# Regularization methods in inverse problems and machine learning

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Regularization methods are at the heart of the solution of inverse problems and are of increasing importance in modern machine learning. In this talk we will discuss the modern theory of (nonlinear) regularization methods and some applications. We will put a particular focus on variational and iterative regularization methods and their connection with learning problems: we discuss the use of such regularization methods for learning problems on the one hand, but also the current route of learning regularization methods from data.