

Abstract

This work presents the use of copulas and vines in Estimation of Distribution Algorithms (EDA). EDA are evolutionary optimization algorithms based on the estimation and the simulation of probability distributions. Copulas are functions used to describe the dependence structure of probability distributions. Vines are graphical models that represent high-dimensional distributions by factorizing multivariate densities into bivariate copulas and marginal densities. The Vine Estimation of Distribution Algorithm (VEDA) is introduced. VEDA models the search distributions using vines. The algorithm is executed in a group of standard test problems. The experimental results show that VEDA offers new possibilities for the optimization of problems with complex patterns of dependence.