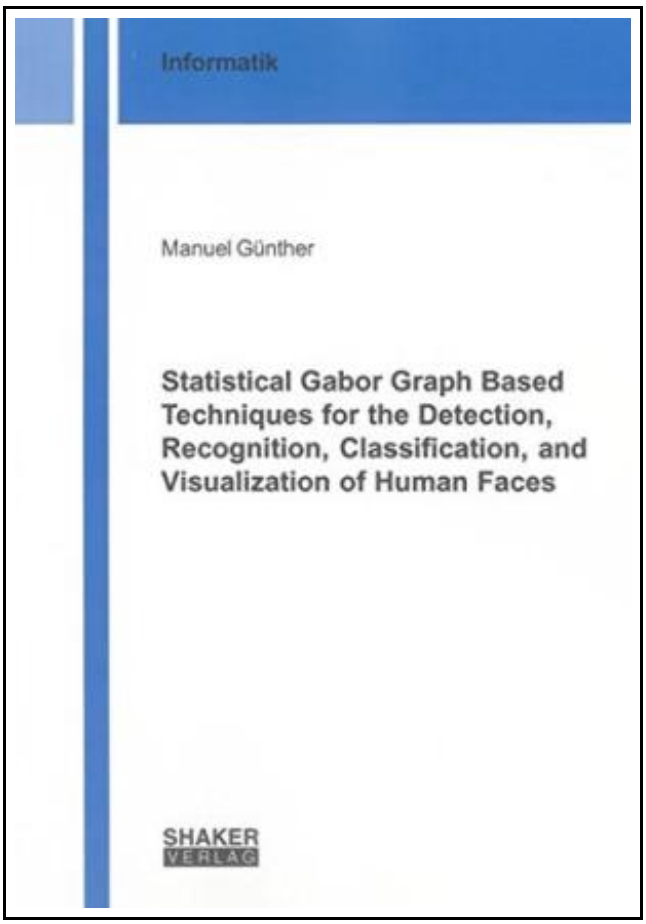
# Statistical Gabor Graph Based Techniques for the Detection, Recognition, Classification, and Visualization of Human Faces

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***(Rebecca Bechtelar)***

# STATISTICAL GABOR GRAPH BASED TECHNIQUES FOR THE DETECTION, RECOGNITION, CLASSIFICATION, AND VISUALIZATION OF HUMAN FACES



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Shaker Verlag Mai 2012, 2012. Buch. Book Condition: Neu. 21x14.8x cm. Neuware - In this work, I focus in a simple parameter-free statistical model that requires few training data and can be trained fast. I show that the model is well suited for face detection, person identification, and classification of facial properties. For face detection, the well known elastic bunch graph matching algorithm is adapted to learn appearance probabilities of facial features. Furthermore, texture features are transformed to be used for the detection of faces in different sizes and in-plane rotation angles. In order to place facial landmarks more reliably and to increase face recognition accuracy, images are automatically standardized according to the found scale and angle of the face. It is shown that both extensions of the elastic bunch graph matching algorithm work well with only few hand-labeled training examples and that the face detection can be accelerated. After applying small changes to the model, it can be employed for identifying a person that is shown in an image. In opposition to other state-of-the-art identification algorithms, the model learns how two facial images can be compared most reasonably. For both the intrapersonal and the extrapersonal class, each one statistical model is approximated. The intrapersonal class consists of comparisons of images showing the same person, while the extrapersonal class contains image comparisons of different identities. Utilizing face graphs, it is shown empirically that the statistical model is able to reliably recognize faces in different sizes and with different facial expressions. Identification under illumination variation is still a tough problem, but it is illustrated that the proposed model is indeed able to outperform state-of-the-art face recognition approaches. This is also reached by exploiting parts of the texture descriptors that are ignored by most current algorithms. The very same model is employed...

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