

# Prototype-Based Classifiers and Their Application in the Life Sciences

Michael Biehl

Univ. of Groningen - Johann Bernoulli Inst. for Math. and Computer Science  
P.O. Box 407, 9700 AK Groningen - The Netherlands

**Abstract.** This talk reviews important aspects of prototype based systems in the context of supervised learning. Learning Vector Quantization (LVQ) serves as a particularly intuitive framework, in which to discuss the basic ideas of distance based classification. A key issue is that of choosing an appropriate distance or similarity measure for the task at hand. Different classes of distance measures, which can be incorporated into the LVQ framework, are introduced. The powerful framework of relevance learning will be discussed, in which parameterized distance measures are adapted together with the prototypes in the same training process. Recent developments and theoretical insights are discussed and example applications in the bio-medical domain are presented in order to illustrate the concepts.