

Table of Contents

A Comparison Between ACO Algorithms for the Set Covering Problem . . .	1
<i>Lucas Lessing, Irina Dumitrescu, and Thomas Stützle</i>	
A VLSI Multiplication-and-Add Scheme Based on Swarm Intelligence Approaches	13
<i>Danilo Pani and Luigi Raffo</i>	
ACO for Continuous and Mixed-Variable Optimization	25
<i>Krzysztof Socha</i>	
An Ant Approach to Membership Overlay Design	37
<i>Vittorio Maniezzo, Marco Boschetti, and Mark Jelasity</i>	
An Ant Colony Optimisation Algorithm for the Set Packing Problem	49
<i>Xavier Gandibleux, Xavier Delorme, and Vincent T'Kindt</i>	
An Empirical Analysis of Multiple Objective Ant Colony Optimization Algorithms for the Bi-criteria TSP	61
<i>Carlos García-Martínez, Oscar Cerdón, and Francisco Herrera</i>	
An External Memory Implementation in Ant Colony Optimization	73
<i>Adnan Acan</i>	
BeeHive: An Efficient Fault-Tolerant Routing Algorithm Inspired by Honey Bee Behavior	83
<i>Horst F. Wedde, Muddassar Farooq, and Yue Zhang</i>	
Competition Controlled Pheromone Update for Ant Colony Optimization	95
<i>Daniel Merkle and Martin Middendorf</i>	
Cooperative Transport of Objects of Different Shapes and Sizes	106
<i>Roderich Groß and Marco Dorigo</i>	
Deception in Ant Colony Optimization	118
<i>Christian Blum and Marco Dorigo</i>	
Evolution of Direct Communication for a <i>Swarm-bot</i> Performing Hole Avoidance	130
<i>Vito Trianni, Thomas H. Labella, and Marco Dorigo</i>	
Gathering Multiple Robotic A(ge)nts with Limited Sensing Capabilities . . .	142
<i>Noam Gordon, Israel A. Wagner, and Alfred M. Bruckstein</i>	

Improvements on Ant Routing for Sensor Networks 154
Ying Zhang, Lukas D. Kuhn, and Markus P.J. Fromherz

Integrating ACO and Constraint Propagation 166
Bernd Meyer and Andreas Ernst

Logistic Constraints on 3D Termite Construction 178
Dan Ladley and Seth Bullock

Modeling Ant Behavior Under a Variable Environment 190
*Karla Vittori, Jacques Gautrais, Aluizio F.R. Araújo,
Vincent Fourcassié, and Guy Theraulaz*

Multi-type Ant Colony: The Edge Disjoint Paths Problem 202
Ann Nowé, Katja Verbeeck, and Peter Vrančič

On the Design of ACO for the Biobjective Quadratic
Assignment Problem 214
Manuel López-Ibáñez, Luís Paquete, and Thomas Stützle

Reasons of ACO's Success in TSP 226
Oswaldo Gómez and Benjamín Barán

S-ACO: An Ant-Based Approach to Combinatorial Optimization
Under Uncertainty 238
Walter J. Gutjahr

Time-Scattered Heuristic for the Hardware Implementation
of Population-Based ACO 250
*Bernd Scheuermann, Michael Guntsch, Martin Middendorf,
and Hartmut Schmeck*

Short Papers

Ad Hoc Networking with Swarm Intelligence 262
*Chien-Chung Shen, Chaiporn Jaikaeo, Chavalit Srisathapornphat,
Zhuochuan Huang, and Sundaram Rajagopalan*

An Ant Colony Heuristic for the Design
of Two-Edge Connected Flow Networks 270
Efstathios Rappos and Eleni Hadjiconstantinou

An Experimental Analysis of Loop-Free Algorithms
for Scale-Free Networks 278
Shigeo Doi and Masayuki Yamamura

An Experimental Study of the Ant Colony System
for the Period Vehicle Routing Problem 286
Ana Cristina Matos and Rui Carvalho Oliveira

