

音声情報処理とその福祉・医療・リハビリ分野への工学的応用

Speech Information Processing and Its Applications to Welfare, Biomedical and Rehabilitation Field

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上田 裕市 教授 工学博士 / **Yuichi UEDA** Prof., Dr. Eng.
 環境科学部門 医用福祉工学分野 / Research Field of Biomedical and Welfare Engineering
 E-mail : ueda@cs.※ Tel : 096-342-3847 URL : http://www.voice.cs.kumamoto-u.ac.jp/

●リアルタイム音声分析方式の提案と応用

音声の知覚や音声認識・合成などの応用分野において重要な音声特徴量であるホルマント周波数や基本周波数を高精度で抽出可能な実時間処理システム (Figure. 1) をベースにして構築した音声特徴推定エンジン (Figure 2) を用いて、様々な音声応用分野への展開を行っている。

●発声訓練や診断補助のための音声可視化システムの開発

音声特徴推定エンジンを用いた音声解析技術と様々な音声可視化手法をベースとして、聴覚障害者や聾者の発声発話訓練ツール、構音障害の診断補助システム、劣化音声の健全化処理による音声復元システムなど、福祉・医療分野における音声言語インタフェース技術の開発を行っている。

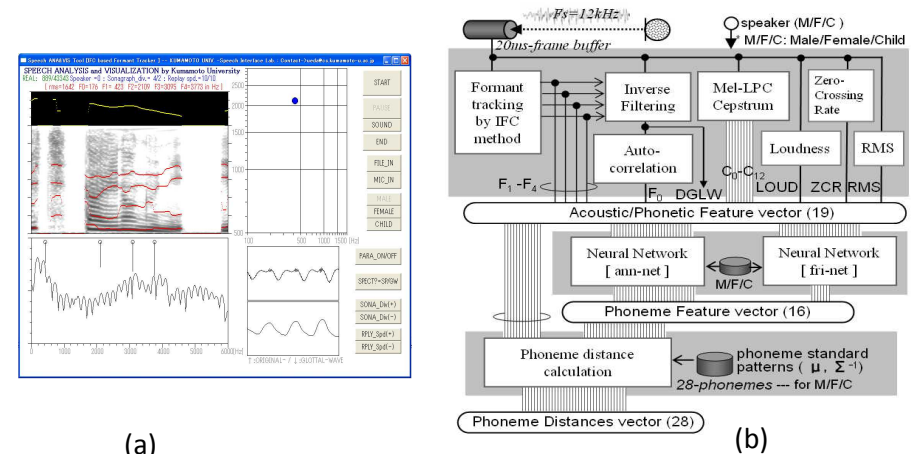


Figure 1 Speech Real-time Speech Analysis Tool (a) and Speech Feature Estimation Engine (b)

Proposal of real-time speech analysis based on IFC-based formant estimation: Speech formant and pitch frequencies play a significant role in areas of speech perception, recognition and synthesis. We have proposed a new technique called IFC method (Figure 1(a)), where speech features of formant and pitch are precisely estimated, and developed a real-time system (Figure 1(b)) for the purpose of applications to such as a speech visualization system (Figure 2).

Development of speech visualization systems for speech training and dysarthric diagnosis: We have developed various type of speech visualization tools based on the real-time speech feature estimation engine (Figure 1(b)). Those are speech training tools for the hearing impaired and deaf children, pitch control tools in singing, diagnosis assisting system for dysarthria and so on. Figure 2 shows those windows-based applications.

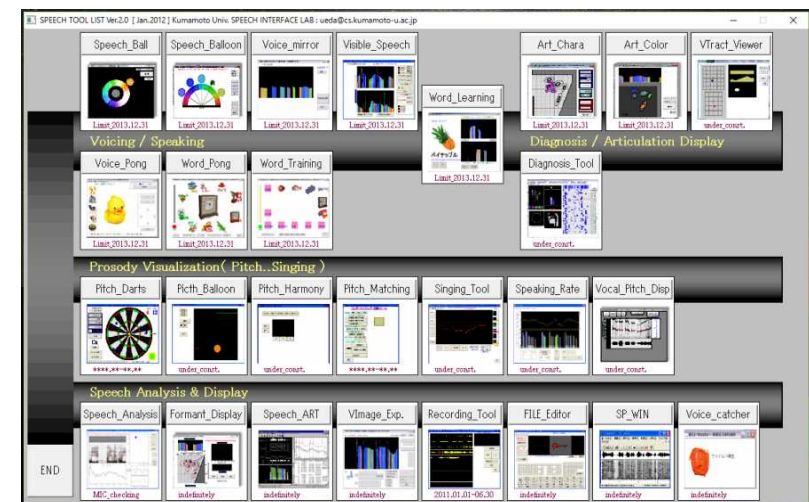


Figure 2 Speech Visualization Tools for Speech Training, Pitch Training and Diagnosis based on the Real-time Speech Processing Technique.