

Title: Evolutionary Algorithms for the Set K-Cover Problem

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Abstract:

Evolutionary algorithms (EAs) have shown their great power in various search and optimization problems. This talk introduces our recent work on design of EAs for the Set K-Cover problem and its application to lifetime extension of wireless sensor networks. The Set K-Cover problem aims for the maximum number of covers given a collection of subsets of a finite set. This problem has been proved to be NP-Complete. We have proposed effective memetic algorithms to deal with this problem. The memetic algorithms utilize Darwinian evolutionary scheme and Lamarckian local enhancement to search for optima in consideration of global exploration and local exploitation. The experimental results indicate that the proposed memetic algorithms significantly outperform several heuristic and evolutionary algorithms in terms of solution quality and running time.

Short Bio:

Chuan-Kang Ting received the B.S. degree from National Chiao Tung University, Taiwan, the M.S. degree from National Tsing Hua University, Taiwan, and the Dr. rer. nat. degree from the University of Paderborn, Germany. He is currently an Associate Professor at the Department of Computer Science and Information Engineering, National Chung Cheng University, Taiwan. His research interests include evolutionary computation, memetic computing, metaheuristic algorithms, multi-objective optimization, and creative intelligence. He is an associate editor of IEEE Computational Intelligence Magazine and an editorial board member of Soft Computing and Memetic Computing journals. He chaired the AI Forum 2012 and co-chaired the 2013 IEEE Symposium on Computational Intelligence for Creativity and Affective Computing. He has served in the organization committees over 30 international conferences, workshops, and special sessions.