# Abstract

This thesis consist of two parts. In the first part we study a large database containing more than 100.000 audiograms, the hearing loss as a function of frequency. We fit a quadratic curve to each of the audiograms and study the distribution of regression coefficients. We conclude that there is no evidence for different categories of audiograms as other authors have claimed. Rather, the distribution of regression coefficients follows a multivariate normal distribution. To test the quality of the quadratic model, we used leave-one-out cross validation and show that the quadratic model does reasonably well, but that the cross-validation error is about 3 times as large as the test-retest variability. The ultimate goal of the analysis is an automated procedure for measuring an audiogram.

The second part consists of the problem of adoption of the new measuring technology by audiologists. Qualitative market research among five audiologists/hearing aid specialists has given us insight in factors which influence the adoption rate of the new measuring technique. We conclude that most audiologists are satisfied with the current staircase technique, do not think the procedure can be performed much faster and perceive audiometric equipment as expensive. The performance risk is the dominant factor in the decision process, while the financial risk is perceived differently by independent and chain store audiologists. To lower the switching costs, the new technology should be designed towards currently available software, for example a plugin. We also conclude that the biggest improvements can be achieved with young children or people with a mental handicap. This is a suitable target market for the new technology.