Department of Computer Science

COMPUTER SCIENCE SEMINAR SERIES

Adaptive Weights Generation for Decomposition-Based Multi-Objective Optimization Using Gaussian Process Regression

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VENUE CS Seminar Room, Y6405
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ABSTRACT

By transforming a multi-objective optimization problem into a number of single-objective optimization problems and optimizing them simultaneously, decomposition-based evolutionary multi-objective optimization algorithms have attracted much attention in the field of multi-objective optimization. In decomposition-based algorithms, the population diversity is maintained by using a set of predefined weight vectors, which are often evenly sampled on a unit simplex. However, when the Pareto front of the problem is not a hyperplane but more complex, the distribution of the final solution set will not be that uniform. In this paper, we propose an adaptive method to periodically regenerate the weight vectors for decomposition-based multi-objective algorithms according to the geometry of the estimated Pareto front. In particular, the Pareto front is estimated via Gaussian process regression. Thereafter, the weight vectors are reconstructed by sampling a set of points evenly distributed on the estimated Pareto front. Experimental studies on a set of multi-objective optimization problems with different Pareto front geometries verify the effectiveness of the proposed adaptive weights generation method.

This paper will be presented at The Genetic and Evolutionary Computation Conference (GECCO 2017), 15 July ~ 19 July, Berlin, Germany.

Supervisor: Prof KWONG Tak Wu Sam
Research Interests: Evolutionary Multi-Objective Optimization

All are welcome!

In case of questions, please contact Prof KWONG Tak Wu Sam at Tel: 3442 2907, E-mail: cssamk@cityu.edu.hk, or visit the CS Departmental Seminar Web at http://www.cs.cityu.edu.hk/news/seminars/seminars.html.