

Off-the-grid and continuous methods for optimization and inverse problems in imaging

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A few years of non-convex off-the-grid estimation

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In this talk, we focus on non-convex approaches for off-the-grid spike estimation. Centered around the study of basins of attraction of a non-convex functional, we explain how the study of recovery guarantees can be generally linked with the number of available measurements. With a general result on non-convex estimation of low-dimensional models, we show that the size of basins of attraction explicitly increases with respect to the number of measurements, with tight bounds for spikes recovery. These results lead to the conception of a fast algorithm for the recovery of many off-the-grid spikes: over-parametrized projected gradient descent (OP-PGD), showing promising results on realistic datasets. We also are able to give a theoretical partial control of the quality of continuous orthogonal matching pursuit without sliding which is the initialization procedure of OP-PGD.

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