

A Prototype Reading Coach that Listens: Summary of Project LISTEN

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What: Project LISTEN is developing a novel weapon against illiteracy: an automated reading coach that displays a story on a computer screen, listens to a child read it aloud, and helps where needed. The coach provides a combination of reading and listening, in which the child reads wherever possible, and the coach helps wherever necessary. We demonstrated a prototype of this coach at the ARPA Workshop on Human Language Technology in March 1994. A short video shows the coach in action¹.

Who: The intended users of the coach include children in grades 1-3, where oral reading is emphasized. Its developers include experts on speech technology, reading, and human-computer interaction. Its testers include approximately 100 second graders in Pittsburgh public schools who have difficulty in reading.

Why: Illiteracy costs the United States over \$225 billion dollars annually in corporate retraining, lost competitiveness, and industrial accidents². Individuals with low reading proficiency are much likelier to be unemployed, poor, or incarcerated³. Automated literacy tutoring is an important, real, and challenging task requiring multimodal interaction and real-time response.

How: Project LISTEN is made possible by years of government-funded research that produced CMU's Sphinx-II speech recognizer⁴, which we adapted to detect errors in oral reading of known text^{5,6,7}. We modelled the coach after expert reading teachers and refined it based on experimental use⁸.

Evaluation: Pilot experiments reported in⁷ tested both the coach's accuracy in detecting reading errors, and its potential effectiveness in helping children read.

Future work: Our primary goal is to extend and deploy the coach in order to help children read better over time. Possible spinoff applications include adult literacy, English as a second language, foreign language learning, interactive entertainment, and computer-assisted writing. We envision a new generation of intelligent tutoring systems that listen to their students, providing individualized attention that conventional classrooms cannot.

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