P.O.Box 8718, Beijing 100080, China	Journal of Software, Oct. 2006,17(10):2029-2039
E-mail: jos@iscas.ac.cn	ISSN 1000-9825, CODEN RUXUEW, CN 11-2560/TP
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分布式约束满足问题研究及其进展

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Received 2006-03-09; Accepted 2006-05-08

Abstract
With the rapid development and wide application of the Internet technology, many problems of Artificial Intelligence, for example scheduling, planning, resource allocation etc., are formally distributed now, which turn into a kind of multi-agent system problems. Accordingly, the standard constraint satisfaction problems turn into distributed constraint satisfaction problems, which become the general architecture for resolving multi-agent system. This paper first briefly introduces the basic concepts of distributed CSPs, and then summarizes the basic and the improved algorithms. Their efficiency and performance are analyzed and the typical applications of distributed CSPs in recent years are discussed. Finally, this paper presents the extensions of the basic formalization and the research trends in this area. Recent related work indicates that the future work will focus on the theoretical research to present the solid theoretical foundation for the practical problems.

Wang QH, Chen EH, Wang XF. Research and development of distributed constraint satisfaction problems. *Journal of Software*, 2006,17(10):2029-2039.
DOI: 10.1360/jos172029
http://www.jos.org.cn/1000-9825/17/2029.htm

摘要
近年来,随着网络技术的快速发展和广泛应用,人工智能领域中的诸多问题,如时序安排、计划编制、资源分配等,越来越多地以分布形式出现,从而形成一类多主体系统.相应地,求解该类问题的传统约束满足问题也发展为分布式约束满足问题,分布式约束满足已经成为多主体系统求解的一般框架.首先,简要介绍了分布式约束满足问题的基本概念,总结了该问题的基本算法及其改进算法,并对这些算法的效率和性能进行了比较分析.然后,讨论了近年来分布式约束满足问题的若干典型应用;最后,给出了分布式约束满足问题基本形式的扩展和今后的研究方向.分布式约束满足问题最新研究进展表明:今后的工作将着重于面向现实问题求解的理论研究,为实际应用提供坚实的理论基础.

基金项目：Supported by the National Natural Science Foundation of China under Grant No.60573077 (国家自然科学基金); the Program for New Century Excellent Talents in University of China under Grant No.NCET-05-0549 (新世纪优秀人才支持计划)

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