针对于变异测试开销过大的这个问题，国内外的很多学者对于变异测试优化这一领域进行了一系列的研究并取得了一些成果。对已有的工作进行总结，将变异测试优化技术分为变异体选择优化和变异体执行优化两个模块。在变异体选择优化模块中，将现有的优化方法分成随机选择法、聚类选择法、变异算子选择法、高阶变异优化法以及程序分析法五个方面，并进行分类总结；在变异体执行优化模块中，从变异体检测优化、变异体编译优化以及并行执行变异体三个角度总结分类现有研究成果。最后对变异测试优化的未来研究方向进行展望。

Directed against the problem that mutation testing has occasion to excessive cost, a series of research have been conducted on mutation testing optimization by scholars globally. Summarizing the existing work and achievements, we can divide mutation testing optimization technology into two modules, which are called mutation selection optimization and mutation execution optimization. In the module “mutation selection optimization” , the existing methods are divided into five aspects: random selection method, cluster selection method, mutation operator method, high-order mutation optimization method and program analysis method. On this basis, we will summarize by the classification. In the module “mutation execution optimization” , we sort and summarize existing research results from the perspective of mutation detection optimization, mutation compilation optimization and parallel execution mutation. At last, we will foresee and outlook the future research direction to mutation testing optimization.