

## A Parallel Tabu Search for the Unconstrained Binary Quadratic Programming Problem

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**DATE** 22 May 2017 (Monday)

**TIME** 3:00 pm - 3:30 pm

**VENUE** G7315, 7th Floor  
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### ABSTRACT

Although several sequential heuristics have been proposed for dealing with the Unconstrained Binary Quadratic Programming (UBQP), very little effort has been made for designing parallel algorithms for the UBQP. This paper propose a novel decentralized parallel search algorithm, called Parallel Elite Biased Tabu Search (PEBTS). It is based on DDTs, a state-of-the-art sequential UBQP metaheuristic. The key strategies in the PEBTS algorithm include: (i) a lazy distributed cooperation procedure to maintain diversity among different search processes and (ii) finely tuned bit-flip operators which can help the search escape local optima efficiently. Our experiments on the Tianhe-2 supercomputer with up to 24 computing cores show the accuracy of the efficiency of PEBTS compared with a straightforward parallel algorithm running multiple independent and non-cooperating DDTs processes.

This paper will be presented at IEEE Congress on Evolutionary Computation 2017 (CEC 2017), June 5-8, San Sebastián, Spain

Supervisor: Prof ZHANG Qingfu

Research Interests: Evolutionary Computation; Multiobjective Optimization; Computational Intelligence; Metaheuristics; Machine Learning

**All are welcome!**



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