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Optimization in mean-field and spatial models

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I will discuss some results on optimization problems on graphs with random edge weights, in particular minimum matching and the traveling salesman. For mean field models, that is, when inter-point distances are i.i.d. variables, there are very precise results (some proved and some conjectured) about the total cost and local statistics of the optimum solution. For spatial models like Poisson point processes and disordered lattices, the corresponding results are quantitatively less precise. I will discuss some methods that have been successful in mean field models, and how they can perhaps shed some light also on other models.