

An innovative recreation installation for elderly people

T-G. LIN, H-L. SHIH, P-Y. WU, C-Y. LIANG, C-C. HUANG, C-H. KAO, C-W. LIN, C-T. LEE. **An innovative recreation installation for elderly people.** *Gerontechnology* 2014;13(2):250; doi: 10.4017/gt.2014.13.02.381.00 **Purpose** This work, 'Invitation', is a gentle and soft installation made with translucent materials and tangible elements, such as gauze, needlework, and wooden framing, which all are familiar to the elderly (*Figure 1*). It invites elderly people to travel between their physical and spiritual worlds. Within the installation, elderly people see images reflecting their mental transformation with images derived from instant physiological data. The elderly can stay in the inner or outer spaces of the installation, to see an equilibrium between dynamic and static states of their own minds. **Method** A novel, non-contact, physiological sensor, Nanosecond Pulse Near-field Sensing¹ (NPNS), is applied in this installation. The sensor is in bracelet style, so that it is convenient for elderly adults to use. The bracelet measures the wearer's arterial pulse, and then the bio-signals are transformed into images. The transformation is based on Heart Rate Variability (HRV), which reflects the status of the autonomic nervous system. The images are projected onto one of the gauze screens. When the user becomes aroused with sympathetic system activity, the waves in the image are high and tight. On the contrary, when the parasympathetic system is activated, the waves become slack and slow. The system provides an accompanying rhythm deduced from the heart beats. **Results & Discussion** This recreational installation tries to create a seamless composite of elements art and technology. The heptagonal column provides a private, but translucent, atmosphere and invites the elderly to walk around and get involved. The dynamic images and rhythms deduced from the users' physiological signals provide a unique recreational experience to visualize the users' inner status. A preliminary test of 10 people, aged 50 to 60 years old, showed that they became more relaxed when using the installation. Moreover, these testers reported that they were impressed by the images, and take the animated images as a personal art work from physiological signals. We plan on collaborating with the same continuing care retirement communities (CCRC), to verify the service in real field tests in the near future.

Reference

1. H-D. Lin, Y-S. Lee, H-L. Shih, B-N. Chung. 2013 35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) 2013;4706-4709; doi:10.1109/EMBC.2013.6610598

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Figure 1. The innovative recreation installation helps balancing the physiology and psychology status of elderly people