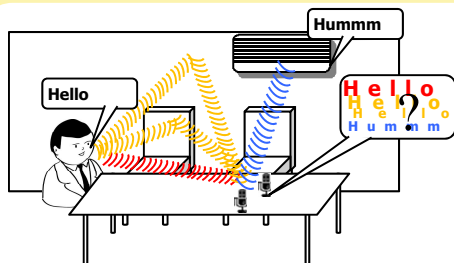


## Abstract

Speech recorded in a room with distant microphones is usually distorted due to reverberation caused by the reflection of the sound on the walls. In addition, noise also affects the quality of recorded speech. It is difficult for people and machines to understand such noisy and reverberant speech clearly. To tackle this problem, we have developed a recognition system that **combines advanced speech dereverberation, noise reduction and deep learning-based automatic speech recognition**. Our proposed system greatly improves automatic speech recognition performance and **achieved top score** in an international reverberant speech recognition competition. This achievement opens the way for more natural interaction with computers or robots.

## Problem

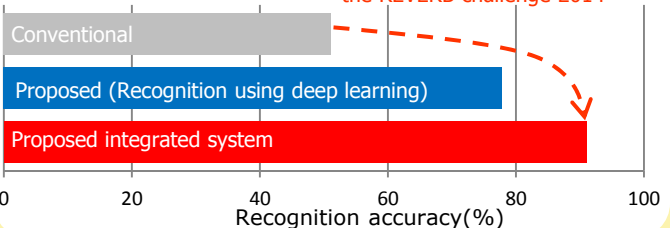
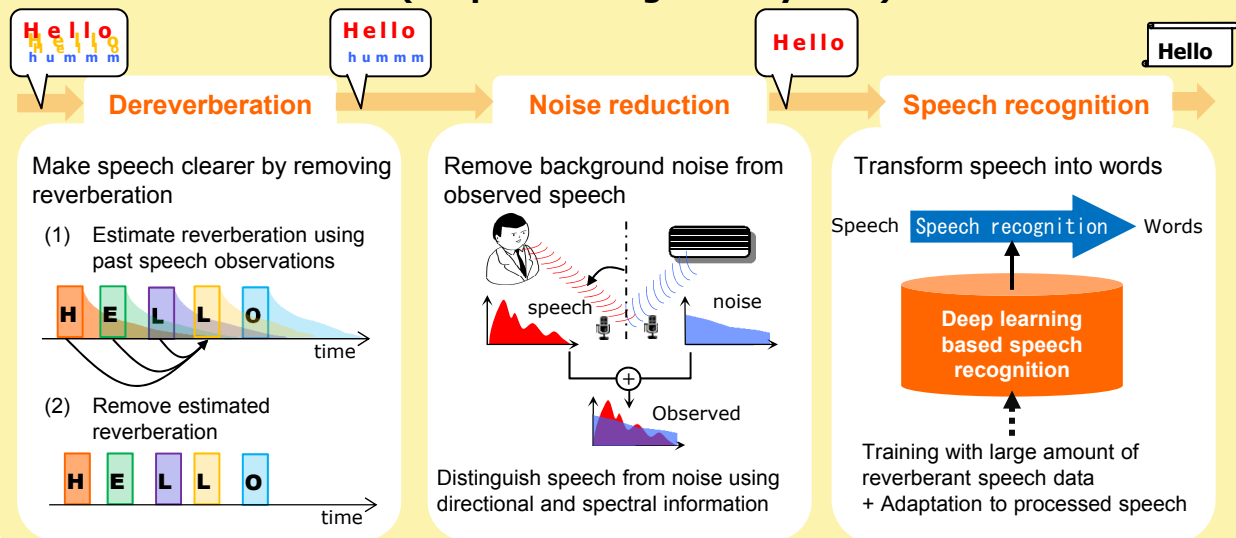


Difficult for people and machines to understand noisy and reverberant speech

## Result

High recognition performance for speech recorded in reverberant living rooms

Top score among 19 teams for the REVERB challenge 2014

Technology for reverberant speech recognition  
(Proposed integrated system)

## Related work

[1] M. Delcroix, T. Yoshioka, A. Ogawa, Y. Kubo, M. Fujimoto, N. Ito, K. Kinoshita, M. Espi, T. Hori, T. Nakatani, A. Nakamura, "Linear prediction-based dereverberation with advanced speech enhancement and recognition technologies for the REVERB challenge," in *Proc. REVERB workshop*, 2014..

## Contact

**Marc Delcroix** Signal Processing Research Group, Media Information Laboratory  
E-mail : marc.delcroix{at}lab.ntt.co.jp (Please replace {at} with @)