

(Higher-Order) Graphical Models for Inference and Learning in Artificial Vision

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Inverse modeling aims at recovering the set of parameters of a parametric model such that the resulting instance optimally explains the observations/measurements. Such a formulation is often addressed as an optimization problem of an appropriately defined objective function that is in most of the cases is an ill-posed, highly non-linear and highly non-convex problem. In this seminar, we will investigate the use of graphical models (low and higher order rank) to address such inference and present efficient optimization algorithms that can produce either computational efficient near-optimal solutions or optimal ones through tight relaxations and dual decomposition even for higher order models.

The domain of medical imaging and computer vision (segmentation/registration/matching & beyond) will be used to demonstrate the extreme potentials of such modeling and inference methods.