

Problem Statement for Research Project

Swarm robotics is a field in robotics where a large number of simple robots form a swarm capable of completing complex tasks through intercommunication and interaction with the environment. Many of the approaches to swarm behaviours are inspired by natural organisms such as ants, termites, etc.

Estimating all the possible desired and undesired behaviors of the swarm as a system, based solely on the behavior defined for a single robot, is challenging. Consequently, verifying the correctness and safety of the system becomes even more difficult.

I propose conducting a review of recent research in the field of swarm robotics to analyse approaches to defining swarm behaviours. Additionally, I suggest modelling the described swarm behaviours in an integrated environment for modelling - \bigcup_{PPAAL} , to understand the implications of mutual interactions of unit robots on the behaviour of the whole system.