Темпоральные характеристики

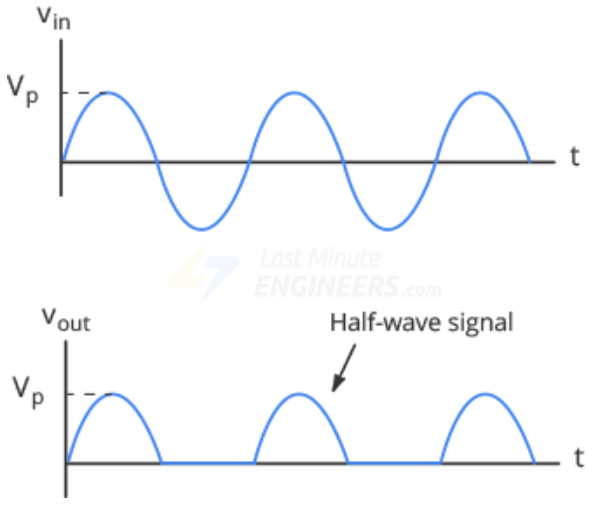
П. А. Холявин

p.kholyavin@spbu.ru

07.11.2024

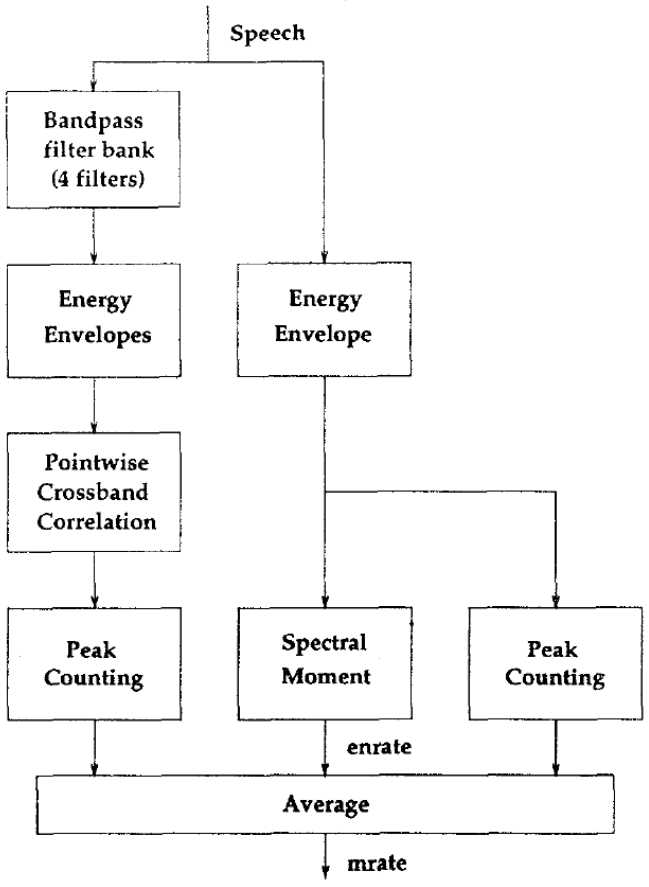
Оценка темпа: enrate

1. Полуволновое выпрямление сигнала
2. Фильтр низких частот (до 16 Гц)
3. Снижение ЧД до 100 Гц
4. Окно Хэмминга (1-2 с, перекрытие >= 75 %)
5. Преобразование Фурье
6. Спектральный момент



$$enrate = \frac{\sum_{k=s}^{K} k\,|Y(k)|^2}{\sum_{k=s}^{K} |Y(k)|^2}$$

Оценка темпа: mrate



That is, if $x_i(n)$ is the compressed energy envelope of the i^{th} spectral band, we define a new trajectory $y(n)$ as

$$y(n) = \frac{1}{M} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} x_i(n) x_j(n) \qquad (2)$$

where N is the number of bands and $M = \frac{(N)(N-1)}{2}$ is the number of unique pairs.

Figure 1: Major steps in the calculation of *mrate*. The bandpass processing currently uses steep FIR filters with band edges of (300,800), (800,1500), (1500,2500), and (2500,4000). Estimation is typically done over 1-2 seconds; for the experiments reported here, we used between-pause intervals, which varied from .25 to 6 seconds, but which were most typically between .5 and 2 seconds.

