Contents

Full Papers

A Bearing-Only Pattern Formation Algorithm for Swarm Robotics ........ 3
Nicholi Shiell and Andrew Vardy

A Macroscopic Privacy Model for Heterogeneous Robot Swarms ........ 15
Amanda Prorok and Vijay Kumar

A New Continuous Model for Segregation Implemented and Analyzed on Swarm Robots ......................................................... 28
Benjamin Reh, Felix Aller, and Katja Mombaur

A Study of Archiving Strategies in Multi-objective PSO for Molecular Docking. ................................................................. 40
José García-Nieto, Esteban López-Camacho, María Jesús García Godoy, Antonio J. Nebro, Juan J. Durillo, and José F. Aldana-Montes

Ant Colony Optimisation-Based Classification Using Two-Dimensional Polygons. ................................................................. 53
Morten Goodwin and Anis Yazidi

Collective Perception of Environmental Features in a Robot Swarm ........ 65
Gabriele Valentini, Davide Brambilla, Heiko Hamann, and Marco Dorigo

Communication Diversity in Particle Swarm Optimizers. ....................... 77
Marcos Oliveira, Diego Pinheiro, Bruno Andrade, Carmelo Bastos-Filho, and Ronaldo Menezes

Continuous Time Gathering of Agents with Limited Visibility and Bearing-only Sensing. ........................................................ 89
Levi Itzhak Bellaiche and Alfred Bruckstein

Design and Analysis of Proximate Mechanisms for Cooperative Transport in Real Robots .......................................................... 101
Muhanad H. Mohammed Alkilabi, Aparajit Narayan, and Elio Tuci

Dynamic Task Partitioning for Foraging Robot Swarms ......................... 113
Edgar Buchanan, Andrew Pomfret, and Jon Timmis

Human-Robot Swarm Interaction with Limited Situational Awareness .... 125
Gabriel Kapellmann-Zafra, Nicole Salomons, Andreas Kolling, and Roderich Groß
Monotonicity in Ant Colony Classification Algorithms .......................... 137
James Brookhouse and Fernando E.B. Otero

Observing the Effects of Overdesign in the Automatic Design of Control Software for Robot Swarms ........................................ 149
Mauro Birattari, Brian Delhaisse, Gianpiero Francesca, and Yvon Kerdoncuff

Parameter Selection in Particle Swarm Optimisation from Stochastic Stability Analysis ........................................ 161
Adam Erskine, Thomas Joyce, and J. Michael Herrmann

Population Coding: A New Design Paradigm for Embodied Distributed Systems ........................................ 173
Heiko Hamann, Gabriele Valentini, and Marco Dorigo

Random Walks in Swarm Robotics: An Experiment with Kilobots ............. 185
Cristina Dimidov, Giuseppe Oriolo, and Vito Trianni

Synthesizing Rulesets for Programmable Robotic Self-assembly:
A Case Study Using Floating Miniaturized Robots ................................ 197
Bahar Haghighat, Brice Platerrier, Loic Waegeli, and Alcherio Martinoli

Using Ant Colony Optimization to Build Cluster-Based Classification Systems ........................................ 210
Khalid M. Salama and Ashraf M. Abdelbar

Short Papers

A Swarm Intelligence Approach in Undersampling Majority Class .......... 225
Haya Abdullah Alhakbani and Mohammad Majid al-Rifaie

Optimizing PolyACO Training with GPU-Based Parallelization ............ 233
Torry Tufteland, Guro Ødesneltvedt, and Morten Goodwin

Motion Reconstruction of Swarm-Like Self-organized Motor Bike Traffic from Public Videos ........................................ 241
Benjamin Reh and Katja Mombaur

On Heterogeneity in Foraging by Ant-Like Colony: How Local Affects Global and Vice Versa ........................................ 249
Yuichiro Sueoka, Kazuki Nakayama, Masato Ishikawa, Yasuhiro Sugimoto, and Koichi Osuka

On Stochastic Broadcast Control of Swarms .................................... 257
Ilana Segall and Alfred Bruckstein
Route Assignment for Autonomous Vehicles ................................. 265
   Nick Moran and Jordan Pollack

Stealing Items More Efficiently with Ants: A Swarm Intelligence
Approach to the Travelling Thief Problem ................................. 273
   Markus Wagner

Extended Abstracts

Achieving Synchronisation in Swarm Robotics: Applying Networked
Q-Learning to Production Line Automata .................................. 285
   Christopher Deeks

Autonomous Task Allocation for Swarm Robotic Systems
Using Hierarchical Strategy ...................................................... 287
   Yufei Wei, Toshiyuki Yasuda, and Kazuhiro Ohkura

Avoidance Strategies for Particle Swarm Optimisation in Power
Generation Scheduling ............................................................. 289
   Karl Mason, Jim Duggan, and Enda Howley

Clustering with the ACO Algorithm .......................................... 291
   Ashraf M. Abdelbar and Khalid M. Salama

Consideration Regarding the Reduction of Reality Gap in Evolutionary
Swarm Robotics ................................................................. 294
   Toshiyuki Yasuda, Motoaki Hiraga, Akitsoshi Adachi,
   and Kazuhiro Ohkura

Hybrid Deployment Algorithm of Swarm Robots for Wireless
Mesh Network ........................................................................... 296
   Kiyohiko Hattori, Naoki Tatebe, Toshinori Kagawa, Yasunori Owada,
   and Kiyoshi Hamaguchi

On the Definition of Self-organizing Systems: Relevance
of Positive/Negative Feedback and Fluctuations ........................ 298
   Yara Khaluf and Heiko Hamann

Particle Swarm Optimisation with Diversity Influenced Gradually
Increasing Neighbourhoods ....................................................... 300
   Karl Mason, Caitriona Kellehan, Jim Duggan, and Enda Howley

Author Index ............................................................................. 303
Swarm Intelligence
10th International Conference, ANTS 2016, Brussels, Belgium, September 7-9, 2016, Proceedings
Dorigo, M.; Birattari, M.; Li, X.; López-Ibáñez, M.; Ohkura, K.; Pinciroli, C.; Stützle, Th. (Eds.)
2016, XIII, 304 p. 105 illus., Softcover
ISBN: 978-3-319-44426-0