



Diploma Thesis

Image enhancement in the area of fingerprint detection

Project description

One of the fast growing fields in economy is security systems and one particular area is the detection of fingerprints. Due to their ease of use and size thermo-sensors are common, however they provide sometimes a poor image quality. Furthermore person dependent features like folds and scars pose obstacles and result in an unclear alignment of the normally parallel lines within a finger.

In this diploma thesis it should be investigated if some methods from modern image processing, in particular anisotropic diffusion but also others, can help to significantly improve the image quality and therefore also the detection rates. (The latter is not part of the project.)

Prerequisites

Some knowledge in at least one of the following areas is mandatory:

- Image processing
- Solving PDE's

Supervisors

Dr. Frank Bauer

Roland Richter

Prof. Peter Klement

Literature

Aubert, G. and Kornprobst, P. *Mathematical Problems in Image Processing: Partial Differential Equations and the Calculus of Variations (second edition)*, 2006, Springer-Verlag, New York

Chikkerur, S., Cartwright, A. and Govindaraju, V. *Fingerprint enhancement using STFT analysis*, Vol 40, No 1, pp. 198-211 , 2007

Hong, L., Wan, Y. and Jain, A. *Fingerprint Image Enhancement: Algorithm and Performance Evaluation*, IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol 20, No 8, 1998

Weickert, J., *Anisotropic diffusion in image processing*, 1998, B. G. Teubner, Stuttgart

Contact

Dr. Frank Bauer
Institut für Wissensbasierte Math. Systeme
Johannes Kepler Universität Linz
A-4040 Linz
Tel. +43 (0)732 2468 9195
Fax +43 (0)732 2468 1351
E-Mail frank.bauer@jku.at