Chapter 7

Designing for Speaker Authentication

Judith A. Markowitz
J. Markowitz, Consultants

Key words: speaker authentication, speaker verification, speaker recognition, biometrics, voice-based biometrics

Abstract: Since September 11, 2001 there has been a sharp increase in the use of biometric-based security, including speaker authentication. Some of the guidelines for developing usable speaker authentication dialogs correspond to basic principles that apply to the design of good speech recognition interactions. Developing effective speaker authentication dialogs for security also demands attention to considerations that are distinct from – and sometimes contrary to – those used for speech recognition.

1. INTRODUCTION

The terrorist attacks perpetrated against the United States on September 11, 2001 spawned a sharp increase in interest in and use of biometric-based security. Among the technologies of special interest to government and private industry is speaker authentication: technology that uses features of a person’s voice to verify that that person is, indeed, who she or he claims to be.

The aim of this paper is to provide a solid foundation for building effective speaker authentication dialogs. Guidelines for constructing usable speaker authentication dialogs include many of the basic principles that govern creation of good speech recognition interactions, but the two are not identical. Speaker authentication dialogs that provide effective security
demand attention to considerations that are distinct from – and sometimes contrary to – those used for speech recognition.

1.1 The Speaker Authentication Family

Speaker authentication is a biometric-based security process. It belongs in a category called *speaker recognition* or *voice-based biometrics*. Voice-based biometrics are the most diversified and complex of biometrics. As *Figure 1* indicates, one reason for this is that speaker recognition is part of two larger families: speech processing and biometrics.

![Figure 1. Speaker Recognition Family Tree](image1)

A closer look at the speaker-recognition category (*Figure 2*) reveals that it includes a large number of technologies.

![Figure 2. Speaker Recognition Techniques](image2)