PROJECT OVERVIEW

Insects are small organisms with brains and simple minds. Each insect is only able to do a simple task with its mind and body. However, each of these simple tasks as a whole can contribute to a very complex task. This is the wonderful power of insects. Ants, being one species of these tiny organisms, are able to build a big and well structured underground city. This shows how powerful they are.

What is the magic underneath? There is no central organizer among them, or even a well organized plan in their mind. The magic is just a simple working principle. By following the principle, a swarm of these organisms works together and finishes a very complex task.

In this project, mobile robots are built in order to figure out the simplest working principle for a specific complex task.

The targeted complex task is the emergence of a particular structure through the work of mobile robots. The programmed mobile robots, following the working principle, rearrange the randomly distributed and uniformly sized elements into order, which contributes to a connected hexagon structure figuration.
The Working Principle for the robots:

Step 1) The robot moves around the working platform.

Step 2) The robot stops moving when it experiences valid disc detection.

Step 3a) For the robot which has been bringing a disc, it puts down the taken disc. Then repeats step 1)

Step 3b) For the robot which is not bringing a disc, it picks up the detected disc. Then repeats step 1)
CIRCUIT SCHEMATIC

EMERGENCE of TRIANGULAR STRUCTURE

R: ROBOT

BUILDING ELEMENTS