Playing around Minimal Pairs to improve pronunciation training

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Computer Assisted Pronunciation Training (CAPT) apps are becoming widespread to aid learning new languages. However, they are still highly criticized for the lack of the unreplaceable need of direct feedback from a human expert. The combination of the right learning methodology with a gamification design strategy can, nevertheless, increase engagement and provide adequate feedback while keeping users active and comfortable.

In this paper, we introduce the second generation of a serious game[1] designed to aid pronunciation training for non-native students of English, Spanish or Chinese. The design of the new version of the game supports a learning methodology which is based in the combination of three different learning strategies: exposure, discriminations and pronunciation[2]. In exposure mode, players are helped to become familiar with the sounds of sequences of minimal pairs or trios, selected by a native linguist and presented at random. When in discrimination mode, users test their ability to discriminate between the phonetics of minimal pairs. They listen to the sound of one of the words in the pair and have to choose the right word on screen. In pronunciation mode, finally, subjects are asked to separately read aloud (and record) both words of each round of minimal pairs lists. Native pronunciation of a word can be played as many times as a user needs. When the test word is correctly uttered by the user, the corresponding icon changes its base colour to green, and gets disabled as a positive feedback message appears. Otherwise, a message with the recognized words appears on the graphical interface and a non-positive feedback message is presented. The word changes its base colour to red and gets disabled after five failures. Speech is recorded and played using commercial off-the-shelf ASR and TTS.

Our game adapts to the player as a function of right and wrong answers. Users collect points to reach a “phonetic level” and obtain different achievements, in order to encourage their engagement. There are different language dependent leaderboards based on points too, to increase the desire to play. Sharing results in social networks is another option that is under way.

From a pedagogical point of view, the use of Minimal Pairs[3] favours users awareness on the potential risks of producing wrong meanings when the correct phonemes are not properly realized. The discrimination of the words that make up a minimal pair is a challenging task for the ASR, since the phonetic distance between each couple of words can be really small, although clearly perceptible for a native speaker. To be efficient, minimal pairs lists are to be selected by expert linguists for each language.

Real use data acquisition and processing is still on-going, but preliminary results are promising and show that this learning and gaming strategy provides measurable improvement of learners’ pronunciation. The app offers an enjoying opportunity for anywhere anytime self-learning, and a tool for teachers to design challenging games.

References

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