Erich Kobler (University Hospital Bonn)

Learning Gradually Non-convex Image Priors Using Score Matching

In this talk, we discuss a unified framework of denoising score-based models in the context of graduated non-convex energy minimization. We show that for sufficiently large noise variance, the associated negative log density – the energy – becomes convex. Consequently, denoising score-based models essentially follow a graduated non-convexity heuristic. We apply this framework to learning generalized Fields of Experts image priors that approximate the joint density of noisy images and their associated variance. These priors can be easily incorporated into existing optimization algorithms for solving inverse problems and naturally implement a fast and robust graduated non-convexity mechanism.