MASTER-SLAVE BEHAVIOR OF ROBOTS (LEGO NXT)

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Article delas about the collective behavior of robots. The aim is to create a robots with a modular robotic system, LEGO Mindstorm NXT and validate its use in the field of collective behavior of robots. Communication, which is ensured by Bluetooth technology, is bidirectional, both robots send and receive messages.

The MASTER robot consists of one NXT brick, two gyroscopic sensors and two pressure sensors. Gyroscopic sensors record two movements: frot-back, left-right. SLAVE robot uses one brick NXT, two motors and one ultrasonic sensor.

MASTER and SLAVE robots have been programmed in the BrixCC tool. The verify process of the solution functionality revealed several shortcomings (Mindstorm NXT LEGO), which limit their use in the field of collective behavior of robots.

The communication works well for a distance of several meters, but if the distance among robots is over 2 meters, robots cannot communicate .

Lego NXT Mindstor can be easily used for simulating of the insects behavior (eg ants, in search of food or in defense of the territory). The robots would use a compass and an accelerometer (to detect direction of motion, speed and movement time). The work area has to be large enough (large robots workspace), but also small enough (limitation of bluetooth communication).

Video: http://www.youtube.com/watch?v=I85YVzk-Q2g

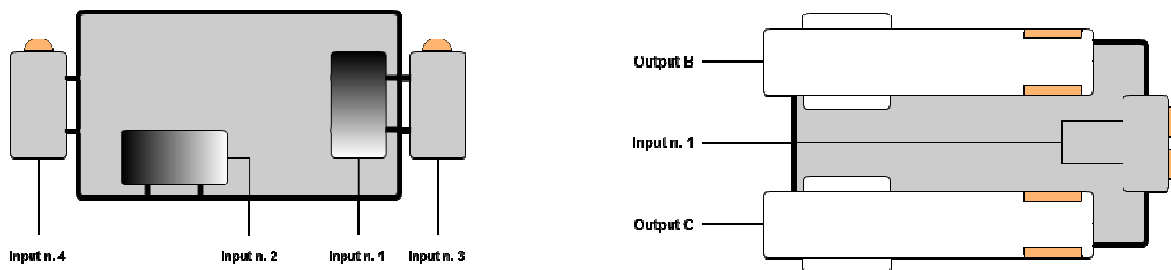**Keywords**: collective behavior of robots, Lego Mindstorm NXT, insects behavior

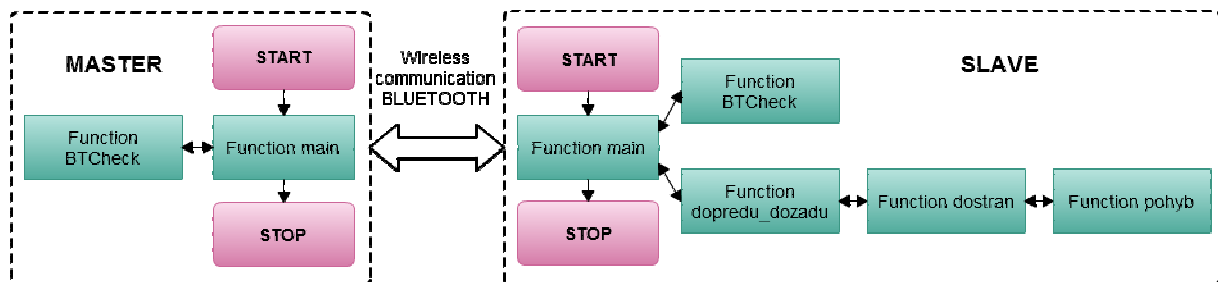*Fig. 1: Composition of MASTER (left), SLAVE (right)*

Fig. 2: Relationship between MASTER and SLAVE blocks and their internal structure