

Parameterized complexity is a part of computer science dealing with the computational complexity of problems measured not only by the length of their input but also some parameter of the input. Neighborhood diversity is a recently introduced parameter describing a certain structure of a graph. This parameter is attractive for research especially because some problems which are hard with respect to other parameters that are incomparable with neighborhood diversity become fixed-parameter tractable with respect to neighborhood diversity. In this thesis we show fixed-parameter tractability for three problems that are hard with respect to treewidth. This constitutes the main part of this thesis and it is our original work. Next it contains an overview of other interesting problems and also a survey of the state of the art in the area of parameters for sparse and dense graphs.