An Extension of Ant Colony System to Continuous Optimization Problems	294
<i>Seid H. Pourtakdoust and Hadi Nobahari</i>	
Ant Algorithms for Urban Waste Collection Routing	302
<i>Joaquín Bautista and Jordi Pereira</i>	
Ants Can Play Music	310
<i>Christelle Guéret, Nicolas Monmarché, and Mohamed Slimane</i>	
Backtracking Ant System for the Traveling Salesman Problem	318
<i>Sameh Al-Shihabi</i>	
Colored Ants for Distributed Simulations	326
<i>Cyrille Bertelle, Antoine Dutot, Frédéric Guinand, and Damien Olivier</i>	
Dynamic Routing in Mobile Wireless Networks Using ABC-AdHoc	334
<i>Bogdan Tatomir and Leon Rothkrantz</i>	
Fuzzy Ant Based Clustering	342
<i>Steven Schockaert, Martine De Cock, Chris Cornelis, and Etienne E. Kerre</i>	
How to Use Ants for Hierarchical Clustering	350
<i>Hanene Azzag, Christiane Guinot, and Gilles Venturini</i>	
Inversing Mechanical Parameters of Concrete Gravity Dams Using Ant Colony Optimization	358
<i>Mingjun Tian and Jing Zhou</i>	
Large Pheromones: A Case Study with Multi-agent Physical A*	366
<i>Ariel Felner, Yaron Shoshani, Israel A. Wagner, and Alfred M. Bruckstein</i>	
Near Parameter Free Ant Colony Optimisation	374
<i>Marcus Randall</i>	
Particle Swarm Optimization Algorithm for Permutation Flowshop Sequencing Problem	382
<i>M. Fatih Tasgetiren, Mehmet Sevkli, Yun-Chia Liang, and Gunes Gencyilmaz</i>	
Search Bias in Constructive Metaheuristics and Implications for Ant Colony Optimisation	390
<i>James Montgomery, Marcus Randall, and Tim Hendtlass</i>	
Task Oriented Functional Self-organization of Mobile Agents Team: Memory Optimization Based on Correlation Feature	398
<i>Sorinel Adrian Oprisan</i>	

Towards a Real Micro Robotic Swarm 406
Ramon Estaña, Marc Szymanski, Natalie Bender, and Jörg Seyfried

Posters

A Hybrid Ant Colony System Approach
for the Capacitated Vehicle Routing Problem 414
Lyamine Bouhafs, Amir Hajjam, and Abderrafiaa Koukam

A Swarm-Based Approach for Selection of Signal Plans
in Urban Scenarios 416
*Denise de Oliveira, Paulo Roberto Ferreira Jr., Ana L.C. Bazzan,
and Franziska Klügl*

Ant Colony Behaviour as Routing Mechanism to Provide Quality
of Service 418
*Liliana Carrillo, José L. Marzo, Lluís Fàbrega, Pere Vilà,
and Carles Guadall*

Applying Ant Colony Optimization
to the Capacitated Arc Routing Problem 420
*Karl F. Doerner, Richard F. Hartl, Vittorio Maniezzo,
and Marc Reimann*

Dynamic Optimization Through Continuous Interacting Ant Colony 422
Johann Dréo and Patrick Siarry

Dynamic Routing in Traffic Networks Using AntNet 424
Bogdan Tatomir, Ronald Kroon, and Leon Rothkrantz

First Competitive Ant Colony Scheme for the CARP 426
Philippe Lacomme, Christian Prins, and Alain Tanguy

Hypothesis Corroboration in Semantic Spaces with Swarming Agents 428
*Peter Weinstein, H. Van Dyke Parunak, Paul Chiusano,
and Sven Brueckner*

Mesh-Partitioning with the Multiple Ant-Colony Algorithm 430
Peter Korošec, Jurij Šilc, and Borut Robič

Author Index 433



<http://www.springer.com/978-3-540-22672-7>

Ant Colony Optimization and Swarm Intelligence
4th International Workshop, ANTS 2004, Brussels,
Belgium, September 5-8, 2004, Proceeding
Dorigo, M.; Birattari, M.; Blum, C.; Gambardella, L.M.;
Mondada, F.; Stützle, Th. (Eds.)
2004, XIV, 438 p., Softcover
ISBN: 978-3-540-22672-7