

SOME MATHEMATICALLY-ORIENTED METHODS RELATED TO LP (LINEAR PREDICTIVE SPECTRAL MODELLING OF SPEECH)

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Abstract

This work presents three perspectives into linear predictive spectral modelling of speech. First, a well-known means to represent linear predictive information based on the line spectrum pair (LSP) polynomials is studied. In difference to its most widely used application as a method to quantise linear predictive spectral models, the LSP decomposition is employed in the present work as a general spectral modelling method. Certain new properties concerning the root locations of the LSP polynomials are described. Second, the thesis addresses weighted linear predictive models. These are AR models that are defined by utilising temporal weighting to the square of the prediction error, or residual, in computing the optimal filter coefficients. Third, the study proposes variants to the conventional LP by imposing constraints in the formulation of linear predictive computation to obtain vocal tract models for glottal inverse filtering.

Keywords : LP, LPS, weighted linear predictive models, the vocal tract transfer function, inverse filtering.