

DARPA Tactical Language Training Project

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The Problem

Military and civilian personnel are frequently assigned missions that require them to communicate effectively with speakers of other languages. It is costly and often impractical to rely on interpreters for this purpose, and cultural differences can lead to misunderstandings even when interpreters are present. It would be far better to help personnel to quickly gain a rudimentary understanding of language and culture themselves, so that they can accomplish their missions without extensive support from language experts.

Unfortunately, adult learners often find it difficult to acquire even a rudimentary working knowledge of a foreign language. An element of the problem is outdated language learning curricula, which are often boring and do not focus on what people need to carry out their work activities. But part of the problem is fundamental to the nature of adult language learning itself. Effective face-to-face communication requires linguistic skills and adequate knowledge of the language and culture. The ability of a learner to master these skills depends upon their individual background, aptitude, and motivation. An effective computer-aided language learning system needs to take these factors into account and adapt instruction to enable each learner to overcome their individual barriers to learning and meet their individual learning goals.

Technical Objectives

The objective of this project is to develop tools to support individualized language learning, and apply them to the acquisition of *tactical languages*: subsets of linguistic, gestural, and cultural knowledge and skills necessary to accomplish specific missions. In order to maximize learner motivation and give learners effective practice opportunities, learners will practice on acquiring vocabulary items and recognizing gestures and then apply them in simulated missions where they interact with avatars and virtual characters. The training system enables learners to communicate directly with on-screen characters using a speech input interface. Our objective is to make the toolset easily applied to new tactical languages, missions, and training contexts.

Solution

The technical solution includes the following components:

- A computer-based language training system for multiple Middle Eastern languages.
- An authoring tool that facilitates the creation of specialized language exercises and curricula, sequenced automatically based on learner performance.
- Techniques for immediate detection of speaker dysfluencies and other problems requiring feedback and remediation.
- Tools for tracking learner focus of attention, fatigue, and effort, employing vision techniques, and for inferring learner motivation.
- Software for managing interactive mission scenarios, and for controlling the behavior of animated characters within those scenarios, in order to promote learning goals
- Tools for training natural language processing tools rapidly on new tactical languages, from example scenarios.