Performance Evaluation of Multi-instance Template Matching in a Multi-objective Optimization view

Liding Xu[1]

[1]Department of Intelligence Science and Technology, Peking University

11/1/2017

Abstract

Template matching is now applied to various computer vision and image processing systems, and there is an increasing demand for multi-instance template matching. In order to achieve high precision and recall in practical application problems, however, more than one template matching techniques are used. The system usually outputs instances matched by these techniques simultaneously. In the optimization view, it involves optimizing multiple objective functions, hence, it is a multi-objective optimization problem. For a nontrivial multi-objective optimization problem, no single solution exists such that simultaneously optimizes each objective. In addition, there are usually multiple Pareto optimal solutions for multi-objective optimization problems, so it is not straightforward as conventional single-objective optimization problem. Therefore, there are various ways of defining 'solving an multi-objective optimization problems'. The purpose of this paper is to discuss the correlated property of objective functions of template matching techniques, compare various definitions of multi-objective optimization problems and their optimization algorithms and assess their experimental performance on several benchmarks.