Оценка темпа: TCSSBC

Temporal correlation and selected sub-band correlation

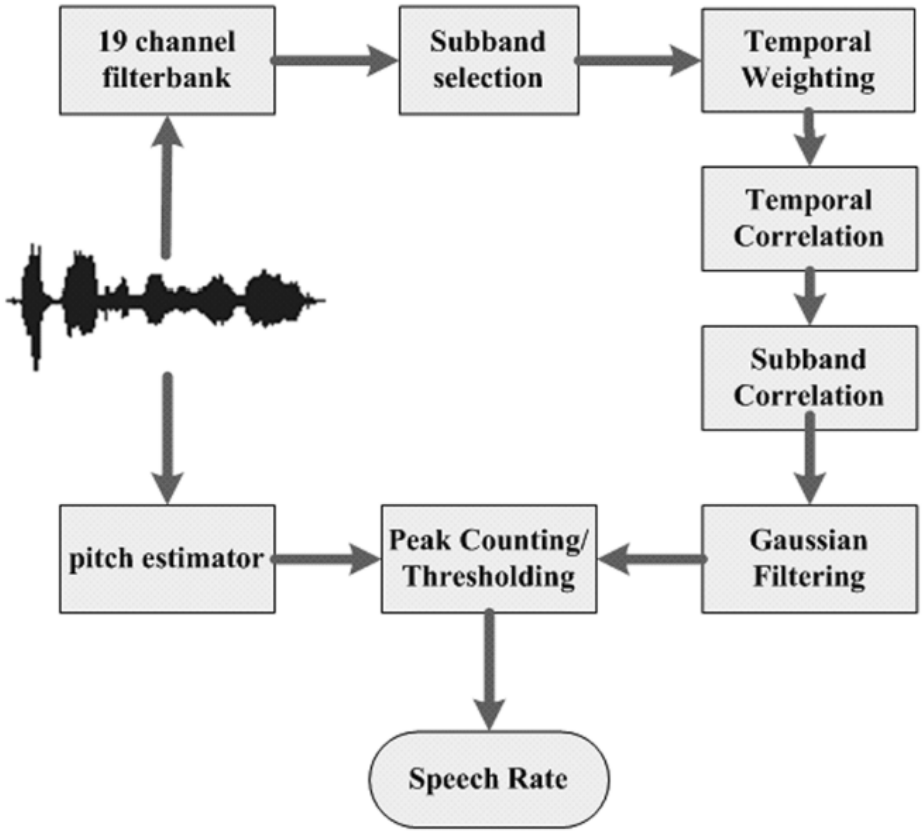
1. Спектральный анализ: 19 полос, выбираем M с наибольшей энергией

2. Темпоральный анализ: кросс-корреляция

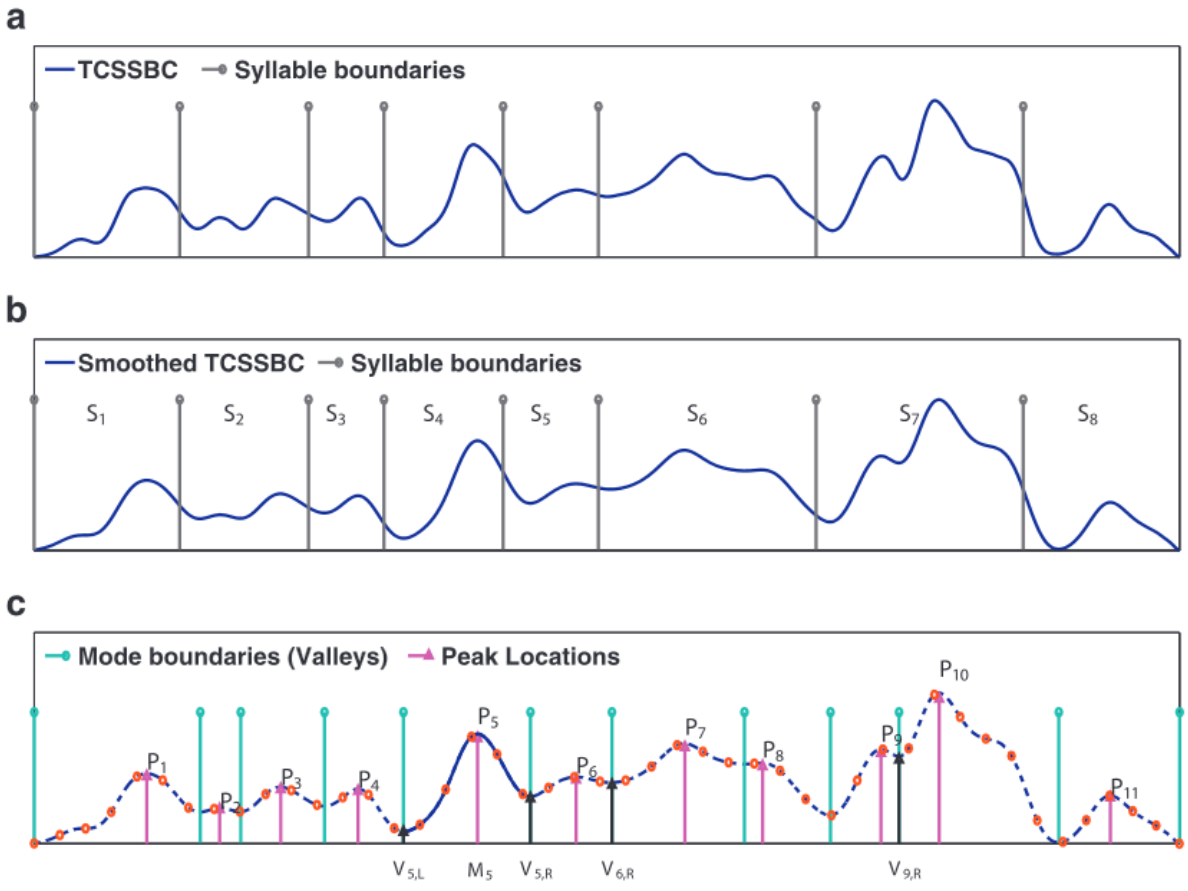
Let $x_t, x_{t+1}, \ldots, x_{t+K-1}$ represent an increasing time order of subband energy vectors with length K. We then compute correlation y_t as

$$y_t = \sqrt{\frac{1}{2K(K-1)} \sum_{j=0}^{K-2} \sum_{p=j+1}^{K-1} x_{t+j} \bullet x_{t+p}}. \qquad (2)$$

Оценка темпа: TCSSBC



Оценка темпа: TCSSBC+



Спасибо за внимание!