**Second Prototype Test Plan**

Speech Interactive Therapy App (SITA)



Team 13

Speech Therapy

Team Members

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**Required Materials:**

* Hardware:
  + An Android Phone (Testing touch features)
  + A Laptop with a Microphone (Used for console logs and main tests)
* Software:
  + Unity 3D Editor (on laptop)

**Measurable Criteria:**

* Voice Algorithm
  + Correct vocalizations should match the model word with accuracy > 30%
    - Note: A correct vocalization is not one where the same word is repeated, but rather a word that matches the RMS envelope of the model word. This emphasizes the child’s speech, not pronunciation.
  + Incorrect vocalizations should match the model word with accuracy < 15%
  + Constant vowel sounds should be classified as incorrect
  + Any vocalizations more than 0.7 seconds after the end of the model word should trigger an accuracy score
  + Rewards should be triggered by accuracy score within 3 seconds of detection
* Parent’s Corner
  + Keeps accurate track of the child’s progress by displaying the latest level the child has completed
* Rewards
  + Based on the calculated accuracy from the voice algorithm the correct reward scene has to be triggered.
  + All the particle effects along with the banners need to be triggered at the same time and keep emitting endlessly and switch to the next video after 10 seconds.
  + On touch screen enables devices the rewards scene should be interactive. That is when you touch anywhere on the screen golden particles should start shooting from the point of touch.
* Level Menu
  + Plays the correct video for every level

**Pre-Test Setup Procedure:**

1. Be sure to have a windows computer with Unity3D installed
2. Be sure to have apk file loaded onto android
3. App assumes background noise with minimal voice interference (one-on-one speech therapist setting). Ambient noise level less than 40 dB SPL (ideally less than 30 dB SPL).

**Testing Procedure:**

1. Run project on Unity (start at levels menu)
2. Run through model word tests
   1. False negative tests: Pass if correct vocalizations meet accuracy criteria (see Measurable Criteria)
   2. False positive tests: Pass if bogus vocalization input classifies as incorrect
3. Tampering test
   1. Saying “uuuuuuuuuuu” and clipping the mic as a vocalization does not score > 30%, ideally lower than 15%
      1. Note: The percent score is normalized to the absolute error of zero input. The score itself is not important, only the clear distinction between a correct and incorrect vocalization.
4. Check to make sure settings is updating current level properly
   1. Choose one level
   2. Choose level higher than it and check progress on settings
   3. Select a lower level and recheck progress to make sure it’s the higher level

**Voice Algorithm Score Sheet:**

|  |  |  |  |
| --- | --- | --- | --- |
| Model Word | Test Type | False Negative Test | False Positive Test |
| “Land” | Single word, single envelope peak (1 syllable) | 33% | 16% |
| “Letter” | Single word, two envelope peaks (2 syllables) | 29.0% | 15% |
| “Eleven” | Single word, complex envelope shape (3 syllables) | 40% | 24% |
| “Describe yourself” | Two Words | 30% | 23% |
| “How is your day” | Simple sentence | 34% | 18% |