Psoriasis
Psoriasis is a persistent skin disease which inflames the skin producing red and thickened areas with silverly scales. Dermatologists score psoriasis by examining these structures in the skin, nails and scalp. These scores allow the doctor to follow the treatment. The aim of this work is to do a segmentation of the main structures of the skin images. These segmentations can afterwards be used for making an automatic generation of the scores. Below some examples of psoriasis are shown.

Gabor filters
Preliminary studies show that the main problem in doing the segmentation is the scaling. Using only the RGB-intensities as features the scaling is almost indistinguishable from light normal skin. To overcome this problem Gabor filters are introduced to pick up the texture of the scaling. The images are filtered with Gabor kernels in several directions, and while the scaling does not have any specific direction those contributions are added together afterwards to give the texture feature. To enhance the small variations in the generated power spectra, we used the logarithm of those. Examples of these Gabor features are shown in the next figure.

The Extended Potts Model
Instead of using a simple Bayesian classifier, the Potts model is used to include the local context. The model is extended to include prior knowledge of the contextual relations between different classes. This is done by using a Combined Class Neighbourhood shown below. Pixels belonging to the neighbourhood should most likely be of the same class. In case of scaling, the pixels belonging to Class 2 should most likely be red skin because scaling normally are small and appear on red skin.

Results
The figure below shows the obtained results. The top row displays the results after a discriminant analysis and the bottom row shows the result after using the extended Potts model with the results obtained by the discriminant analysis. The used features are a Gabor filter and the RGB values. The interesting areas, red and scales, are classified in a satisfactory way. Furthermore, it can be observed that initial misclassifications made by the discriminant analysis are handled by the extended Potts model.

Conclusions
It has been shown that the described approach produces a good segmentation of the red and the scaled areas. The obtained results are suitable for automatic grading of psoriasis images. Taking into account other skin types such as white, brown and normal skin, could be considered for improving the results.