

C.F. HUANG, E.J. LIN. **Sonification system for aging Taiwanese people.** *Gerontechnology* 2012;11(2):294; doi:10.4017/gt.2012.11.02.511.00 **Purpose** Aging has become a significant problem in the recent years, due to the aging baby boomers<sup>1</sup>. Most of the supervision systems use vision to perform care functions. However people usually cannot watch video all the time, therefore the proposed sonification<sup>2</sup> for aging Taiwanese is used to express a particular situation at the children or nursing home, including both acoustic instrumental sound for the event-triggered actions, and algorithmic composition<sup>3</sup> to represent various environment situations. The nursing system can easily retrieve their seniors' situation anytime according to the transmitted audio signal and music via a network. **Method** The proposed Chinese music sonification system (CMSS) for older people can be implemented into two sections (*Figure 1*). Section 1: Event-triggered sound is designed using Chinese instrumental audio samples performed by pipa, erhu, etc. Event-triggered sound is based on the input of various actions of aging people, such as watering, exercising, toileting, dining, sleeping, etc. Section 2: Computer-composed music, is designed using automated stochastic process of MIDI-data with various moods and situations mapped into music features, including musical scale, harmony, tonality, and rhythm. There are five Chinese music modes<sup>4</sup> used for the musical scale. Among them Gong, Jiao, and Jiao are closer to the major mode in western music, while Shang and Yu are similar to the minor mode, therefore positive emotions will be mapped into a major-mode music, and the negative emotions will be correlated to a minor-mode music. **Results & Discussion** CMSS is based on the hybrid event-triggered sound and computer composed music. Event-triggered sound is the pre-recorded discrete audio samples, while computer composed music is the calculated continuous MIDI-rendered audio in real-time. A questionnaire is designed for the seniors to listen to the result of the CMSS, and most of them are satisfied with this innovated design. Action data is used for computer composed music calculation via CCD, RF ID, or any other wireless technology, and environment data is determined by sensors such as bio-feedback, temperature, etc., providing data for event-triggered sound. CMSS are implemented with computer music software Max/MSP, to perform CMSS for the seniors living in Taiwan.

**References**

1. Drummonds H. The Aging of the Boomers and the Coming Crisis in America's Changing Retirement and Elder Care Systems. *Lewis & Clark Law Review* 2007;11(267):267-303
2. Ballas A. Delivery of Information through Sound. In: Kramer G, editor. *Auditory Display: Sonification, Audification and Auditory Interfaces*. Reading, MA: Addison-Wesley; 1994; pp 79-94
3. Winsor P. *Automated Music Composition*. Denton, TX: University of North Texas Press; 1992
4. Ho LT, Han KH. On Chinese Scales and National Modes. *Asian Music* 1982;14(1):132-154

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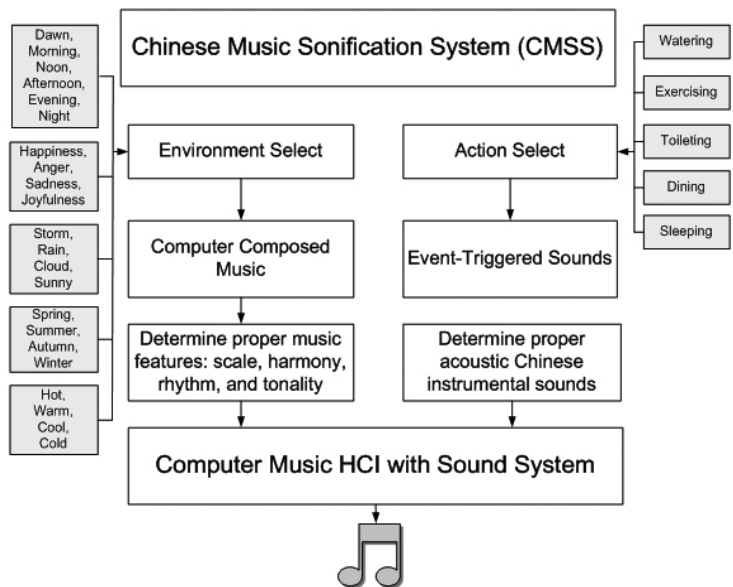


Figure 1. CMSS System for the elder Taiwanese People