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Plenary Lecturer II

Ant colony optimization pheromone correction strategies

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Abstract

Most real-life problems can be represented as some kind of optimization problem. Easy optimization problems were solved long time ago so nowadays only hard problems are of research interest. Many discrete (combinatorial) as well as some continuous optimization problems are intractable, but of great practical interest. The oldest way to deal with such problems is Monte-Carlo method. Nature inspired metaheuristics simulate various natural phenomena. We talk about bee colony food finding or ant colony path finding but in essence, in all these diverse mimicking, we do two things. We exploit good found solutions but also go to unknown places in order to avoid being trapped in local minima. The successfulness of any algorithm is determined by proper balance between exploitation and exploration. This paper examines ant colony pheromone correction strategies which change exploitation and exploration behavior of the original algorithm and applies these strategies to some combinatorial problems.

Brief Biography of the Speaker: Milan Tuba received B. S. in Mathematics, M. S. in Mathematics, M. S. in Computer Science, M. Ph. in Computer Science, Ph. D. in Computer Science from University of Belgrade and New York University. From 1983 to 1994 he was in the U.S.A. first as a graduate student and teaching and research assistant at Vanderbilt University in Nashville and Courant Institute of Mathematical Sciences, New York University and later as an Assistant Professor of Electrical Engineering at Cooper Union Graduate School of Engineering, New York. During that time he was the founder and director of Microprocessor Lab and VLSI Lab, leader of scientific projects and supervisor of many theses. From 1994 he was Associate professor of Computer Science and Director of Computer Center at University of Belgrade, Faculty of Mathematics, and from 2004 also a Professor of Computer Science and Dean of the College of Computer Science, Megatrend University Belgrade. He was teaching more than 20 graduate and undergraduate courses, from VLSI Design and Computer Architecture to Computer Networks, Operating Systems, Image Processing, Calculus and Queuing Theory. His research interest includes mathematical, queuing theory and heuristic optimizations applied to computer networks, image processing and combinatorial problems. He is the author of more than 100 scientific papers and a monograph. He is coeditor or member of the editorial board or scientific committee of number of scientific journals and conferences. Member of the ACM since 1983, IEEE 1984, New York Academy of Sciences 1987, AMS 1995, SIAM 2009.