

Title: Packet Loss Concealment Estimating Residual Errors of Forward-Backward Linear Prediction for Bone-Conducted Speech

Author: Ohidujjaman, Nozomiko Yasui, Yosuke Sugiura, Tetsuya Shimamura, Hisanori Makinae

Abstract: This study proposes a suitable model for packet loss concealment (PLC) by estimating the residual error of the linear prediction (LP) method for bone-conducted (BC) speech. Instead of conventional LP-based PLC techniques where the residual error is ignored, we employ forward-backward linear prediction (FBLP), known as the modified covariance (MC) method, by incorporating the residual error estimates. The MC method provides precise LP estimation for a short data length, reduces the numerical difficulties, and produces a stable model, whereas the conventional autocorrelation (ACR) method of LP suffers from numerical problems. The MC method has the effect of compressing the spectral dynamic range of the BC speech, which improves the numerical difficulties. Simulation results reveal that the proposed method provides excellent outcomes from some objective evaluation scores in contrast to conventional PLC techniques.

Keywords: Autocorrelation method; Bone-conducted speech; Modified covariance method; Packet loss concealment; Residual error

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