The paper considers the algorithms for solving the multidimensional global optimization problems using decision tree to reveal the attraction regions of the local minima. We suppose, that the target function is defined as a “black box” and satisfied Lipschitz condition with unknown constant. We propose a method for selecting the local extrema neighborhood of the target function based on analysis of accumulated search information using machine learning methods. This allows us to make a decision to run a local method, which can speed up the convergence of the algorithm. The proposition was confirmed by the results of numerical experiments demonstrating the speedup when solving a series of test problems.