solute **algorithm** application approach **area** become
communicate compare define **distributed** exception finally form general give
en great **information** intelligence knowledge large **location**

Robotic Swarms
Distributed Coordination Without Location

S.J.A. Bekhoven, S.P. Metman, M.J. Rogalla, EEMCS
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disturbance dynamic exact example follower **formation**
leader leaderfollower local location **locationfree**
performance problem provide rangebased **robot**
structure swarm system teamwork used **virtual**

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Outline

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Introduction

- What are Robotic Swarms?
- Why did we write this paper?
- How did we achieve this?

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Swarm Definition

- Scalable Network of Robots
- More than 2 Robots
- Distributed Intelligence

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Location & Range

Location-free

Robots have no knowledge of their absolute location but may keep track of their relative location.

Location-based

Robots have perfect knowledge of their absolute location.

Range-free

Robots do not communicate or communicate via some kind of central base.

Range-based

Robots communicate within predetermined range.

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Performance& Scalability

Performance

> The general efficiency, which is defined differently per problem.

Scalability

> The ability of maintaining performance when the population in the robot swarm is increased.

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Main Problems vs. Composite Problem
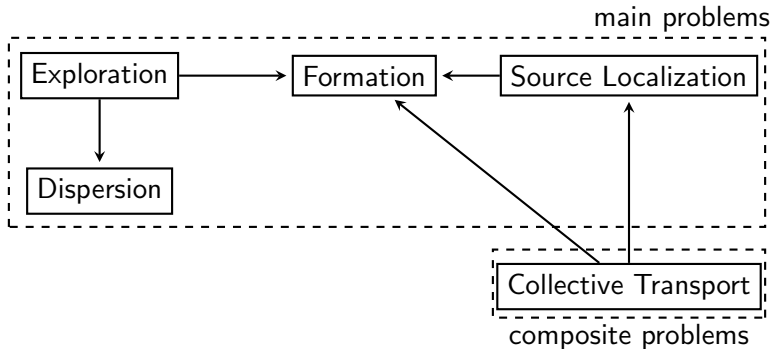
Figure : Problem Composition Overview

Formation

Next Subsection

Formation

Dispersion

Exploration

Source-localization

Next Subsection

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Collective-transport

Discussion