Extrapolation of Wideband Speech From the Telephone Band

by

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A thesis submitted in conformity with the requirements
for the degree of Master of Applied Science
Graduate department of Electrical and Computer Engineering
The University of Toronto

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Telephone speech is bandlimited to the frequency range between 300 and 3300 Hz, which compromises its quality. Wideband speech, accommodating frequencies up to 7000 Hz, provides higher quality but at a cost of increased transmission bandwidth. The proposed pseudo-wideband (PWB) speech algorithm regenerates approximations of the bands missing from telephone speech. This is possible because of the strong inter-band correlations which stem from the acoustics of the production apparatus.

For this receiver-based algorithm, the improvement in effective bandwidth requires no extra transmission bandwidth, and involves no codec standardization issues. The spectral envelope and spectral detail are deconvolved via linear predictive analysis, and each is mapped independently to its PWB counterpart. The algorithm is based on parametric analysis using a uniform tube tract model, and has good potential for speaker independence. Performance was encouraging for a preliminary investigation, but a more sophisticated acoustic model is desirable for additional quality improvement.

Acknowledgments

I would like to thank my supervisor, Professor Frank Kschischang, for his invaluable advice and encouragement throughout the research and preparation of this thesis. I would also like to acknowledge my family for their unerring support. Finally, I would like to thank my friends, especially Joel Alo and Lucy Pegoraro, for their continual support and tolerance.

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