Locally-informed proposals in Metropolis-Hastings algorithm with applications

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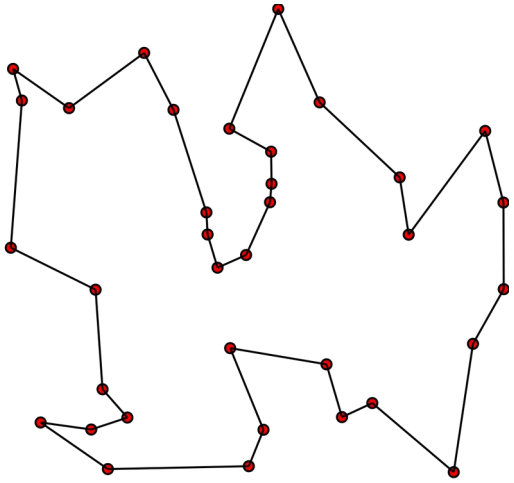

Figure 1: Traveling salesman problem, source: wiki.

The Markov Chain Monte Carlo methods (abbrv. MCMC) are a family of algorithms used for approximating sampling from a given probability distribution. They prove very efective when the state space is large. This fact can be used to solve many hard deterministic problems - one of them being traveling salesmen problem, which asks for the shortest path that visits all of the cities exactly once. It will be used in this presentation to test a new approach of locally-informed proposals as a modifcation of well known Metropolis-Hastings algorithm. This approach uses locally computed distribution, that changes depending on candidate, at each step of Metropolis-Hastings algorithm. We will present the implementation of modified algorithm, experiments based on it, results and a comparison with previous MCMC methods.

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