WHAT IS CLAIMED IS:

1. A method for speech processing, the method comprising:

determining an unvoicing/voicing parameter reflecting a characteristic of unvoiced/voiced speech in a current frame of a speech signal comprising a plurality of frames, wherein the unvoicing/voicing parameter is a combined parameter reflecting at least two characteristics of unvoiced/voiced speech;

determining a smoothed unvoicing/voicing parameter to include information of the unvoicing/voicing parameter in a frame prior to the current frame of the speech signal;

computing a difference between the unvoicing/voicing parameter and the smoothed unvoicing/voicing parameter; and

determining whether the current frame comprises unvoiced speech or voiced speech using the computed difference as a decision parameter.

~~2. The method of claim 1, wherein the unvoicing/voicing parameter is a combined parameter reflecting at least two characteristics of unvoiced/voiced speech.~~

~~3~~2. The method of claim ~~2~~1, wherein the combined parameter is a product of a periodicity parameter and a spectral tilt parameter.

~~4~~3. The method of any of claims 1 to 3, wherein the unvoicing/voicing parameter is an unvoicing parameter ($P_{unvoicing}$) reflecting a characteristic of unvoiced speech, wherein the smoothed unvoicing/voicing parameter is a smoothed unvoicing parameter ($P_{unvoicing_sm}$).

~~5~~4. The method of claim ~~4~~3, wherein when the difference between the unvoicing parameter and the smoothed unvoicing parameter is greater than 0.1, determining the current frame of the

speech signal to be an unvoiced signal, wherein when the difference between the unvoicing parameter and the smoothed unvoicing parameter is less than 0.05, determining the current frame of the speech signal to be not an unvoiced speech

~~6~~5. The method of claim ~~5~~4, wherein when the difference between the unvoicing parameter and the smoothed unvoicing parameter is between 0.05 to 0.1, determining the current frame of the speech signal to have the same speech type as the prior frame.

~~7~~6. The method of any of claims ~~4~~3 to ~~6~~5, wherein the smoothed unvoicing parameter is computed from the unvoicing parameter as follows.

$$
\begin{aligned}
&\textit{if} \quad (P_{unvoicing_sm} > P_{unvoicing}) \quad \{ \\
&\qquad P_{unvoicing_sm} \Leftarrow 0.9\,P_{unvoicing_sm} + 0.1\,P_{unvoicing} \\
&\} \\
&\textit{else} \quad \{ \\
&\qquad P_{unvoicing_sm} \Leftarrow 0.99\,P_{unvoicing_sm} + 0.01\,P_{unvoicing} \\
&\}.
\end{aligned}
$$

~~8~~7. The method of ~~any of claims 1 to 3~~claim 1 or 2, wherein the unvoicing/voicing parameter is a voicing parameter ($P_{voicing}$) reflecting a characteristic of voiced speech, and wherein the smoothed unvoicing/voicing parameter is a smoothed voicing parameter ($P_{voicing_sm}$).

~~9~~8. The method of claim ~~8~~7, wherein when the difference between the voicing parameter and the smoothed voicing parameter is greater than 0.1, determining the current frame of the speech signal to be an voiced signal, and wherein when the difference between the voicing parameter

and the smoothed voicing parameter is less than 0.05, determining the current frame of the speech signal to be not an voiced speech.

~~10~~9. The method of claims ~~8~~ 7 or ~~9~~8, wherein the smoothed voicing parameter is computed from the voicing parameter as follows.

$$
\begin{aligned}
&\textit{if} \quad (P_{voicing_sm} > P_{voicing} \quad) \quad \{ \\
&\qquad P_{voicing_sm} \quad \Leftarrow \quad (7/8)\, P_{voicing_sm} \quad + \quad (1/8)\, P_{voicing} \\
&\} \\
&\textit{else} \quad \{ \\
&\qquad P_{voicing_sm} \quad \Leftarrow \quad (255/256)\, P_{voicing_sm} \quad + \quad (1/256)\, P_{voicing} \\
&\}.
\end{aligned}
$$

~~11~~10. The method of any of claims 1 to ~~10~~9, wherein the frame comprises a subframe.

~~12~~11. A speech processing apparatus comprising:

a processor; and

a computer readable storage medium storing programming for execution by the processor, the programming including instructions to:

determine an unvoicing/voicing parameter reflecting a characteristic of unvoiced/voiced speech in a current frame of a speech signal comprising a plurality of frames, wherein the unvoicing/voicing parameter is a combined parameter reflecting at least two characteristics of unvoiced/voiced speech,

determine a smoothed unvoicing/voicing parameter to include information of the unvoicing/voicing parameter in a frame prior to the current frame of the speech signal,

compute a difference between the unvoicing/voicing parameter and the smoothed

unvoicing/voicing parameter, and

determine whether the current frame comprises unvoiced speech or voiced speech using the computed difference as a decision parameter.

~~13~~12. The apparatus of claim ~~12~~11, wherein the unvoicing/voicing parameter is a combined parameter reflecting a product of a periodicity parameter and a spectral tilt parameter.

~~14~~13. The apparatus of claims ~~12~~ 11 or ~~13~~12, wherein when the difference between the unvoicing/voicing parameter and the smoothed unvoicing/voicing parameter is greater than 0.1, determining the current frame of the speech signal to be an unvoiced/voiced signal, wherein when the difference between the unvoicing/voicing parameter and the smoothed unvoicing/voicing parameter is less than 0.05, determining the current frame of the speech signal to be not an unvoiced/voiced speech.

~~15~~14. The apparatus of any of claims ~~12~~ 11 to ~~14~~13, wherein the unvoicing/voicing parameter is an unvoicing parameter reflecting a characteristic of unvoiced speech, and wherein the smoothed unvoicing/voicing parameter is a smoothed unvoicing parameter.

~~16~~15. The apparatus of any of claims ~~12~~ 11 to ~~14~~13, wherein the unvoicing/voicing parameter is a voicing parameter reflecting a characteristic of voiced speech, and wherein the smoothed unvoicing/voicing parameter is a smoothed voicing parameter.

~~17~~16. The apparatus of any one of claims ~~13~~ 11 to ~~16~~15, wherein the frame comprises a subframe.