# *UbiCuts: Wearable communication and surveillance aids*

*S. FOO, N. PANG, X. ZHANG.* ***UbiCuts: Wearable communication and surveillance aids for older adults and the disabled.*** *Gerontechnology 2014;13(2):196;* doi:10.4017/gt.2014.13.02.325.00 **Purpose** Population ageing is widespread across the whole globe. However, current devices that facilitate social communication are not easily accessible to older adults[1]. Our on-going project aims to provide wearable communication and surveillance aids for older adults and the disabled, allowing them to reach their full potential for social and mental well-being and to live independently. **Method** We adopted a user-centred approach to develop our Ubiquitous Shortcuts (UbiCuts) system; it consists of a wearable image/video/voice capturing device and a suite of mobile apps, namely, 'Image, Voice, Video, Emergency and Surveillance'. To use the device, older adults or the disabled simply need to open the app, send a voice message or take a photo/video using the wearable device or a smartphone. A series of commands will be triggered as pre-defined by the older adults or their caregivers. These commands or actions include the ability to send a SMS, activate a phone call, and the ability to post a tweet on Twitter or Facebook and so on. The first workable prototype was completed in August 2013. We conducted two rounds of field studies with older adults living alone in one-room flats in 2012 and 2013. For the second prototype, we plan to integrate the function of image capture into the Samsung smart watch Galaxy Gear, improve the usefulness of UbiCuts by adding another four apps, and enhancing its usability though our understanding user experiences and adaptations through field studies. **Results & Discussion** Our observations and interviews uncovered the barriers and difficulties older adults encountered in using smartphones and reinforced the need to develop a wearable tracking device to provide communication and surveillance aids for them. The first prototype of the wearable image-capturing device is in the shape of a bracelet that supports the capture of images but not videos (*Figures 1* & *2*). The second prototype will be able to capture images, video and voice, and the 'Surveillance' app will be able to monitor both indoor and outdoor safety of older adults and the disabled. The image matching simply requires mere pattern recognition that is more robust; the command sequences can be concatenated to provide flexibility and combinations of commands. The 'Surveillance' app monitors users' safety by simple image comparison among the frames of the recorded video, which is more convenient and flexible in comparison to other fall-detection systems[2,3].

**References**

1. Hill R, Beynon-Davies P, Williams MD. Information Technology & People 2008;21(3):244-266; doi:10.1108/09593840810896019
2. Ghasemzadeh H, Loseu V, Jafari R. IEEE Transactions on Information Technology in Biomedicine 2010;14(2):425-435; doi:10.1109/TITB.2009.2036722
3. Bian ZP, Chau LP, Magnenat-Thalmann N. Fall Detection based on Skeleton Extraction. Proceedings of the 11th ACM SIGGRAPH International Conference on Virtual-Reality Continuum and its Applications in Industry 2012;12(2):91; doi:10.1145/2407516.2407544

*Keywords*: communication & governance, surveillance, wearable device, older adults, disabled
*Address*: COSMIC, Nanyang Technological University, Singapore; *E*: sfoo@ntu.edu.sg

*Figure 1. First prototype of UbiCuts image-capturing device*

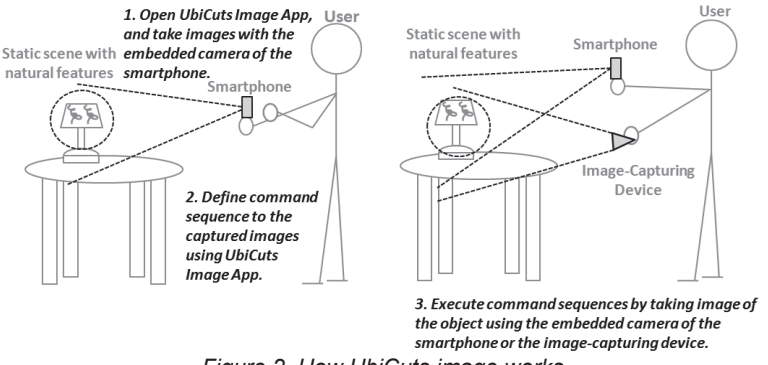


*Figure 2. How UbiCuts image works*