

Study Of Effect Of Speaker Variability And Driving Conditions On the Performance of an ASR Engine Inside a Vehicle

Shubha Kadambe

Abstract

Spoken dialogue based information retrieval systems are being used inside vehicles. The user satisfaction of using such a system depends on how an ASR engine performs. However, the performance of an ASR is affected by speaker variability, driving conditions, etc.. Here, we report the study that we performed to analyze these effects of speaker variability, different driving conditions and the effect of driving task on the ASR performance. This study consists of experimental design, data collection and systematically testing an ASR engine using this data. From the obtained results, it can be observed that (I) the ASR performance exhibits (a) significant speaker variability since the stress of driving task varies from speaker to speaker, (b) significant performance degradation across driving conditions since the noise type and level varies and (c) significant effect of driving task on recognition performance, and (II) the effect of live noise on recognition performance is not same as adding car noise to the pre-recorded speech data. The former observations are important since by just training an ASR engine on lots of speech data will not help and it is essential to include stress factors and cognition load in ASR engines to improve its performance.