# Evolutionary optimization by distribution estimation with. mixtures of factor Analyzers

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Evolutionary optimization algorithms based on the probability models have been studied to capture the relationship between variables in the given problems and finally to find the optimal solutions more efficiently. However, premature convergence to local optima still happens in these algorithms. Many researchers have used the multiple populations to prevent this ill behavior since the key point is to ensure the diversity of the population. In this paper, we propose a new estimation of distribution algorithm by using the mixture of factor analyzers (MFA) which can cluster similar individuals in a group and explain the high order interactions with the latent variables for each group concurrently. We also adopt a stochastic selection method based on the evolutionary Markov chain Monte Carlo (eMCMC). Our experimental results support that the presented estimation of distribution algorithms with MFA and eMCMC-like selection scheme can achieve better performance for continuous optimization problems.

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# Blocked Stochastic sampling versus estimation of distribution algorithms

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The Boltzmann distribution is a good candidate for a search distribution for optimization problems. In this paper we compare two methods to approximate the Boltzmann distribution-Estimation of Distribution Algorithm's (EDA) and Markov Chain Monte Carlo methods (MCMC). It turns out that in the space of binary functions even blocked MCMC methods outperform EDA on a small class of problems only. In these cases a temperature of T = 0 performed best.

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