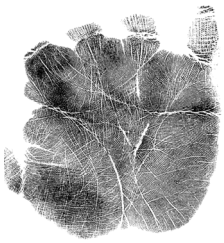
Josef Ressel Center for User-friendly Secure Mobile Environments (u‘smile)
University of Applied Sciences Upper Austria
FH OÖ Forschungs&Entwicklungs GmbH

Master's Thesis: Mobile Palmprint Recognition

Contact
Rainhard Findling
Mobile Authentication, Biometrics, and Machine Learning
Softwarepark 11
A-4232 Hagenberg/Austria
+43 (0)50804-27188
rainhard.findling@fh-hagenberg.at
www.usmile.at • www.fh-ooe.at

Motivation

Palmprint recognition [1] is a form of biometric recognition [2] that distinguishes people by their palmprint patterns. There exist offline (ink) and online (digital image) palmprint recognition approaches – we focus on online ones here. Palmprint recognition usually features image acquisition, image preprocessing, feature derivation and feature classification [3-5]. As mobile devices feature increasingly higher quality cameras, palmprint recognition becomes more interesting on mobile devices as well.
We are interested in successfully identifying people using their palmprint on mobile devices – e.g. a digital photo of the palm region of their hand, taken with their mobile phone. The approach should be implemented as Android App and evaluated using a small, self recorded, mobile device palmprint database.


[wikimedia.org]

Goals

- A suitable palmprint recognition approach should be selected, prototypically implemented and demonstrated to work on existing palmprint data (e.g. publicly available palmprint database).
- A mobile palmprint sample database should be recorded. Therefore, a palmprint recording App should be implemented. The DB should contain multiple palmprint recordings per user. It should be used to evaluate and fine tune the already implemented palmprint recognition approach for mobile palmprint data.
- The final, evaluated palmprint recognition aproach should be implemented as Android App (e.g. by extending the previously implemented palmprint recording App).

Research questions

- What are the requirements for practically applicable mobile palmprint recognition and their systems? Can existing mobile hardware (e. g. phones) be used (or extended) to perform mobile palmprint recognition?
- Which palmprint recognition approaches are suitable for mobile palmprint authentication?
- Using the implemented approach, which recognition performance can realistically be expected in a mobile palmprint recognition scenario – in contrast to publicly available, non-mobile palmprint data?

Literature

[1] Palm print, https://en.wikipedia.org/wiki/Palm_print
[2] Biometrics, http://en.wikipedia.org/wiki/Biometrics
[3] David D. Zhang, 2004. Palmprint Authentication. 241p, Springer Science & Business Media, Springer. Online: https://books.google.at/books/about/Palmprint_Authentication.html?d=i4tdShJALfA0C&hl=de
[4] David Zhang, Guangming Lu, Adams Wai-Kin Kong, Michael Wong, 2005. Palmprint Authentication Technologies, Systems and Applications. In Advances in Biometric Person Authentication, Lecture Notes in Computer Science, 3338, 2005, 78-89. Palmprint Authentication Technologies, Systems and Applications. Online: http://link.springer.com/chapter/10.1007%2F978-3-540-30548-4_10
[5] Adams Kong, David Zhang, Mohamed Kamel, 2009. A survey of palmprint recognition. In Pattern Recognition, 42(7), 1408-1418. Online: http://dl.acm.org/citation.cfm?id=1518403