K-C. LAN, J-X. ZHANG, Y-Z. CHEN, M-C. HU. Smartphone-based acupressure using augmented reality for senior care. Gerontechnology 2018;17(Suppl):132s; https://doi.org/10.4017/gt.2018.17.s.128.00 **Purpose** Through the use of augmented reality, the acupuncture points will be displayed directly on the image of the elderly body. In the case of mild symptoms (e.g. hypertension, sleep disorder)[1], with the aid of our proposed system, the elderly can quickly locate the corresponding acupuncture points for the application of massage and relieve their symptoms without the help from TCM physicians. **Method** Our system can be divided into offline (shown in dark gray) and online (shown in gray) processes (*Figure 1 & 2*). We fit a 3D Morphable Face Model (3DMM)[2] to a 2D image and combine facial landmarks and image deformation to estimate acupoints. Since the estimation is based on the fitted model, the estimation of acupoints are consistent across different users. During the offline processes, we annotate facial landmarks and acupoints on the mean model of a 3D morphable model. Then,a in the online processes, we perform face detection on the input image and landmark detection and fit a 3DMM to get a 3D model which can match with the input face. By estimating the pose with 3D and 2D landmark points, the orientation of current 3D face is obtained. We then rotate the 3D face and project landmarks and acupoints into 2D space. Two sets of landmark points are used as control points to perform image deformation[3] and estimate the acupoints. Finally, the estimated acupoints are displayed on the input face. Because most AR devices are portable and have only limited computational power. Therefore, the complexity of the algorithms must be considered in our system. We adopted a real time face alignment algorithm developed in[4] a recently-proposed 3DMM fitting framework[5] to improve the speed of our system. **Results & Discussion** An AR-based system will be presented for localizing the acupuncture points on face images captured by the smartphone. We utilize 3DMM and image deformation to estimate locations of acupoints and show our prototype system is capable of handling various face angles and different face shapes. The high accuracy of the estimation results enables the application of real life symptoms relief. Other than guiding the elderly to apply pressure on the corresponding acupoints to relieve the symptom, the system can also be used as a training or teaching tool for helping the elderly learner to memorize the location of acupoints and corresponding symptoms.

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Keywords: augmented reality, acupuncture point estimation, 3D morphable model, face alignment
Address: Department of Computer Science and Information Engineering National Cheng Kung University, Tainan,Taiwan;
E: klan@csie.ncku.edu.tw

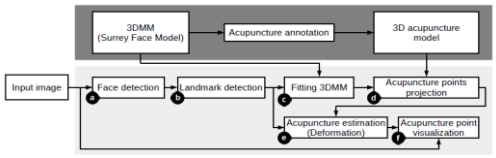

Figure 1. Flow chart of 3D acupuncture point estimation

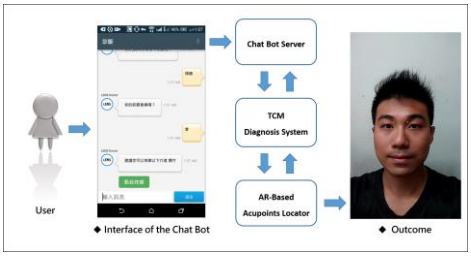

Figure 2. Structure chart of the system