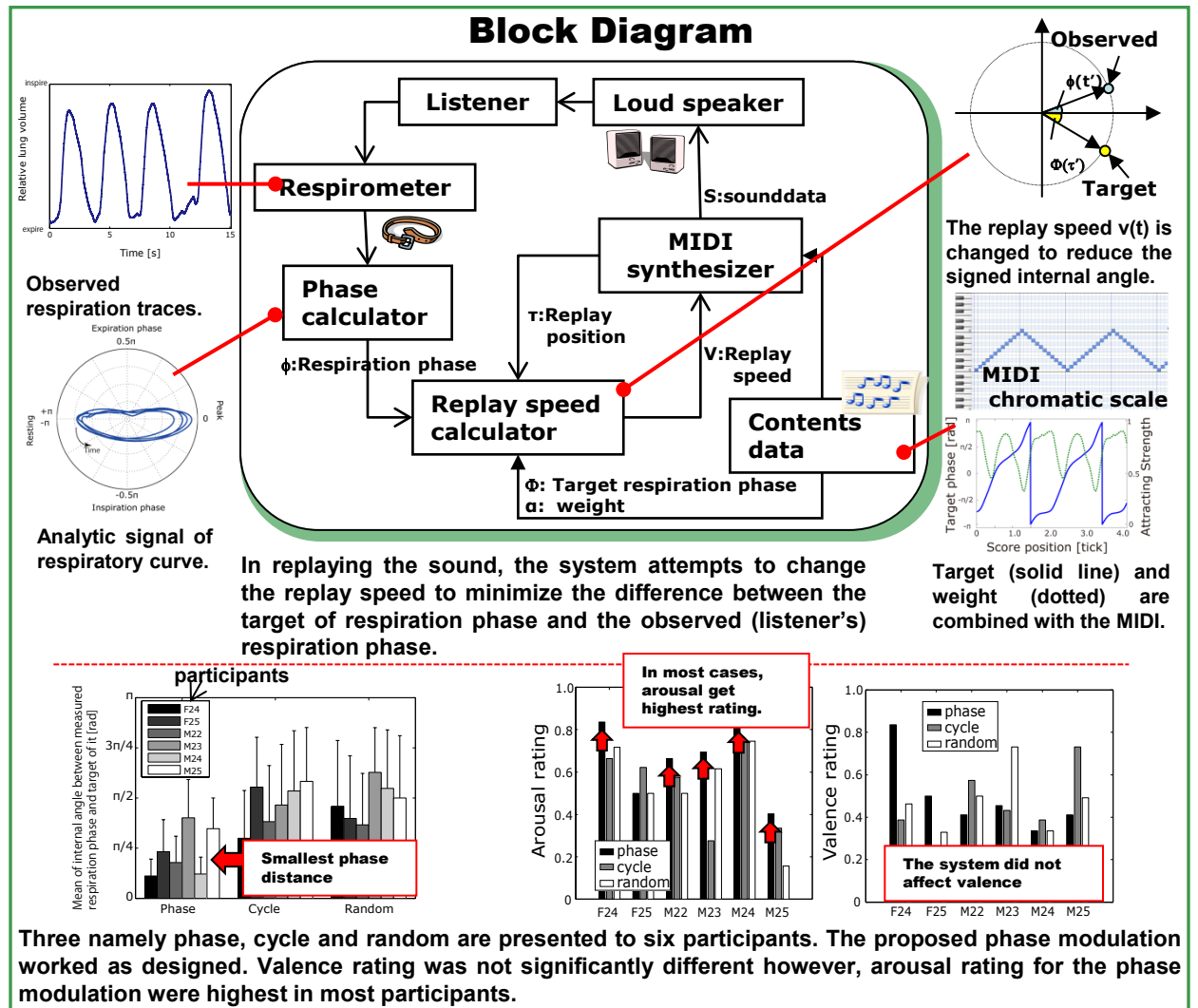




## When breath meets music

### Playback system synchronizing phrases with respiration phases

**Abstract**— We propose a novel sound presentation system that utilizes information about a listener's respiration (breathing). The system we propose was suggested by a result showing that the breathing pattern of experienced listeners changes while they are listening to music. In this system, the replay speed is controlled to realize the idea of listening to a specific part of the score with specific respiration activity. The target respiration and weight were set along the MIDI data to minimize the difference between the target of the respiration phase and the observed (listener's) respiration phase. The flexible synchronization of respiration and phrase has an effect on the arousal of the listener's feelings. The system may give us to a new way of enjoying music and open up a new area in the field of music.



#### Related works

- [1] T. G. Sato, M. Ohsuga, T. Moriya, "Increase in the timing coincidence of a respiration event induced by listening repeatedly to the same music track," *Acoustical Science and Technology*, Vol. 33, No. 4, pp. 255-261, 2012.
- [2] T. G. Sato, Y. Kamamoto, N. Harada, T. Moriya, "A playback system that synchronizes the musical phrases with listener's respiration phases," in *Proc. The ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*, 2013.

#### Contact

**Takashi G Sato** Moriya Research Laboratory  
 E-mail : s.takashi[at]lab.ntt.co.jp (Please replace {at} with @)