S.C. Hsu, T.E. Wang, H.M. Hua, C.H. Lee. Fingerprint recognition system for the elderly. Gerontechnology 2010;9(2):291; doi:10.4017/gt.2010.09.02.194.00 **Purpose** Biometrics has been a popular issue in the field of image interpretation. In this study, we applied fingerprint technology to discriminate the identity of those elderly persons with specific problems, including memory impairments, behavioural problems, other mental symptoms, and patients' inability to take care of themselves. We recognized these elderly persons efficiently based on their fingerprints, which are always with them and without battery charge problems. However, some particular variables, namely age and moisture, affected the accuracy of fingerprint recognition. We evaluated the fingerprint images of two groups, elderly (65+) and young adult (19-24 years), to measure how age and moisture influences image quality. **Method** The sample consisted of 25 elderly and 25 young adults in Taiwan. To obtain representations for fingerprints, rotation and translation invariance was accomplished by establishing a reference frame based on the intrinsic fingerprint characteristics which are rotation and translation invariant. Based on the three main fingerprint characteristics of principal lines, wrinkles and ridges, a bank of Gabor filters was used to capture both local and global details in fingerprints to get a FingerCode for matching. **Results & Discussion** Of the fingerprint images we collected, we examined the variables age, gender, ethnicity, handedness, moisture content of each index finger, use of hand moisturizers, and prior use of fingerprint devices. Our system performed a verification accuracy at /spl alpha/=0.01. We also found that age does affect image quality, regardless of the device or which index finger was used. Moisture is also affected by age.

References

1. Alexander J, Beecroft AJ, Michael JB. Passive Fingerprinting of Network Reconnaissance Tools. Computer 2009;42(12):91-93
2. Sickler NC, Elliott SJ. Fingerprint Image Quality Evaluation: Elderly and Younger Populations. West Lafayette: Purdue University; 2006
3. Zhou SZ. Construct an Audit System for Network Resource Management in Open Space. Taipei: Tamkang University; 2009
4. Liu SJ ,Improved Algorithms for Identifying Gene Teams of Genomes and Common Connected Components of Interval Graphs. National Tsing Hua University; 2009
5. Li KC ,Towards Building A Fingerprint-Based Verification System. National Tsing Hua University; 2008

Keywords: biometrics, finger code, fingerprints, Gabor filters

Address: Nan Kaii University of Technology, 568, Chung Cheng Road, Tsao Tun, Nan Tou, Taiwan; E: 98mn002@nkut.edu.tw