

SUBTHEME: Interactivity, learner interaction, feedback

TITLE: English Pronunciation Learning System for Japanese Students Based on Diagnosis of Critical Pronunciation Errors

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We have developed an English pronunciation learning system which estimates the intelligibility of students' speech and ranks their errors from the viewpoint of improving their intelligibility. Error diagnosis is important for self-study since students tend to spend time on aspects of pronunciation that do not noticeably affect intelligibility.

As a preliminary experiment, seven Japanese students' speech was scored from 1 to 5 by linguistic experts. We also counted their error rates for each skill. We found that each intelligibility level is characterized by its distribution of error rates. Thus, we modeled each intelligibility level in accordance with its error rate. Error priority was calculated by comparing students' error rate distributions with that of the corresponding model.

As non-native speech is acoustically broader than the speech of native speakers, we developed the acoustic model to perform automatic error detection using speech data obtained from Japanese students. Moreover, we used Japanese phoneme models which bear no acoustical differences between English and Japanese, such as /b/ or /d/. As for supra-segmental error detection, we categorized errors frequently made by Japanese students and developed a separate acoustic model for that type of error detection.

Pronunciation learning involves two phases. First, students experience virtual conversation through movies and receive an error profile based on pronunciation errors detected during their conversation. Using the profile, students grasp characteristic tendencies in their pronunciation errors, which in effect lower their intelligibility. Students then practice correcting their individual errors with words or phrases. During this round, they receive the results of their error detection and instructions for correcting the error.

We have begun using this system in a CALL class at Kyoto University, and will be evaluating system performance through the use of questionnaires and speech data logged in the server. System performance will be presented in the final paper.