Summary of Pattern Formation for Asynchronous Robots without Agreement in Chirality

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Introduction

This paper explores the collaborative tasks of autonomous mobile robots, focusing on a deterministic algorithm to arrange them into specific asymmetric patterns without explicit communication or agreement in coordinate systems.

Methods

The study utilizes the CORDA model to design an algorithm that allows point robots to establish a common coordinate system and subsequently move to form the intended pattern by executing a series of deterministic movement strategies.

Results

The proposed algorithm effectively demonstrates that robots can form any specified asymmetric pattern in finite time while ensuring collision-free movements and maintaining an invariant coordinate system throughout the process.

Discussion

The findings indicate that even in the absence of agreement in chirality or coordinate systems, a distributed approach can lead to successful pattern formation, thereby enhancing the potential applications of swarms of autonomous robots in various environments.

Conclusion

The algorithms developed not only achieve the formation of asymmetric patterns but can also be extended for use with fat robots, suggesting a promising avenue for future research in robotic coordination and pattern formation.