



## OBERSEMINAR BILDVERARBEITUNG, COMPUTERSEHEN UND COMPUTERGRAPHIK

### Modeling of Image Variability for Recognition

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We present the application of different models of image variability to visual recognition problems using the paradigm of appearance-based recognition. We discuss linear deformation models and discrete deformation models of order zero, one, and two. For the discrete models, which map pixels to pixels, we observe that it is important to include a suitable context for each pixel. The models are applied to the tasks of handwritten character recognition and the categorization of medical images, yielding state-of-the-art results in both cases. In particular we achieve an error rate of 0.5% on the well-known MNIST benchmark. Finally, we can show that the models of image variability also improve the recognition performance of appearance-based sign language and gesture recognition systems, which underlines their broad applicability.

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