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Nota di contenuto	A Graph-Based Developmental Swarm Representation and Algorithm -- A Graph-Based Developmental Swarm Representation and Algorithm -- A Modified Particle Swarm Optimization Algorithm for the Best Low Multilinear Rank Approximation of Higher-Order Tensors -- A Robotic Validation of the Attractive Field Model: An Inter-disciplinary Model of Self-regulatory Social Systems -- A Thermodynamic Approach to the

Analysis of Multi-robot Cooperative Localization under Independent Errors -- An Alternative ACO Algorithm for Continuous Optimization Problems -- An Efficient Optimization Method for Revealing Local Optima of Projection Pursuit Indices -- Ant Colony Optimisation for Ligand Docking -- Antbots: A Feasible Visual Emulation of Pheromone Trails for Swarm Robots -- Automatic Configuration of Multi-Objective ACO Algorithms -- Autonomous Morphogenesis in Self-assembling Robots Using IR-Based Sensing and Local Communications -- Autonomous Multi-agent Cycle Based Patrolling -- Biologically Realistic Primitives for Engineered Morphogenesis -- Evaluating the Robustness of Activator-Inhibitor Models for Cluster Head Computation -- Evolution of Self-organised Path Formation in a Swarm of Robots -- Extensions to the Ant-Miner Classification Rule Discovery Algorithm -- Functional Blueprints: An Approach to Modularity in Grown Systems -- Heterogeneous Particle Swarm Optimization -- Modern Continuous Optimization Algorithms for Tuning Real and Integer Algorithm Parameters -- Multi-agent Deployment on a Ring Graph -- Multi-Swarm Optimization for Dynamic Combinatorial Problems: A Case Study on Dynamic Vehicle Routing Problem -- Off-line vs. On-line Tuning: A Study on Ant System for the TSP -- Opinion Dynamics for Decentralized Decision-Making in a Robot Swarm -- Positional Communication and Private Information in Honeybee Foraging Models -- Rank Based Particle Swarm Optimization -- Self-organized Task Partitioning in a Swarm of Robots -- Slime Mold Inspired Path Formation Protocol for Wireless Sensor Networks -- Solving the Multi-dimensional Multi-choice Knapsack Problem with the Help of Ants -- Theoretical Properties of Two ACO Approaches for the Traveling Salesman Problem -- Short Papers -- A Cooperative Network Game Efficiently Solved via an Ant Colony Optimization Approach -- A Deterministic Metaheuristic Approach Using “Logistic Ants” for Combinatorial Optimization -- A Model Based Ant Colony Design for the Protein Engineering Problem -- ACOPHY: A Simple and General Ant Colony Optimization Approach for Phylogenetic Tree Reconstruction -- ACS Searching for D 4t -Hadamard Matrices -- Ant Based Semi-supervised Classification -- Automatic Generation of Optimised Working Time Models in Personnel Planning -- Bee-Sensor: A Step Towards Meta-Routing Strategies in Hybrid Ad Hoc Networks -- Cooperation in a Heterogeneous Robot Swarm through Spatially Targeted Communication -- Early-Stage Diagnosis of Endogenous Diseases by Swarms of Nanobots: An Applicative Scenario -- EDA-PSO: A Hybrid Paradigm Combining Estimation of Distribution Algorithms and Particle Swarm Optimization -- Emergent Flocking with Low-End Swarm Robots -- Exploiting Loose Horizontal Coupling in Evolutionary Swarm Robotics -- Formal Verification of Probabilistic Swarm Behaviours -- Inverse Modeling in Geoenvironmental Engineering Using a Novel Particle Swarm Optimization Algorithm -- Mobile Stigmergic Markers for Navigation in a Heterogeneous Robotic Swarm -- Motif Finding Using Ant Colony Optimization -- Multiple Ant Colony System for Substructure Discovery -- Opportunistic Ant-Based Path Management for Wireless Mesh Networks.-Parallel Ant Colony Optimization Algorithm on a Multi-core Processor -- Particle Swarm Optimization in High Dimensional Spaces -- Particle Swarm Optimization of Bollinger Bands -- Protein Structure Prediction in Lattice Models with Particle Swarm Optimization -- Short and Robust Communication Paths in Dynamic Wireless Networks -- The ACO Encoding -- The Complexity of Grid Coverage by Swarm Robotics -- The Design of an Active Structural Vibration Reduction System Using a Modified Particle Swarm Optimization -- Extended Abstracts -- Ant Colony Extended: Search in Solution Spaces with a Countably Infinite

Number of Solutions -- Automatic Parameter Configuration of Particle Swarm Optimization by Classification of Function Features -- Constructing Low-Cost Swarm Robots That March in Column Formation -- Coordinating Heterogeneous Swarms through Minimal Communication among Homogeneous Sub-swarms -- Effect of Particle Initialization on the Performance of Particle Swarm Niching Algorithms -- Energy Efficient Swarm Deployment for Search in Unknown Environments -- Genetic Encoding of Robot Metamorphosis: How to Evolve a Glider with a Genetic Regulatory Network -- How Ant Systems Can Help in Management of pH for Industrial Wastewater Discharges -- Hybrid Metaheuristic Combining Ant Colony Optimization and H-Method -- Increasing Individual Density Reduces Extra-Variance in Swarm Intelligence -- “Look out!”: Socially-Mediated Obstacle Avoidance in Collective Transport -- On Possible Connections between Ant Algorithms and Random Matrix Theory -- Soft Variable Fixing in Path Relinking: An Application to ACO Codes -- Training Randomly Connected, Recurrent Artificial Neural Networks Using PSO.

Sommario/riassunto

These proceedings contain the papers presented at ANTS 2010, the 7th Int- national Conference on Swarm Intelligence, organized by IRIDIA, CoDE, U- versiteLibre de Bruxelles,Brussels, Belgium, during September 8-10,2010.The ANTS series started in 1998 with the First International Workshop on Ant Colony Optimization (ANTS 1998), which attracted more than 50 participants. Since then ANTS, which is held bi-annually, has gradually become an inter- tional forum for researchers in the wider ?eld of swarm intelligence. In the past (since 2004), this development has been acknowledged by the inclusion of the term" SwarmIntelligence" (nextto"AntColonyOptimization")intheconference title. This year's ANTS conference was o'cially devoted to the ?eld of swarm intelligence as a whole, without any bias towards speci'c research directions. As a result, the title of the conference was changed to "The International Conf- ence on SwarmIntelligence." This name change is already in place this year,and future ANTS conferences will continue to use the new title. Thisvolumecontainsthebestpapersselectedoutof99submissions.Ofthese, 28 were accepted as full-length papers, while 27 were accepted as short papers. This corresponds to an overall acceptance rate of 56%. Also included in this volume are 14 extended abstracts. Of the full-length papers, 15 were selected for oral presentation at the c- ference. All other contributions, including short papers and extended abstracts, werepresentedin the formof poster presentations.Following the conference,the journal Swarm Intelligence will publish extended versions of some of the best papers presented at the conference.