Journal of Theoretical and Computational Science

OPEN ACCESS Freely available online

Editorial Note

Subsequent Visualizing in Swarm Robotics

Ashra Tolba

Department of Computer Science and Engineering, Ain Shams University, Egypt

ABSTRACT

Our high-level conferences will bring together forward thinking brands, market leaders, AI & Swarm intelligence evangelists and hot start-ups to explore and debate the advancements in Artificial Intelligence & Swarm intelligence, the impacts within Enterprise & Consumer sectors as well as Development platforms and Digital Transformation opportunities. Topics covered include Business Intelligence, Deep Learning, Machine Learning, AI Algorithms, Data & Analytics, Virtual Assistants & Catboats as well as case study based presentations proving an insight into the deployment of AI across different verticals.

On behalf of the International Journal of Swarm Intelligence and Evolutionary Computation I am gratified to present the journal. Our articles AI & Swarm intelligence is the latest trending technology in many fields especially in industries like Manufacturing, Automation, Control Systems, Healthcare, Energy, Transport, Defence, Space, Data Mining, etc. Artificial Intelligence will be a common platform to gain knowledge and share new ideas amongst the Technologist, Professionals, Industrialists, Researchers, Innovators and students from research area of Machine Learning. Experts will share their research experiences and engage in many interactive discussions at the event.

include review, research, short communication, short commentary, full length articles etc. Our Journal is running successfully since 2012 with the encouragement and inspiration of readers, researchers and editorial board members. The achievement is due to the support given by Editorial board members, researchers, authors and readers.

Keywords: Artificial Intelligence; Swarm intelligence; Technologist; Swarm intelligence

INTRODUCTION

Swarm Robotics is the study of designing a group of robots that operate without relying on any external infrastructure or on any form of centralized control. A robotic swarm results in the collective behavior of the robots from local interactions between the robots and between the robots and the environment in which they act. Here multiple robots collectively solve problems by forming advantageous structures and behaviors similar to the ones observed in natural systems like swarms of bees, birds, or fish.

It is the use of numerous, autonomous robotics to accomplish a task. Robot swarms coordinate the behaviour of a large number of relatively simple robots in a decentralized manner. Swarm robotics plays a wide role in the development of collective artificial intelligence (AI). Current uses for robot swarms include search and rescue, precision agriculture, supply chain management (SCM) and military reconnaissance.

INSIGHT OF SWARM ROBOTICs

Swarm robotics attempts to draw on the ways social organisms, such as insects, use collaborative behaviors to achieve complex tasks beyond any individual's capability. For example, researchers in swarm robotics might study how bees mark trails with pheromones to map geographical locations. The researchers might then use the bee's algorithms to replicate that same behavior with robots.

Swarm robotics has its origins in swarm intelligence and is also defined as "embodied swarm intelligence". The main focus of swarm robotics research is to study and validate biological research. Early collaboration between roboticists and biologists helped reboot swarm robotics research, which has become a research field in its own right. In recent years, the focus of swarm robotics has been shifting from a bio-inspired field of robotics. Swarm Robotics is eventually becoming an engineering field whose focus is on the development of tools and methods to solve real problems[1-5].

Swarm robotics promotes the development of systems that are able to make the grade with the failure of one or more of their constituent robots. The loss of individual robots does not imply the failure of the whole swarm. Fault tolerance is enabled by the high redundancy of the swarm and the swarm does not rely on any centralized control entity, leaders, or any individual robot playing a predefined role.

Correspondence to: Ashra Tolba, Department of Computer Science and Engineering, Ain Shams University, Egypt; Email: Ashratolba@yahoo.com
Received: September 04, 2020; **Accepted:** September 17, 2020; **Published:** September 24, 2020

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Self-healing allows the swarm to recover from faults caused by deficiencies of individual robots. The goal is thus to minimize the impact of robot failure on the rest of the swarm to increase its reliability, robustness, and performance. Self-reproduction allows a swarm of robots either to create new robots or replicate the pattern created from many individuals. The goal is to increase the autonomy of the swarm by eliminating the need of a human engineer to create new robots. Human-swarm interaction allows humans to control the robots in the swarm or receive information from them.

REFERENCES

1. Xuan Q, Li Y, Wu TJ. Optimal symmetric networks in terms of minimizing average shortest path length and their sub-optimal growth model. Physica A: Statistical Mechanics and its Applications. 2009;388:1257-1267.
2. Wang S, Gong M, Du H, Ma L, Miao Q, Du W. Optimizing dynamical changes of structural balance in signed network based on memetic algorithm. Social Networks. 2016;44: 64-73.
3. Du H, Fan J, He X, Feldman MW. A Genetic Simulated Annealing Algorithm to Optimize the Small-World Network Generating Process. Complexity. 2018.
4. Peng J, Xu G. Average path length for Sierpinski pentagon. arXiv preprint arXiv:1112.4943. 2011.
5. Du H, Wang J, He X, Du W. A memetic algorithm to optimize critical diameter. Swarm Evol Comput. 2019; 47: 56-65.