

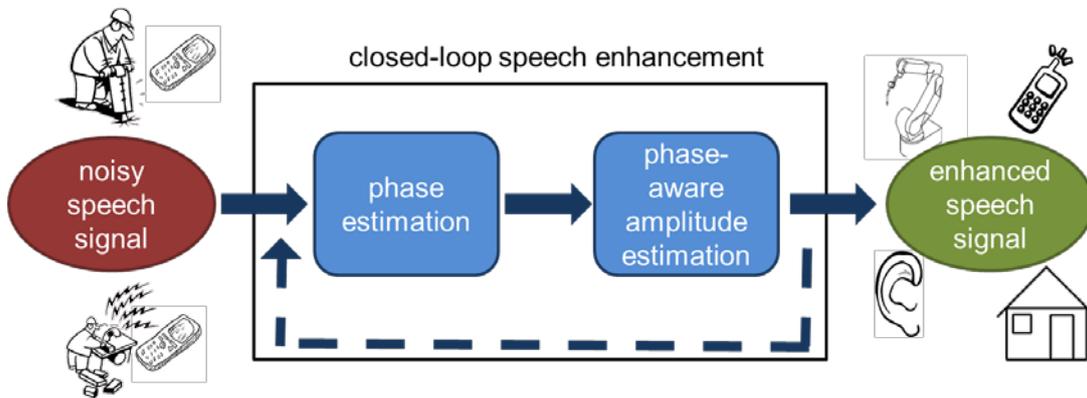
TECHNOLOGY OFFER

Phase-aware and Iterative Closed-loop Speech Enhancement System

To push the limits of the state of the art the speech enhancement stage has been redesigned in an iterative closed-loop configuration composed of speech phase estimation and phase-aware amplitude estimation. A strong improvement of the complex speech signal spectrum has been reached.

BACKGROUND

In many speech signal applications (e.g. automatic speech recognition, mobile telecommunication) noisy signals are pre-processed to provide enhanced speech signals (as close as possible to the clean but unavailable speech). This is mostly done by using a background noise estimator in combination with a frequency-dependent gain function. These methods mostly filter the noisy signal in the spectral amplitude domain only and copy the noisy phase spectrum for signal reconstruction. Therefore, the improvement achieved by state-of-the-art speech enhancement technology is limited.



ADVANTAGES

The redesigned speech enhancement system provides improved obtained speech quality compared to state-of-the-art solutions, including

- Reduced musical noise
- Higher noise reduction
- Significant improvement of speech enhancement at low-signal-to-noise ratios and different noise scenarios
- Real-time capable processing with a low real time factor

Potential Fields of Application

The proposed technology can be used in various industrial applications like

- Automatic Speech Recognition (ASR); e.g. home automation (smart home), voice control for cars, mobile devices or industry robots
- Dictation Systems
- Speaker Verification/Identification
- Hearing Aids; e.g. reduced speech distortion (musical noise), improved obtained speech quality.
- Speech Transmission; e.g. mobile telecommunication, VoIP

A demo showing the benefits at different noise conditions can be found under

<http://www.spssc.tugraz.at/SPL2013phase>

Ref.no.: E_516

KEYWORDS:

Speech enhancement
Phase-aware
Iterative closed loop

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COOPERATION OPTIONS:

- Licensing
- Technical co-operation

DEVELOPMENT STATUS:

- Proof of concept
- Live demo

STATUS OF PATENTS:

European patent
application filed

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