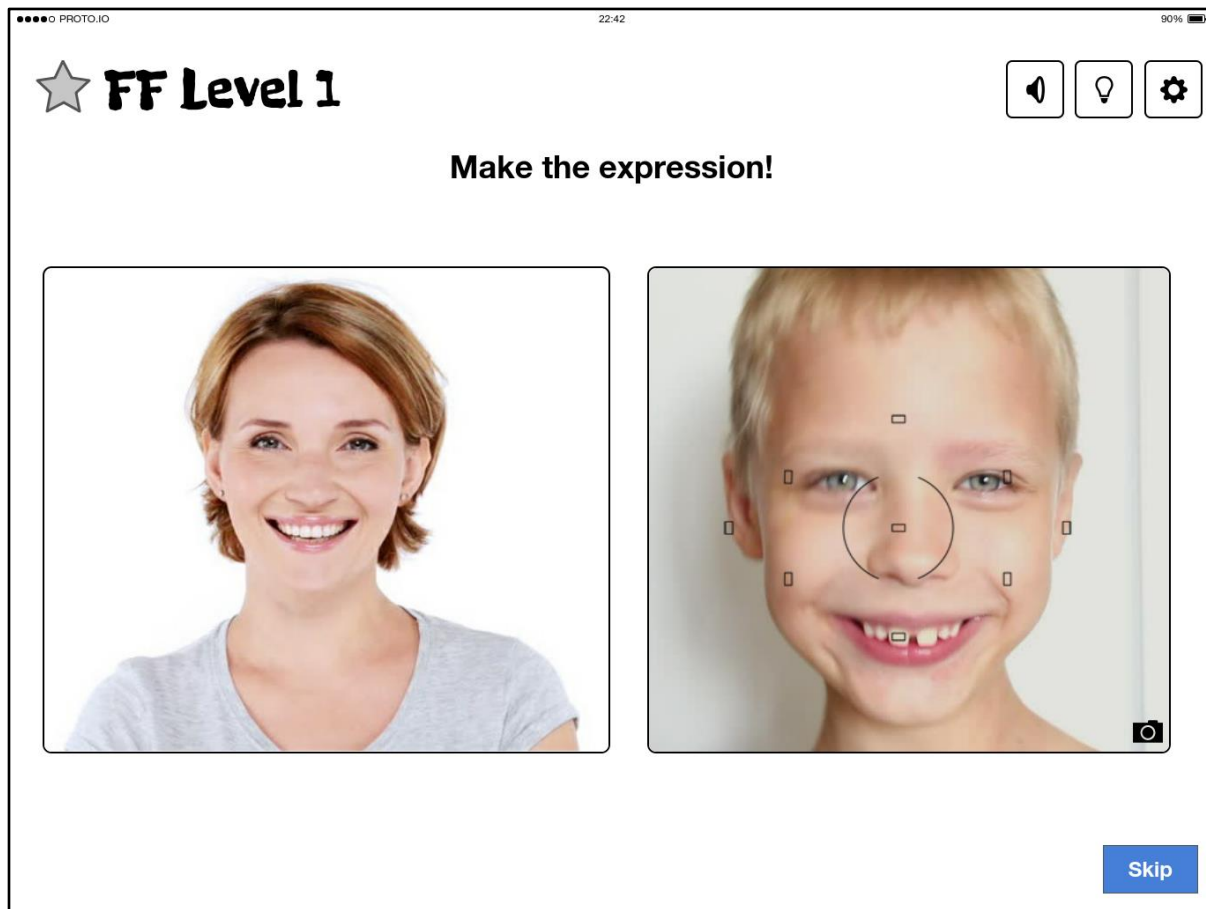| Description	This Question Maker scenario is where the user has the ability to create custom questions for the player. 1) The user will be required upload an image via mobile device 2) Enter a simple prompt for the image under "Question Prompt". 3) Select the appropriate emotion associated to the image under "Answer" If all is in order, the user can press "Create Question". If user decide to press "Main Menu" they will be returned to the main menu (Scenario 3).
Action	A) User selects the "Upload Image" box a) Image from photo gallery can be uploaded B) User select the empty text field under "Question Prompt" a) Touch screen keyboard will pop for input of text C) User will select an option under "Answer" a) Touch screen input to select the wanted answer D) User select button to "Create Question" or "Back" to return

5.6 Scenario 6: Facial Fun Level

Figure 10 - *Game play with Emotion Recognition API Integration*

Description	Emotion Recognition API (Affectiva) Gameplay will be a special level tier on its own. There levels are designed to ask the users to replicate facial expressions shown to them. It will ask user to allow access to the camera and ask the user to perform the emotion shown on the left of figure 10. The image taken on the right is then processed and a result will be output.
Action	A) User open camera, and perform the emotion displayed. B) Image capture will be processed into a Face Rectangle displaying only the core features of a face. C) Image is captured and processed buy the emotion API and a emotion high score is returned. D) The score will be matched the emotion threshold level. E) Result returns a correct or incorrect indication. F) User can try again if result is incorrect, or skip onto the next question G) If result is correct user will be presented with the next question.

6. Glossary

List all technical terms and their precise definitions here. These will be terms about your application, not about programming or software engineering. For example, in a grade-keeper application, terms like "course", "grade", "mark", and "GPA" all need precise definitions.

ASD: Autism Spectrum Disorder

API: Application Program Interface

GUI: Graphical User Interface

Primary Actors: The stakeholder that calls on the system to deliver one of its services.

Secondary Actors: Actors that system needs assistance from to achieve the primary actor's goal.

Preconditions: Condition that must be fulfilled before other things can happen or be done

Trigger: An event that cause another or situation to happen or exist.

Exceptions: Anomalous or exceptional conditions requiring special processing

User/Player: The intended audience, whoever is using the application.

Username: A string of any combination of 3 to 20 lowercase, uppercase, or numeric characters. Each username is unique and there can be no duplicates.

Password: A string of any combination of 6 to 20 lowercase, uppercase, or numeric characters.

Tier/Level: Identification of the degree of difficulty in the gameplay. Higher numbers results in more difficulty.

Emotion: A state of feeling that is distinguishable based on physical changes on an individual.

Game Server: This is the server database used for storage of information for the game. It handles user authentication, storing of user data and statistics uploaded from the app.

Feature Priority Definitions

P1 - Priority 1 (Highest: This is a required feature that can't be left out)
P2 - Priority 2 (Medium: The app can function without this feature)
P3 - Priority 3 (Low: Optional extra feature that can be added if there is time)

7. Reference

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