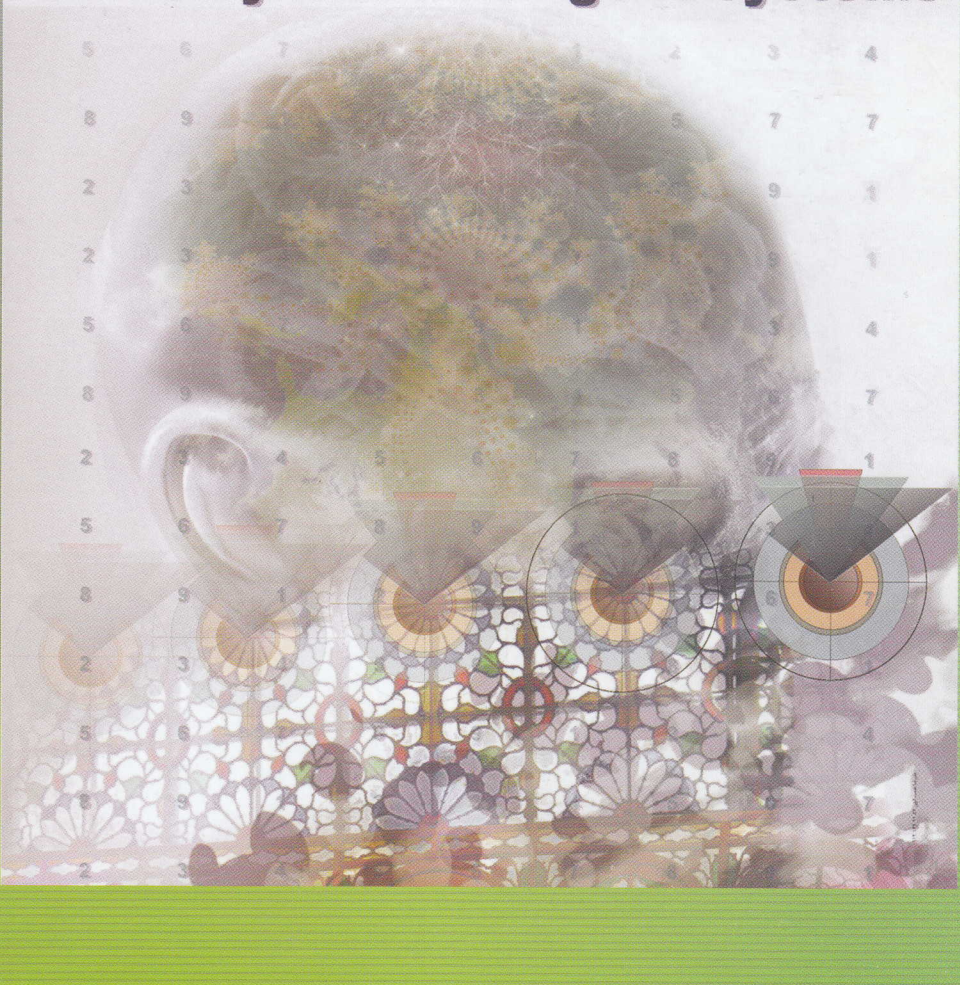
Abstracts

15-17 July 2009
Yazd University - Yazd - Iran

سومین کنگره مشترک سیستم‌های فازی و هوشمند

3rd Joint Congress on Fuzzy and Intelligent Systems



انجمن سیستمهای هوشمند ایران
Intelligent Systems Scientific Society of Iran

انجمن سیستم های فازی ایران

سومین کنگره مشترک سیستم های فازی و هوشمند
3rd Joint Congress on Fuzzy and Intelligent Systems

دانشگاه یزد

Reducing the Search Space in Evolutionary Optimization Using Computing with Words and Perceptions

Alireza Rowhanimanesh
Cognitive Computing Lab, Dept. of Electrical Eng.,
Ferdowsi University of Mashhad
rowhanimanesh@ieee.org

Mohammad-R. Akbarzadeh-T
Cognitive Computing Lab, Dept. of Electrical Eng.,
Ferdowsi University of Mashhad
akbarzadeh@ieee.org

Abstract: A general characterization of evolution-based optimization is its blindness towards the optimization landscape. While this can be an asset for a better global search, it inhibits their computational efficiency which becomes highly limiting for very large search spaces. In contrast to evolution, a human-like rational search would first try to achieve some general and approximate information about the search space before the search begins. While this information may be imprecise, human complements it with approximate reasoning to reduce the size of the search space as much as possible. In this paper, we apply computing with words and perceptions to add this human-like rationality to evolutionary optimization methods to efficiently reduce the search space, and then the evolutionary method begins the search in the reduced space. The proposed method is applied to two sets of problems and compared with conventional GA. The results demonstrate that the proposed approach significantly increases the speed of the evolutionary optimization methods, especially when the search space is very large and complex.

Keywords: Computing with Words and Perceptions, Extension Principle, Evolutionary Optimization, Reduced Search Space.

Comparison of MOGA with Greedy Algorithms in Soft Real-time Task Scheduling on Heterogeneous Processors with Communication Delay

Nafiseh Sedaghat
Department of Artificial Intelligence,
Islamic Azad University Mashhad Branch
nf_sedaghat@yahoo.com

Hamid Tabatabaee -Y
Department of Computer Engineering,
Islamic Azad University Qouchan Branch
hamid.tabatabaee@gmail.com

M. R. Akbarzadeh -T
Department of Electrical Engineering, Ferdowsi University of Mashhad
akbarzadeh@ieee.org

Abstract: Scheduling of real-time tasks on a multiprocessor system is an NP-hard problem. This paper aims to propose an algorithm based on multi-objective GA (MOGA) for scheduling of static soft real-time tasks on a heterogeneous multi-processor system when the real-world constraints including the precedence relationship between tasks, different arrival time for each task as well as communication delays between the processors are all considered. The objectives of the proposed scheduling algorithm are maximizing system utilization and minimizing total tardiness. Since these objectives are conflicting, the proposed method applies adaptive weight approach (AWA) where some useful information from the current population is utilized to readjust the weights for obtaining a search pressure toward a positive ideal point. In this paper, we also propose two greedy algorithms in which each algorithm aims to optimize a single objective either idle time or communication delay. The performance of the proposed MOGA is compared with the performance of the greedy algorithms